

**MACQUARIE UNIVERSITY
DEPARTMENT OF EARTH AND PLANETARY SCIENCES**

**GEOS251
Minerals, Energy and Environment
GEOS803
Minerals, Energy in a global Environment
2011 X1, External Offering**

This is a general education unit that introduces students to the technical, social, economic and environmental aspects that lie behind the production and use of mineral and energy resources in Australia and the rest of the world. The end products of these resources are familiar to us as steel for cars, aluminium for pots and pans, crude oil for petrol and coal for electricity. Nowadays, we have to consider acid rain, the greenhouse effect, heavy metal pollution, oil spills, radiation, land degradation and land rights. Scarcity and resource exhaustion are also concerns.

The aim of GEOS251/GEOS803 is to introduce students to the many and varied aspects that underlie the supply and utilisation of the more common mineral and energy resources. We demand and accept the goods and services provided by the minerals industries, including the increased wealth resulting from mineral exports, yet increasingly oppose the development of the resources that produce these goods. We expect to have these goods and services available to use, yet often oppose the development of the basic resources that are essential for the provision of these goods. This does not mean that opposition to development is bad, or that development is good. What it does mean is that it is important to look at the broader picture rather than concentrate on a particular, narrow facet of the 'non renewable' resource industries. This includes the man-made interrelated aspects of resource availability and alternatives, consumption patterns, environmental impacts, and government policies and constraints. The unit aims at providing a better understanding and appreciation of these factors and their relative importance.

At the same time, in this unit you will refine your general skills, namely presentation skills, report writing and research using a variety of sources to gain a balanced view on controversial issues.

It is IMPORTANT that you read through the whole unit of study booklet. It contains most information needed for this unit and should answer questions regarding set-up of the unit, content, assessment etc. This unit of study booklet is divided into three sections:

Part I Unit Outline

- (1) lecture schedule and important dates
- (2) introduction to the unit, set-up etc.
- (3) details of assessment
- (4) formatting required for assignments

Part II Assignments

You are expected to be working slowly through the assignments throughout the *whole* semester – they are relatively very large assignments – do not leave it to the last minute!

Part III Appendices

- Appendix 1 – How to give a presentation
- Appendix 2 – Texts and References
- Appendix 3 – Writing hints: Writing Tips, How to overcome Writers Block, Presentation of Assignment
- Appendix 4 - Plagiarism & Correct citation styles
- Appendix 5 – Example Exam

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Unit of Study Booklet – Part I

Unit Outline

(1) LECTURE/QUIZ/ASSIGNMENT SCHEDULE

Week Mo. date	Lecture A	Lecture B	Quiz/Assignment
Week 1 21/2	Lect 1: Introduction	Lect 2: Global Mining Industry I	
Week 2 28/2	Lect 3: Global Mining Industry II	Lect 4: Supply and Demand of Mineral Resources	Quiz 1 (material from Lect1-4)
Week 3 07/3	Lect 5: Mining and Process technology		<i>Assignment 1 Due</i>
Week 4 14/3	Lect 6: Metals and industrial minerals	Watch Presentations (Assignment) of Fellow Students	
Week 5 21/3	Lect 7: Mining and Environment		Quiz 2 (material from Lect5-7 & Student Presentations)
Week 6 28/3	Lect 8: Conversion of Energy	Lect 9: Coal	
Week 7 04/4	Lect 10: Uranium	Lect 11: Oil and Gas	Quiz 3 (material from Lect8-11)
Break:11/4-26/4.			
Week 8 27/4	Lect 12: Supply, Demand, Energy	Lect 13: Air pollution	<i>Assignment 2 Due</i>
Week 9 02/5	Lect 14: Scarcity	Lect 15: Mining and Society	Quiz 4 (material from Lect12-15)
Week 10 09/5	Lect 16: Climate change	Lect 17: Alternative Energy I	
Week 11 16/5	Lect 18: Alternative Energy II	Lect 19: Mineral Resources, Land Use and Native title	Quiz 5 (material from Lect16-19)
Week 12 23/5	Lect 20: Sustainable development I	Lect 21: Sustainable development II	<i>Assignment 3 Due</i>
Week 13 30/5	No lectures		Assignment 4 Due (GEOS803 only)

IMPORTANT DATES:

Week 3– Thursday 10/3 5pm: Assignment 1 is due

Week 8– Thursday 28/4 5pm: Assignment 2 is due

Week 12 – Thursday 26/5 5pm: Assignment 3 is due

Week 13– Thursday 2/6 5pm: Assignment 4 is due (GEOS 803 only)

Exam: To be advised once the examinations timetable is drawn up (Exam period 6/6-24/6)

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FACULTY OF SCIENCE**

**GEOS251
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Minerals, Energy in a global Environment
Unit Outline – Semester 1, 2011 –External**

Unit Coordinator: Dr Sandra Piazoło

Ph: 9850-4407
sandra.piazoło@geo.su.se

Credit Points: Room 425, E7A
3 (GEOS251), 4 (GEOS803)

Contact hours: after appointment with unit coordinator
Any correspondence or enquiries relating to the unit, which require a return contact, must be accompanied by an appropriate telephone number, contact time range and address.

Pre-requisites: 12cp

Website: <http://learn.mq.edu.au/>

INTRODUCTION

KEY LEARNING OBJECTIVES

There are five main objectives in this unit:

- To gain an appreciation of the importance of the mining/resource industry in Australia, its impact on society and environment.
- To gain a knowledge of the use of the most important metals and industrial minerals and their processing technology
- To gain an appreciation of the possible and actual conflicts that mining may cause with society
- To understand the current challenges of society in terms of energy demand, minerals and metals demand, environment and sustainability
- To further develop skills in independent research using a variety of sources including the internet, and written and oral presentation skills of scientific information.

STUDENT LEARNING EXPERIENCES

The University expects you to spend about 9 hours per week on a 3 c.p. unit (12 hours for the 4 c.p. GEOS803).

Each week students will be required to:

- 1) Watch/Listen to one to two lectures downloaded (powerpoint presentation and audiofiles will be available from Blackboard – the lectures for each week will be available on Monday 9 am that week)
- 2) Read up on the material covered in the lectures using the internet and sources given in this booklet (Appendix 2).

Note: There are **no on-campus sessions**.

Each fortnight [two weeks] each student will be required to:

- 1) Take a 20-minute online quiz [These will consist of multiple choice, true-false, matching game, one word answer style questions and be open book - there will be 5 over the semester. The questions will be drawn mainly from the lectures. These will only be available for two weeks each, i.e. if you miss one – you get zero for that quiz.]

Over the semester each student will be required to:

- 1) Complete one small research assignment
- 2) Complete two more substantial research assignments
(Note for GEOS 803: there are 3 substantial assignments)
- 3) Sit a final 2 hr exam

The specific topics and principal dates are listed in the Schedule on the first page of the unit outline.

The information given in this Unit Outline is supported and supplemented by material on the on-line Blackboard.

The Blackboard includes:

1. Unit Outline
2. Lecture-Quiz-Assignment Timetable
3. Lecture presentations and audio files
3. Fortnightly Quizzes
4. Assignment Outlines and Resources
5. Links to Assignment 1 presentations of fellow students
- 6.. Assignment Coversheet Declaration
(note specific to assignment no.)
7. Example exam
7. Unit Coordinator Contact Details

If you have any problems accessing the web site or any questions regarding administrative matters, including those related to enrolment, assignments, marks, grades and the exam, please contact the unit convenor:

PLEASE NOTE: The lectures are in part given specific for this year (2011, given by Sandra Piazzolo) and some are lectures that have been recorded in 2007 for a similar course. The latter (2007 lectures) are explicitly marked as such. Please do not pay any attention with regard to references to assignments – deadlines etc. given during the 2007 recordings.

ASSESSMENT

The assessment consists of several components, listed below. A satisfactory standard is required in all components.

GEOS 251	<i>Fortnightly quiz</i>	10% (2% each)
	<i>Assignments</i>	40% (10% assignment 1, 15 % assignment 2 and 3 each)
	<i>Final examinations</i>	50%
GEOS 803	<i>Fortnightly quiz</i>	10% (2% each)
	<i>Assignments</i>	40% (5% assignment 1; 10 % assignment 2, 3; 15 % assignment 4)
	<i>Final examinations</i>	50%

Formal assessment tasks comprise the fortnightly quizzes, three (four for GEOS803) research assignments, and the final examination. Whereas information may be shared when preparing for these tasks, the tasks themselves should be the work of each individual. Referenced statements that indicate the sources (whether from written or electronic material or from other students) are acceptable. Please use the referencing style outlined in appendix 4.

All assignments must be completed and submitted, regardless of possible grade, for a student to pass the unit.

The final examination will cover all aspects dealt with in the unit. **Attendance at the examination and a passing mark is compulsory in order to pass the unit.** The examination will test your knowledge of the general issues covered in all areas of the unit. The questions will include one part about concepts, processes, the meaning of terms, etc., and another part where you need to write a short essay similar to the assignment essays. Students are not permitted to retain the examination papers so there is no 'Examination case history' available. However, a sample exam (Appendix 5) is provided in the appendix to give you a good idea of what to expect.

ASSESSMENT TASKS

The dates for submission of assessment tasks are listed on the first page of the unit outline.

Extensions for submission of assessment tasks will be given only for illness or misadventure, which must be supported by documentation and a written request. This request should also indicate the extension period required. Assessment tasks submitted late without approval will be penalized 10% of the potential total mark per day late, excluding weekends. Students must keep a photocopy of their reports.

Queries, appeals and special consideration

In the first instance, contact the unit convenor if there are any questions about the assessment tasks themselves, or about the comments and grades that you receive for your assignments. You are permitted to appeal against your final grade in any of your units. Before initiating an appeal, discuss your unit grade fully with the unit convenor. More details of the Faculty of Sciences' appeals procedures

are available in the Science Centre, ground floor E7A (phone: 9850 6000). The University's special consideration policy can be found at: http://mq.edu.au/policy/docs/special_consideration/policy.pdf

Feedback

Feedback on assessment tasks is given in this unit in the following ways:

- 1) The primary mode of assessment feedback: the assessment marker will present overall feedback to the class posted on blackboard two weeks after the submission date of the specific assignment on what aspects of the assignment were done best and where improvement is needed in general.
- 2) You will be provided with some written feedback on the assignment indicating where you could improve.
- 2) Students are encouraged to seek further feedback (by seeking direct contact with the assessment marker) if they are unsure of any aspect of the feedback or if they want further feedback.
- 3) We provide you with assignment cover pages on Blackboard that have a breakdown of the marks awarded for each component. Scoring full marks for a given component indicates that you did exceptionally well. Alternatively, scoring poorly in a component strongly suggests it required further work.

EVALUATION

We are interested in your ideas about how the unit is progressing and how it can be improved. If you have any particular comments (good and bad) or ideas on how to make the unit better please let the unit convenor know. There have been many changes made to previous offerings of units over the past few years based on student feedback. For example, we now introduced the online quizzes following feedback from students who requested a more structured guide to their at home study time. Most students find this very useful as it makes them read up on and learn the lectures content. In addition, the lecture notes are now in a format where black and white printing will show all needed material.

Good studying and much success !!

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Unit of Study Booklet – Part II

Assignments

Assignments

Assignment 1 – The composition of an everyday article: Origin and Issues

Assignment 2 – Uranium: Mining and Nuclear Waste Disposal

Assignment 3 – Carbon Capture and Storage – Australia's role in combating Global Warming

Assignment 4 – Journal and Precis (GEOS803 students only)

Assignments:

There will be three assignments throughout the semester (four for GEOS803 students)

Assignment	Topic	Due Date
1	The composition of an everyday article: Origin and Issues	10/3
2	Uranium: Mining and Nuclear Waste Disposal	28/4
3	Carbon Capture and Storage – Australia's role in combating Global Warming	26/5
4	Journal and Precis	02/6

General information on Assignments

Assignment 1:

This assignment will be smaller than the other assignments. Its aim is to a) get you to use the internet to acquire knowledge and insight, b) summarize this comprehensively and c) present it in a short 3 minute presentation.

Assignment 2 and 3:

Each will have the form of a small research project. Each project will run over approximately 3 weeks. Each assignment will include two parts:

(a) a research component (65%)

(b) an individual component, in which you will be asked to present and justify your personal views on the topic (35%).

The two projects will be on controversial topics related to the minerals and energy industries, about which you may have strong views. Despite this, it is important that your assignments are balanced and present dispassionately both sides of the issues. When asked for your own views, you must support your position with well-reasoned argument. **A one-sided rant will not score highly.**

It is quite likely that students in the unit will have widely differing views on the questions posed for the individual component. Again, provided that you support your views with dispassionate, well reasoned arguments, this is fine.

Journal and Precis (GEOS803 students only)

The purpose of this exercise is to allow you to develop an appreciation of the key **topical** issues associated with the development and performance of the minerals and energy industries and for you to document the evolution of these issues in the context of the wider public debate.

All assignments **must include** a signed copy of the **Assignment Coversheet Declaration** (available from Blackboard – note these are DIFFERENT for each assignment). Written parts of assignments must be submitted in a common font (Times/Arial/Helvetica) with a font of 12. Submitting more pages than asked for will result in a lower score (Note: reference list is not included in the page No., i.e. if asked to submit a one page summary, you are allowed to submit 1 page text and another page of Reference list).

Advice on writing, referencing and the important issue of **Plagiarism** are given in the Appendices 3 & 4.

Assignments should be submitted to the **Centre for Open Education** by 5pm on the due date or sent directly to me as e-mail attachments (sandra.piazolo@mq.edu.au) (MS Word, avi, mov files or pdf files only) by 5pm on the due date.

Assignment 1

This assignment will be smaller than the other assignments. Its aim is to a) get you to use the internet to acquire knowledge and insight, b) summarize this comprehensively and c) present it in a short 3 minute presentation.

Topic: The composition of an everyday article: Origin and Issues

Remember the aim of this unit: *"This is a general education unit that introduces students to the technical, social, economic and environmental aspects that lie behind the production and use of mineral and energy resources in Australia and the rest of the world. The end products of these resources are familiar to us as steel for cars, aluminium for pots and pans, crude oil for petrol and coal for electricity. Nowadays, we have to consider acid rain, the greenhouse effect, heavy metal pollution, oil spills, radiation, land degradation and land rights. Scarcity and resource exhaustion are also concerns."*

This assignment is designed to lead you into the main themes of the unit by asking you to investigate into the significance of metals, energy and minerals in our everyday life. You are asked to look into the make-up of an everyday article e.g car (or specific parts of these), bicycle, scooter, refrigerator, airconditioning system, fan, oven, cutlery, pots, washing machine, watches, mobile phones, computers (or parts of those), paint etc. and look into 2 of the main minerals/metals/resources used for this article, their production, environmental issues with their production etc.

You will need to write a short summary of your findings, and produce a short 3-5 min. presentation. This presentation (audiofile and separate ppt file) will be made available to everybody in the class and form part of the "lectures" i.e. information given in this unit. In addition, normally when you view other presentation you learn a lot of how to do a presentation by seeing yourself what worked and did not work.

There are two parts that need to be submitted for this assignment

Part 1: Short summary of your findings (1 page maximum), including the following

- a) present the everyday article you decided to concentrate on
- b) summary of main resources used to manufacture the article including minerals, metals, energy required to produce the article
- c) concentrate on 2 of the main minerals/metals/resources used for the article – give the main world suppliers (countries) of this mineral/metal, their history price development, and issues with the environmental and/or societal impact associated with the mining of the resource you have identified

Part 2:

- a) Prepare a powerpoint presentation maximum of 5 slides (to be submitted)
- b) record a short 3 minute presentation of your findings (video or audiofile with specific reference to slide no. of your presentation with home video/camera/phone). Be sure to adhere to suggestions (size, clarity etc) in the "How to give a presentation" (Appendix 1). Your presentation will be made available to your fellow students to view and content will be tested in the online quiz No. 2

Due Date: Thursday 10/3 2011

Assignment 2

Uranium Mining and Nuclear Waste Disposal

Australia has the largest reserves of uranium of any country in the world. Australia is the second largest exporter of uranium with annual export income of more than 990 million dollars. However, despite the considerable economic benefits of mining and exporting uranium, any new mine proposal is met with fierce public opposition.

A permanent repository for nuclear waste has yet to be built on any continent, but the quantity of nuclear waste from power-generating facilities continues to increase.

For example, Europe is intensifying its search for a feasible underground storage sites for nuclear waste. France, along with Britain, Japan and Russia, currently reprocess their nuclear waste and then hold it in an interim storage facility. Germany is also in need of a permanent way of storing nuclear waste (See link below).

<http://www.spiegel.de/international/germany/0,1518,672147,00.html>

In 1971 a salt mine in Morsleben, Germany was chosen as repository for nuclear waste. However, storage of nuclear waste was terminated in 1998 after problems with the geological structure of the salt dome.

The United States is also still struggling to find a suitable place for its accumulating nuclear waste (see link below).

<http://www.nytimes.com/2009/03/06/science/earth/06yucca.html>

While Australia does not use any uranium for power generation and thus produces no high-level radioactive waste, the possibility of building a repository for global high-level nuclear waste in a remote area of Western Australia, the so-called Pangea Concept, was proposed in 2001. While its major proponent, Pangea Resources International, a multinational company, ceased operations in 2001 its key players have established ARIUS, an Association for Regional and International Underground Storage". Some people argue that, since Australians are prepared to enjoy the economic benefits of exporting uranium, we should also be prepared to take responsibility for some its wastes. This issue has recently been in the news again as the discussion on a suitable location in Australia continues (See for example articles in The Sydney Morning Herald)

You are asked to consider the advantages and disadvantages of uranium mining and of building a repository for global high level nuclear waste in Australia.

Research Component (65%)

In no more than 1 page per part, you are asked to:

- Describe and briefly evaluate the benefits and costs to Australia of uranium mining.
- Explain why Western Australia is considered a prime location for establishing a high-level nuclear waste repository.
- Outline the potential benefits of building such a repository.
- Outline the potential problems of building such a repository.

Individual Component (35%)

As an individual, you are asked to respond to the following (max 1 page per part):

- In your opinion, should Australia allow mining of its uranium deposits? If so, under what conditions? Justify your answer.
- Discuss whether you would support building of a high-level waste repository facility in Australia, giving reasons for, and reservations in, your answer.
- If you are in favour of building such a repository, explain how you would go about selling the idea to the Australian public and government; if not, offer your preferred solution to the issue of global nuclear waste

A brief introduction to the assignment and summary are also expected. Accurate referencing of all sources of information is essential.

Due Date: Thursday 28/4 2011

Material (to start with)

Texts from Resources (Blackboard)

- *Outlook for the uranium industry*
- *Pangea Technical report*

Useful webpages

- World Nuclear Association: <http://world-nuclear.org/info/inf48.html>
- Australian Government (2010) "Radioactive Waste Management"
<http://www.arpsa.gov.au/radiationprotection/factsheets/is>
- Leslie Lai and Kristen Morrison(2008) "Nuclear Age Peace Foundation", "Nuclear Energy Fact Sheet".
<http://www.wagingpeace.org/menu/issues/nuclear-energy-&-waste/nuclear-energy-fact-sheet.htm>

Assignment 3

Carbon Capture and Storage – Australia’s role in combating Global Warming

Many people consider that global warming, caused primarily by increased atmospheric carbon dioxide (CO₂) concentrations from burning fossil fuels, could have catastrophic effects. Possible outcomes are:

- increased global temperatures, resulting in destruction of ecosystems and spread of tropical diseases
- higher incidence of droughts, floods and severe storms, and associated crop failures, starvation and deaths
- melting of polar ice caps, resulting in rising sea level, and inundation and displacement of low-lying communities; e.g., Sydney!
- possible changes in oceanic circulation patterns, which could potentially cause sudden drastic changes in climate.

Australia is one of the highest per-capita energy consuming countries in the world. Australia is also almost unique in deriving a large majority of its electrical energy from burning coal, the most CO₂-intensive fuel that exists.

Energy and Industrial Processes contributed to almost three-quarters of Australia's total net greenhouse gas (GHG) emissions in 2006 and 2007. Coal contributed to about 37% of these. See table below.

1. Broad sector contributions (CO ₂ -e)	2006	2007	2006	2007
Sector	(000 tonnes)	(000 tonnes)	% of Natnl	% of Natnl
1. Energy	400,104	408,163	67.1	68.4
2. Industrial Processes	29,387	30,343	4.9	5.1
Total - of which:	429,490	438,506	72.0	73.4
Coal (see Table 2.)	218,080	220,243	36.6	36.9
Other fuels	211,411	218,263	35.4	36.6
3. Agriculture	90,798	88,106	15.2	14.8
4. Land Use, Land-Use Change and Forestry	61,669	55,978	10.3	9.4
5. Waste	14,182	14,567	2.4	2.4
Total Net National GHG Emissions	596,140	597,157	100.0	100.0

From: Australian Coal Association

One technically possible way of substantially reducing GHG emissions from coal-fired power stations would be to capture the CO₂, compress it and transport it by pipeline and/or ship to a secure storage location. Capture of the CO₂ can in principle be done in two different ways:

- after the gas turbine ‘cycle’ in a power station; or
- after fuel combustion in a conventional (pulverised coal or natural gas) power station, by extraction of CO₂ from flue (exhaust) gas as it passes up the chimneys.

The main option for storage of CO₂ from a large point source such as a power station is deep underground, either in depleted oil and gas fields, or in un-minable coal mines or in saline aquifers located in sedimentary rocks.

The International Energy Agency (IEA) GHG 2008 report estimates that global Carbon Capture and Storage (CCS) in electricity generation and industrial processes could be responsible for 15-20% of emissions reductions (5-10 Gt CO₂ per year) in a range of scenarios.

One of the advantages of CCS is that it's relatively compatible with the current energy supply infrastructure and has well defined health, safety and environmental practices. As such, it is seen by many as one of few technologies available to mitigate CO₂ emissions at a large scale (IEA). A serious

disadvantage of carbon capture is that retrofitting existing plants with capture technology appears too costly. Therefore, it is proposed that only newly built power plants are subjected to mandatory immediate carbon capture retrofits.

The Australian Government decided to provide AU\$2.4 billion support investment in large scale integrated Carbon Capture and Storage pilot projects in Australia. Currently, there are four of these projects underway in Australia: The Otway Basin Pilot Project and Monash Energy Project in Victoria, the Gorgon Project in Western Australia, and the CS Energy Project in Queensland. This would imply that CCS is a viable and sustainable way of reducing CO₂ levels in the atmosphere.

However, carbon capture and storage is a very complex issue and it has many aspects which need to be considered when deciding on its feasibility such as for example the available technology, cost and safety perception among the public of long term carbon storage.

A problem which is only relevant to Australia has been pointed out by a preliminary study by the GEODISC group of the Australian Cooperative Research Centre for Greenhouse Gas Technologies. They found that the largest storage potential is in Western Australia but almost all of the biggest point sources emitters are in eastern Australia. As a result, Australia only has the potential to store 100-115 Mt per year of CO₂, corresponding to 27%-31% of total annual CO₂ emissions (Bradshaw et al., 2002). Therefore, according to the GEODISC group, carbon storage is at best a partial solution and Australia would do well to continue with and expand the development of efficient energy use and renewable sources of energy.

World wide, around 20 carbon capture and storage pilot projects have been proposed (Gibbins and Chalmers 2008) but large-scale feasibility has yet to be demonstrated. In 2008, G8 countries agreed to commit to large scale projects with deployment projected to be in 2015. With capture technologies well understood but remaining to be demonstrated at a large commercial scale, CCS is not expected before 2020.

Research Component (65%)

In no more than 1 page per part, you are asked to:

1. Describe what the reasons could be for Australia wanting to contribute to the development of CCS while developing countries such as India and China continue to build power stations but are not at the forefront of CCS.
2. Describe and evaluate what the main concerns are of Carbon Capture and Storage.
3. Describe how CCS will affect the cost of electricity for an average Australian house hold and what the main contributions to this change in cost are.
4. Tabulate the current contribution of each of the main renewable energy sources (e.g., wind, solar) to Australia's electricity supply. Briefly evaluate the importance of each energy source to Australia's overall electricity supply.

Individual Component (35%)

As an individual, you are asked to respond to the following (max 1 page per part):

1. Explain if you think CCS is a feasible option for Australia in reducing its carbon emissions and also explain why.
2. Compare the time that is needed for CCS to become large scale to

- firstly, the timing of the global CO₂ reduction targets which the G8 has set themselves
- and secondly, the time it takes to plan and build a new power station

Give your view on how this could affect the development of CCS

3. What alternatives would you present if CCS would turn out not to be viable? Name at least three and explain why you think these options are most likely to tackle the problem of reducing CO₂ emissions.

Material (to start with)

Texts from Resources (Blackboard)

- *NSW first carbon storage*
- *World energy and climate change*
- *Coal and GHG (Greenhouse Gas Storage) Emissions Australia*
- *Clean energy for Australia*
- *Clean energy for Australia summary*
- *Sorting out the facts from fiction*
- *ACA Garnaut*
- *ACA Garnaut extra*
- *Development of Electricity Generation and Technologies*

Useful webpages

- <http://iea.org/ccs/>
- <http://www.ga.gov.au/ghg/index.jsp>
- <http://www.worldcoal.org/carbon-capture-storage/>
- <http://www.co2crc.com.au/>

Due Date: Thursday 26/5 2011

Assignment 4: Journal and Precis (GEOS803 students only)

The purpose of this exercise is to allow you to develop an appreciation of the key **topical** issues associated with the development and performance of the minerals and energy industries and for you to document the evolution of these issues in the context of the wider public debate.

In order to accomplish this, you are required to collect material for, and maintain, a journal (scrapbook) of newspaper and magazine articles (including internet versions) which you consider relevant and important to the mining industry and bear on the issues raised in GEOS251/GEOS803 (see the unit timetable for lecture topics; if in doubt consult with the unit coordinator). The scope of this exercise and the criteria for selection of material are matters for your own personal judgment. However, it is suggested that you:

(a) compile articles on a full range of issues relevant to GEOS251/GEOS803. **Be sure to submit all articles that you collect.**

(b) narrow the focus of your precis (summary) to a **few key issues**.

Material for the journal should be collected from the major daily newspapers and current affairs periodicals. **Photocopied extracts from textbooks and material downloaded from web sites (other than internet editions of newspapers, magazines and current affairs periodicals) are not to be used.** You should commence collecting material for your scrapbook **immediately**, continue doing so throughout the unit, and conclude with your written precis.

N.B., all articles included in your journal must be clearly marked with their correct source and date. Organising articles in your scrapbook by topic (e.g., oil, gold, climate change, etc.) will help you when summarising key issues in your precis.

You are required to write a precis (summary) of the issues documented in your journal. This must include responses to **all three** of the following:

- a. A summary and integration of the key **issues** (not individual articles) you have identified.
- b. Your views on how these issues will develop.
- c. Any consequences that you foresee flowing from (a) and (b).

The precis must have a maximum length of **1,500 words**. **You must submit your Journal with Precis attached.**

Due Date: Thursday 02/6 2011

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Unit of Study Booklet – Part III

Appendices

Appendices

Appendix 1 – How to give a presentation

Appendix 2 – Texts and References

Appendix 3 – Writing hints: Writing Tips, How to overcome Writers Block, Presentation of Assignment

Appendix 4 - Plagiarism & Correct citation styles

Appendix 5 – Example Exam

Appendix 1:

HOW TO GIVE A PRESENTATION

WHY?

- Giving a good talk is an essential skill
- In creating your presentation, think like a reporter and answer the "who, what, why, how, and where" questions.

Remember

- The main reasons for a presentation are to inform, to persuade or for a call to the action. It's not to distract. Use additional objects such as a chart, a drawing, an animation to improve the understanding of the message.
- Begin with the end. Give your conclusion and take the rest of the time to explain it. Don't forget a reminder at the end of the presentation.

General tips

- Tell 'em what you're gonna tell 'em, then tell 'em, then tell 'em what you've told 'em.
- Accumulate all the necessary material for the presentation; much more than necessary. You have to be ready for just about anything and everything.
- Collect questions you are asked and the answers you give. Prepare extra slides to answer expected questions.

Organization

Three devices can put a presentation in the desired perspective.

- 1) Indicate the scope of the presentation by an informative title.
 - 2) "Zoom in" to the topic during the introductory segment of the presentation and "zoom out" near its end.
 - 3) Decide on the underlying question that the presentation seeks to address; then divide that question into a hierarchically organized array of subquestions, and develop the presentations as a series of answers to these questions.
- Sidetracks from this mainstream should be brief and should always return to the same point in the mainstream where they started.
 - Omit information not directly relevant to the focus of the presentation, and avoid backtracking
 - statements should delineate a clear, logical line of thought.
 - Formulate explanations of scientific concepts and experimental (or theoretical) methodology unambiguously
 - Do not use professional jargon.
 - The presentation should end with a clearly formulated, concise conclusion. When the take-home message has been delivered, stop.

Practical tips:

- Be honest. If you don't have the answer to a question, say it at once.
- Vary the tone of the voice on the important points of your presentation or according to the presented material. Don't put too much of it!
- To end the presentation gently, add a black slide at the end of the presentation. So, when the slide show ends, you'll not return to slide mode.
- The text of slides consists of keywords. It's up to you to explain them and to give them meaning.
- Do not overload a slide. The audience should be capable of finding quickly the main point of the slide. Be clear and precise.
- Add an object, or a text, ONLY if it helps the understanding of the main point.
- Be constant ! Use the same presentation format, the same type of characters in the same size throughout your presentation.
- Do not put more than 6 points per slide for bullet lists.
- The main title of the slide should be on a single line. limit yourselves to a maximum of 5 in 7 words for the title.
- Try to have the best possible contrast between your text and the back of your presentation.
- To have the best possible effect, use 2 or three colors for the slide.
- Do not use the red or green colors to put of the accent on a word or on an object. Between 10 % and 15 % of the population have difficulty differentiating these colors.
- Have a limited no. of slides (2-3 min. per slide)
- Assure that the font is big enough to be legible even from behind of the room used for the presentation.
- Use a simple, clear font: Helvetica, Times, Arial
- Don't write a text in capital letter.
- Before presenting, check the spelling.
- Don't learn by heart your presentation.
- Be interested in the subject, it's contagious! Especially if the subject is well explained in terms that the audience understands.
- Set time aside for practice
- Are your explanations understandable?
- Talk to the audience, not to the screen/floor/projector.
- Read out axis labelling of graphs
- Anything out of the ordinary gives a presentation that special memorable touch, setting it apart from others.
- don't read your slide. restate the points in your own words and elaborate on them
- Look convinced. Act convinced. Even if you're not.

Nervous?

- Nervousness is healthy-it shows that the presentation is important to you and that you care about doing well.
- Relax. Take a deep breath
- Concentrate on the message, not on how you are coming across.
- Use eye contact.
- Do not apologize
- Forget perfection
- Learn to laugh at yourself
- Build in appropriate humor
- Going From Good to Great (ask for feedback)

Appendix 2:

TEXTS AND REFERENCES

Unit of study booklet

This contains material that will be referred to in lectures. The booklet is essential for you to have to follow the lectures.

There is no one book that adequately covers the unit material for GEOS251/GEOS803 and it is not recommended that you purchase any of the following reference books. There are also no lecture notes or readings for GEOS251/GEOS803. The most current and important information resource available is the **internet**.

Major References:

There is no single text that adequately covers the unit material of GEOS251/GEOS803. However, you will find the following three texts to be very useful for technical aspects and some general background:

Barnett, DW, 'Minerals and Energy in Australia', Methuen, Sydney, 1979. (This text is no longer in print, but several copies are available in the Library, HD9506.A812.B3).

Craig, J.R., Vaughan, D.J., and Skinner, B.J., 'Resources of the Earth: Origin, Use and Environmental Impact', Prentice Hall, New Jersey, 2001 (Third Edition). (HC21 .C72 2001)

Kesler S, 'Mineral Resources, Economics and the Environment', Macmillan College Publishing, USA, 1994 (Reserve TN.145.K44).

If you want to get more into the processes of ore mineralization processes I recommend the following book: *Introduction to Ore-forming Processes* (Lauren Robb, Blackwell Publishing, 2010)

References:

I have included below a list of books and journals that will provide useful additional reading for this unit. This is by no means a complete reference listing, but should act as a guide to the relevant sections of the Library. Also provided below are links to a large number of useful internet resources which provide more up to date information. This list is by no means exhaustive and you will need to find additional sites to complete the three research projects.

Library Loans

The Library at Macquarie will have provided you with information on library loans. The procedures differ for metropolitan and country students. Please familiarise yourself with the procedures appropriate in your case. If you have any enquiries contact the Library on (02) 9850-7500.

The sections of the Library most useful for this unit and which will aid in your search for material for the assignments are:

HC79 +, HC610 +, HD9500 +, TN1 +, Q1 +

Books:

- Bartlett R H, 'The Mabo Decision', Butterworths, Sydney, 174 pp, 1993.
- Blunden J and Reddish A, 'Energy, Resources and Environment', Hodder and Stoughton, United Kingdom, 1991.
- Bradley R S and Jones P D (eds), 'Climate Change since AD 1500', Routledge, London, 679 pp, 1992. Carr D D and Herz N (eds), 'Concise Encyclopaedia of Mineral Resources', Pergamon Press, Oxford, 426 pp, 1989.
- Connell J and Howitt R, 'Mining and Indigenous peoples in Australasia', Sydney University Press, Sydney, 1991. Cousins D and Nieuwenhuysen J, 'Aboriginals and the Mining Industry', George Allen & Unwin (Publishers) Ltd., Sydney 185 pp., 1984.
- "Energy 2000" A National Energy Policy Paper, Dept of Primary Industries, 1988. (HD9502.A82.A853).
- Finlayson JD, 'The Right to Negotiate and the Miner's Right: a Case Study of Native Title Future Act Processes in Queensland', Centre for Aboriginal Economic Policy Research, Canberra, 20 pp, 1997 (DU120.A1.D57/Vol. 139).
- Graves J, 1996, 'Global environmental change: plants, animals and communities', Longman, England, 266 pp, 1996.
- Hancock P, 'Green and Gold - sustaining Mineral Wealth, Australians and their Environment', Centre for Resource and Environmental Studies, ANU, Canberra, 1993.
- Harrigan B and Young S, 'Commercial Implication of Native Title', Federation Press, NSW, 428 pp, 1997. (KW2562.C266).
- Huggett, RJ, 'Environmental Change: the Evolving Ecosphere', Routledge, London, 376 pp, 1997.
- Meadows DH et al., '*The Limits to Growth*', Universe Books, New York, 1972.
- Meadows DH, Meadows, DL, and Randers J, '*Beyond the Limits*', Earthscan Publications Limited, London, 1992. (HD75.6.M43)
- Mercer D, 'A Question of Balance, Natural Resource Conflicts in Australia' The Federation Press, Sydney, 1991. (HC610.E5.M47).
- Pearce DW and Turner RK, 'Economics of Natural Resources and the Environment', John Hopkins University Press, Baltimore, 1990. (HC79.E5.P37)
- Raymond R, 'Out of the Fiery Furnace', Macmillan Company, Melbourne, 274 pp., 1984.
- Tapp BA and Watkins JR, 'Energy and Mineral Resources: an Introduction', Cambridge University Press, 151 pp, 1988. (TN263.5.T36)
- Tatz C, 'Aborigines and Uranium and Other Essays', Heinemann Educational Australia, 190 pp, 1982.
- Tietenberg T, 'Environmental and Natural Resource Economics', Third Edition, Harper Collins Publishers, USA, 1992. (HC79.E5.T525)
- Wilson A J, 'The Living Rock', Woodhead Publishers, UK, 275 pp, 1996. World Commission on Environment and Development, '*Our Common Future (The Brundtland Report)*', Oxford University Press, 444 pp, 1990. (HD75.6.O97)

Journals:

- ABARE, Agriculture and Resources Quarterly (HD.2152.A415)*
- AusIMM Bulletin and Proceedings (TN.A38)*
- Australian Mining (TP1.C36)
- Energy Policy. (HD9540.6.E5)*
- Environmental Ethics (HC79.E5.E5772)
- Environmental Pollution (TD172.E5)
- Environmental Science and Technology (TD180.E48)*
- Materials and Society (TA.401.M37)
- Metals and Minerals Annual Review (TN1.M5175)
- Mineral Resources Review (TN122.S7.A3)
- Mining Journal (TN1.M65)
- Mining Review (TN.121.M5)*
- Nature (Q1.N2)
- New Scientist (Q1.N52)*
- Oil and Gas Journal (TN860.04)

Resources Policy (TN1.R38)*
Scientific American (T1.55)*
Science (Q1.S35)
The Energy Journal (HD9502.A1.E536)*

Internet Resources

Perhaps the largest source of, and certainly most current, information related to Minerals, Energy and the Environment is the World Wide Web. Numerous relevant sites are listed below and these link to literally thousands of others.

Please note the following:

- a) There is no filtering process (e.g., peer review) with electronic publishing. Internet articles may be opinionated and contain factual errors. However, government sources of information and statistics should be reliable.
- b) You are not permitted to insert large blocks of downloaded material directly into your assignments. Where information from an internet source is used, it **must** be correctly acknowledged (see section on correct referencing).

Mineral Economists

Brook Hunt:

<http://www.brookhunt.com/>

AME Mineral Economics *Online*:

<http://www.ame.com.au/>

Mining Associations, Institutes, Centres and Unions

American Geological Institute

<http://www.agiweb.org/>

Association of Mining and Exploration Companies (AMEC):

<http://www.amec.org.au/>

Australian Mining and Exploration Industry Association:

<http://www.reflections.com.au/MiningandExploration>

Australasian Institute of Mining and Metallurgy:

<http://www.ausimm.com.au/>

Construction Forestry Mining Energy Union:

<http://www.cfmeu.asn.au/>

London Metal Exchange

<http://www.lme.co.uk/>

Minerals Council of Australia:

<http://www.minerals.org.au>

Mineral Policy Centre:

<http://www.mineralpolicy.org/>

New South Wales Minerals Council

<http://www.nswmin.com.au/>

Specific Commodities

Aluminium

Aluminium Federation (ALFED):

<http://www.alfed.org.uk/>

Australian Aluminium Council:

<http://www.aluminium.org.au>

European Aluminium Association

<http://www.eaa.net/>

World Aluminium

<http://www.world-aluminium.org/>

Coal

Australian Coal Association:

<http://www.australiancoal.com.au/>

World Coal Institute:

http://www.wci_coal.com/

The Australian Black Coal Industry report at:

<http://www.pc.gov.au/projects/inquiry/coal/docs/finalreport>

Copper

The Copper Page

<http://www.copper.org/>

International Copper Study Group:

<http://www.icsg.org/>

Gold

World Gold Council:

<http://www.gold.org>

Lead and Zinc

International Lead and Zinc Study Group:

<http://www.ilzsg.org/>

Oil and Gas

Australian Gas Association:

<http://www.gas.asn.au/>

Australian Institute of Petroleum (AIP):

<http://www.aip.com.au/>

Australian Petroleum Production and Exploration Association Limited (APPEA):

<http://www.appea.com.au/>

Oil and Gas International:

<http://www.oilandgasinternational.com/>

Titanium

International Titanium Association:

<http://www.titanium.org/>

Uranium

Click [here](#)

Mining/Oil Companies

ARCO (Atlantic Richfield Company):

<http://www.arco.com/>

Barrick Gold Corporation:

<http://www.barrick.com/>

BP/Amoco:

<http://www.bpamoco.com/>

BHP Billiton:

<http://www.bhpbilliton.com/>

Energy Resources of Australia Ltd. (ERA):

<http://www.energyres.com.au/>

Exxon Corporation:

<http://www.exxon.com/>

Heathgate Resources Pty. Ltd.:

<http://www.heathgateresources.com.au/>

Inmet Mining:

<http://www.inmetmining.com/>

Kennecot Minerals:

<http://www.kennecottminerals.com/>

Mobil Corporation:

<http://www.mobil.com/>

Newcrest:

<http://www.newcrest.com.au/>

Ok Tedi Mining:

<http://www.oktedi.com/>

Phelps Dodge Mining Company:

<http://www.phelpsdodge.com/>

Rio Tinto:

<http://www.riotinto.com/>

Royal Dutch/Shell Group:

<http://www.shell.com/>

Tomago Aluminium:

<http://www.tomago.com.au/>

Energy

Australian Institute of Petroleum:

<http://www.aip.com.au>

California Energy Commission:

<http://www.energy.ca.gov/>

Electricity Supply Association of Australia Limited:

<http://www.esaa.com.au/>

Hydro Tasmania:

<http://www.hydro.com.au/home/>

International Atomic Energy Agency:

<http://www.iaea.org/>

International Energy Agency:

<http://www.iea.org/>

Links and Resources for Energy and the Environment:

<http://zebu.uoregon.edu/energy.html>

Macquarie Generation:

<http://www.macgen.com.au/>

National Electricity Market Management Company:

<http://www.nemmco.com.au/>

Pacific Power:

<http://www.pacificpower.net>

US Department of Energy:

<http://home.doe.gov/>

US DOE Energy Efficiency and Renewable Energy:

<http://www.eere.energy.gov/>

US Energy Information Administration:

<http://www.eia.doe.gov/>

World Energy Council:

<http://www.worldenergy.org/>

Alternative and Renewable Energy

Australian Greenhouse Office:

<http://www.greenhouse.gov.au/>

Australian Renewable Energy Website:

<http://www.greenhouse.gov.au/renewable/index.html>

Australian Wind Energy Association:

<http://www.auswea.com.au/>

Blayney Wind Farm:

<http://www.blayney.local-e.nsw.gov.au/about/1001/1010.html>

Crookwell Wind Farm:

<http://www.argylecounty.com.au/nature/windfarm.html>

Hot Rock Energy:

<http://hotrock.anu.edu.au/>

International Clearinghouse for Hydrogen Based Commerce:

<http://www.ch2bc.org/>

Renewable Energy Generators of Australia:

<http://www.rega.com.au/>

Renewable Energy Power Stations:

<http://www.agso.gov.au/renewable/>

US National Renewable Energy Laboratory:

<http://www.nrel.gov/>

Windustry:

<http://www.windustry.org/>

Environment and Sustainable Development

Australian Conservation Foundation:

<http://www.acfonline.org.au/>

Australian Minerals and Energy Environment Foundation (AMEEF):

<http://www.environmentdirectory.com.au/associations/ameef.html>

Cooperative Research Centre for Greenhouse Gas Technologies:

<http://www.co2crc.com.au/>

Friends of the Earth:

<http://www.foe.org.au/>

Global Warming:

<http://www.climatehotmap.org/>

GreenNet Australia:

<http://www.green.net.au/>

IEA Greenhouse Gas R&D Programme (IEAGHG):

<http://www.ieagreen.org.uk/>

Institute of Energy and Sustainable Development:

<http://www.iesd.dmu.ac.uk/>

IPCC (Intergovernmental Panel on Climate Change):

<http://www.ipcc.ch/>

The Sustainable Energy and Anti-Uranium Service (SEA_US Inc.):

<http://www.sea-us.org.au/>

Union of Concerned Scientists:

<http://www.ucsusa.org/>

United States Environmental Protection Agency:

<http://www.epa.gov/>

World Business Council for Sustainable Development:

<http://www.wbcsd.ch/>

World Resources Institute:

<http://www.wri.org/>

Timbarra/Lake Cowal

Lake Cowal Campaign:

<http://www.rainforestinfo.org.au/gold/lakep.html>

Barrick Gold:

<http://www.barrick.com/>

Coalition to Protect Lake Cowal:

<http://www.savelakecowal.org>

Timbarra Gold Mine:

http://en.wikipedia.org/wiki/Timbarra_Gold_Mine

Tibarra Information:

<http://www.green.net.au/adan/timb/info.htm>

Timbarra Media Statements:

http://www.pythagorus.org.uk/rusty/chapter_one/response.htm

Timbarra Protection Coalition:

<http://www.bigscrub.org.au/timbarra.html>

Timbarra Information Network:

<http://www.nrg.com.au/~bsmith/>

Uranium and the High Level Nuclear Waste Repository Concept

The Anti-Nuclear Alliance of WA (ANAWA):

<http://www.anawa.org.au/>

The Association for Regional and International Underground Storage (ARIUS):

<http://www.arius-world.org/>

The Australian Nuclear Foundation, Inc.:

<http://oznucforum.customer.netspace.net.au/>

International Atomic Energy Agency:

<http://www.iaea.org/>

NAGRA:

<http://www.nagra.ch/index.tpl?lang=3&cart=11411620531821500>

Uranium Information Centre (UIC):

<http://www.uic.com.au/>

UIC report on International Nuclear Waste Disposal Concepts:

<http://www.uic.com.au/nip49.htm>

World Nuclear Association:

<http://www.world-nuclear.org/>

Global Organisations

Europa (The European Union):

<http://europa.eu.int/>

International Monetary Fund:

<http://www.imf.org/>

Organisation for Economic Development (OECD):

<http://www.oecd.org/>

UNESCO:

<http://www.unesco.org/>

United Nations:

<http://www.un.org/>

United Nations Environment Programme:

<http://www.grida.no/>

United Nations Division for Sustainable Development:

http://www.un.org/esa/sustdev/about_us/aboutus.htm

United Nations Framework Convention on Climate Change:

<http://unfccc.int/>

World Bank:

<http://www.worldbank.org/>

Geological Surveys

Geoscience Australia:

<http://www.agso.gov.au/>

British Geological Survey:

<http://www.bgs.ac.uk/>

United States Geological Survey (USGS):

<http://minerals.er.usgs.gov/>

Australian Government Departments

Australian Bureau of Agricultural and Resource Economics (ABARE):

<http://www.abare.gov.au/>

Australian Bureau of Statistics:

<http://www.abs.gov.au/>
Australian Greenhouse Office:
<http://www.greenhouse.gov.au/>
Australian Renewable Energy Website:
<http://www.greenhouse.gov.au/renewable/index.html>
Australian Trade Commission:
<http://www.austrade.gov.au/>
Bureau of Rural Sciences:
<http://www.affa.gov.au/brs>
Chamber of Minerals and Energy of Western Australia:
<http://www.cmewa.com/>
Commonwealth Scientific and Industrial Research Organisation (CSIRO):
<http://www.csiro.au/>
Department of Agriculture, Fisheries and Forestry:
<http://www.affa.gov.au/>
Department of Energy, Utilities and Sustainability:
<http://www.deus.nsw.gov.au>
Department of Environment and Water Resources:
<http://www.environment.gov.au/>
Department of Industry, Tourism and Resources:
<http://www.industry.gov.au/>
Environment Portal:
<http://www.environment.gov.au/>
Productivity Commission:
<http://www.pc.gov.au/>
NSW Department of Energy, Utilities and Sustainability:
<http://www.deus.nsw.gov.au/>
NSW Department of Infrastructure, Planning and Natural Resources:
<http://www.dipnr.nsw.gov.au/>
NSW Department of Mineral Resources (NSW DMR):
<http://www.minerals.nsw.gov.au/>
Productivity Commission:
<http://www.pc.gov.au>

Indigenous People

Native Title Tribunal:
<http://www.nntt.gov.au/>
Northern Land Council:
<http://www.nlc.org.au/>

Media

Australian Financial Review:
<http://www.afr.com.au>
Economist:
<http://www.economist.com>
London Financial Times:
<http://www.ft.com>
Sydney Morning Herald:
<http://www.smh.com.au>
Wall Street Journal:
<http://wsj.com>

Appendix 3: WRITING HINTS: WRITING TIPS, TIPS TO OVERCOME WRITERS BLOCK, PRESENTATION OF ASSIGNMENTS

WRITING HINTS

This section includes

- 1) link to The Macquarie Gateway to Academic Literacy - [EDUCGATEWAY](#)
- 2) Writing Tips – by Steve Draper of the Psychology Department at the University of Glasgow, in Scotland
- 3) Tips to overcome writers Block
- 4) Presentation of Assignments

2) Writing Tips

by Steve Draper of the Psychology Department at the University of Glasgow, in Scotland
Installed at <http://www.psy.gla.ac.uk/~steve/resources/crs.html>

Essay writing

Here are some points that apply to any essay, including critical reviews (and indeed to PhD dissertations, web documents written for students, ...). The rest of this major section contains what I feel is most important to tell the kinds of students I deal with (including PhD students).

However, even though you may well just be reading this document to get a quick idea about what "critical reviews" are, this section is about writing in general. Though you probably haven't realised this yet, writing well is likely to be something you will be striving to do for the rest of your life, even in careers where that isn't obvious. As a postgrad, I thought of doing research as about having good ideas: but in fact being successful depends on the quality of my writing both in papers and in grant applications. My sister works for a charity, organising support of various kinds for children and families in deep trouble. Now she finds this career is not just about understanding children: writing funding applications (to pay for the staff under her) is a crucial skill, on which ultimately any support the children get depends. Giving impromptu talks to billionaires at charity fund raisers is also important, and also depends upon expressing herself clearly. Or, delving again into my family history, my grandfather wrote a moving document when his first wife died in childbirth, as a testament for his child (who survived) to read in later years. Clearly such personally important actions would be undermined if, when you most need it, your powers of writing are limited. So consider how to develop your skills. One (only one) way is to make time at some point to read through books on writing such as Gowers' *The complete plain words*.

(As an alternative to reading this section, you could look at other advice, such as [Alice Jenkins' advice on writing English essays](#) (4 pages and pointers to other similar advice). She points to this more elaborate [essay guide for literature students](#).

A paper on [writing scientific papers](#) (9 pages), recommended by Lars Muckli, probably highly relevant to writing your maxi projects, and of some relevance to CRs.

Gopen, G.D. & Swan, J.A. (1990) "The Science of Scientific Writing" *American Scientist* (Nov-Dec 1990), Volume 78, pp.550-558.

Highly recommended by an ex-student of mine is this [guidance on writing for anthropology students](#) (33 pages). Also of possible interest: [How to write a philosophy essay](#) (18 pages.)
[How to write a philosophy essay](#) (1 page.)

Planning and expressing the structure

There are really four stages here: collecting material for the essay, deciding what your main message and argument really are, deciding what structure to adopt in order to communicate that, and indicating your structure to the reader. The first is the result of the issues and activities discussed above (e.g. selecting, reading, and thinking), the middle two are about "planning" your writing and perhaps writing an essay plan, the last about making sure your plan is clear to the reader.

Deciding what your argument is

Thus you will probably at this point have a collection of points and facts you think of some value: the raw material for the essay; not a plan, but the elements to fit into the plan. Some students will now realise they have too much material to fit within the size limit. They must decide what is important to include, and what to leave out. The way to do that selection is to do what everyone must do anyway: decide what the overall point or conclusion is, what are the points or evidence that most directly and strongly support those conclusions, and so on. When you know what the main point or points are, then you can decide what is most important for supporting those conclusions.

If this is proving difficult for you, one technique I find useful in my own writing is to put away my notes, and try to speak a 60 second version. For example grab a friend, preferably one who doesn't know about your topic and isn't all that interested, and tell them what your essay is going to say. You automatically make it brief to keep their attention, and mention only the most important things without the details. When you hear yourself give the summary, that tells you what for you is the most important point; and hence how to organise your essay. E.g. "My CR is about autism, and the main feature of this field is all the different theories that don't really fit together, yet all of them seem to have some support." If you hear yourself say that, then you probably want an essay with one section for each of the major different theories, and a concluding discussion pointing out how they conflict. Or you might have found yourself saying "My CR is on autism, and although there are various theories, I'm just concentrating on the claim that it comes from a specific neurophysiological deficit. There's a few papers on this, and I'm going to focus on how strong the evidence they present really is. There are really two classes of problem here: firstly the evidence for the deficit is scanty and might be questioned at least until more studies are done, and secondly it is hard to see how all the symptoms and consequences can really be the effect of a single deficit when they vary so much from case to case." Here the essay might take each of a few selected papers in turn, and apply the basic criticisms repeatedly to each.

Deciding on how to group and order your points

Now you have decided what your main message is, and so know how to decide what is important to include, you must decide on the order and structure of the points you make. Writing is inherently a single unbranching sequence, but the logic of any argument is about grouping (e.g. where several points all support one conclusion) and subgrouping; and often any one point could belong (logically) to several groups. Thus in deciding the detailed structure of your essay you are making many decisions, some of them for strong reasons, some for weak reasons. E.g. a conclusion comparing theories has to go after the main sections because it needs to refer back to all of them; but if you have one section for each of three main theories there may be no strong reason for which order those three go in, although obviously all the points about one theory belong together in that one section. Again, you could decide to have a main section for each of several papers you critique, repeating some standard critical issues in each section; or else you might have one section per critical issue, repeatedly discussing each paper with respect to one issue at a time. Both are logical, but you can only adopt one of these schemes.

Your essay plan (whether written or mental) describes both the grouping and the sequence of your points. Your final essay can't avoid displaying the sequence, but by itself this could just be an enjoyable experience as each sentence slips past and the reader bounces from point to point. However the more you get the structure clear in your head the better organised the essay will be, and the more you convey that structure to the reader, the more likely it is that they will understand how the parts hang together, be able to remember your argument afterwards, and give you credit for clarity of thought.

Indicating your structure: sections, section titles, and "glue"

It is a good idea to divide your essay into sections, each with a clear title (e.g. Introduction, Conclusion, ...). Unless you are unusual and read all papers from start to finish without exception, you will already know that these are helpful to you when you read others' writing; they allow jumping to and fro to find

what you want, they tell you what to expect in each section, and so on. They are also quite helpful in writing, as they represent the plan you should be making of the structure of the paper. So do it.

You may sometimes consider not only using sections, but several different levels of headings, which you might or might not actually number, e.g. section 2 Main review; section 2.1 The paper by Burton; section 2.1.2 lack of a valid control group.

The argument against using sections is if you are writing a smoothly flowing story where each little point (a paragraph) leads to the next with no need to tell the reader where they are going, or to resummarise at the end, or to make any links other than to the paragraph before and after the current one. In all other cases, sections help, by allowing a way to represent a hierarchy or grouping, rather than just a sequence with everything at the same level, and unrelated except to its two neighbours. But even if you do have a smooth story, it isn't hard to divide it into sections, even if these seem not very important.

The more general principle is to make sure the reader knows **what** every aspect of your plan is and furthermore the reason for it i.e. **why**, explaining wherever necessary either in the introduction (saying what comes later) or in "glue" sentences at the start of a section or both. Section titles, if clear, may well in effect express what the essay plan is (e.g. if each mentions a different paper, it will be clear you are critiquing each of a set of papers in turn), but you might want to say why you chose this structure (e.g. in the introduction, say "this review discusses each paper in turn since the critical issues are somewhat different for each of these papers"). Tell the reader how and why you selected the papers (e.g. "6 papers were selected on the basis of being recent, published in good journals, and being easily available. The abstracts of a much larger set of related papers were looked at, but do not suggest that different issues are raised by them"). Additionally, explain to the reader what your critical strategy was e.g. "this review is mainly based on an explicit controversy in the literature" or "this review takes a methodological framework common to medical studies in general, as discussed in Pocock (1993), and applies it to the selected papers which, as will be seen, do not measure up well to these standard criteria", or "the few papers in this area are critiqued partly on general grounds and partly by taking each point any of the authors themselves raise in discussion and applying them systematically to all the papers".

Gopen & Swan: Organising each sentence and paragraph so as to be clear

This section deals with the intermediate level of writing between details such as spelling (see sections below), and how to organise the overall structure of the whole CR (see sections above). The test is: can others understand your writing easily? If so, then you may not need advice here, and if not, then revising the paragraphs they complain about will probably get you through.

In my experience, our psychology students don't often have great problems here, so if you are just reading this document to get started on critical reviews, then you probably don't need to read this section. However if you are interested in advice on writing as a whole, particularly advanced advice, then you may want to check this out.

This section is basically about a paper by Gopen & Swan (1990) ([reference](#) at the end of this document including a direct link to a copy), that was recommended to me by Lars Muckli. What is fascinating about it is that they give several examples of writing for scientific journals that don't have problems with spelling or grammar but left me feeling it must just be too technical for me to understand. They then demonstrate that in fact it was bad writing, but I wasn't perceptive enough to see that; and they offer an analysis. However I'm not convinced that their paper offers a practical approach I can use effectively to solve these problems: but they do have both a real problem and a theoretical analysis that I don't have.

Although its examples are all drawn from highly technical bits of science papers, the principles are general, and address both the structure of sentences and the connection between them i.e., roughly speaking, how to organise paragraphs. The paper is particularly good at analysing why some sentences make you confused or uneasy although you can't put your finger on why; and at explaining what is wrong with the simplistic rules you sometimes see about how short sentences are good, long are bad; active verbs good, passive ones bad. Most often, too, as they show, once you have rewritten the sentences to be easier to understand, then it becomes clear that important bits of information were entirely missing and need to be added. If you want a master class on this level of writing: this is the paper (9 pages long) to study.

Their general theory

1. Readers (not only authors) affect the meaning and impact and effect of text by interpretation: in particular, by their expectations, which are set partly by context.
2. Expectation has a significant impact at several scales:
 - The structure of the paper e.g. into sections
 - The scientific content: what was the experimental structure? how many subjects? etc.
 - The topic/predicate (or topic-stress position) structure of sentences (basically, old information, and the new information that is the point of the sentence).
 - The subject-verb basic structure of a sentence

Authors need to be constantly aware of all these expectations their readers have, and either to satisfy them or else to manage them by clearly signalling how they should be modified.

The paper also demonstrates that the principles apply as much to the structure and layout of (data) tables as to the prose in the main text.

Practical procedures

Given their demonstration that this issue can lead to serious problems in a text, that need to be corrected, how can this be done? Gopen & Swan in effect only discuss one approach, but there are (it seems to me) three quite different ones.

- A. Trial and error. I.e. as a writer, have no explicit theory like theirs about what good writing is, but generate alternative phrasings repeatedly until it looks right and you, and your friends, judge it is now clear when read. This approach has no theory or conscious method for generating drafts, and no explicit theory of how to correct them, just a focus on readers' reactions.
- B. The detailed pre-planning approach. Plan and re-plan the detailed structure of the essay focussing all the time on its "[logical skeleton](#)": i.e. on the logic of the argument; organise everything around this argument; and use lots of "glue" text to connect the parts and tell the reader what relationship they have to each other. This is what I tend to do, and is essentially using essay planning extensively and down to quite a fine level: of every substantive point that is mentioned, even though there can be more than one of these in a single sentence. This will deal with all their problems, but by planning and not by correction. However the literature on writing makes it clear that, whatever teachers say, creating a plan first is only a natural way to write for about half the people: so perhaps it is this large set of people who might find the Gopen & Swan approach important in practice. This approach focuses on a method of producing good versions, not correcting them.
- C. The editorial approach: the Gopen & Swan way. Analyse and correct drafts, using their explicit theories, and their seven rules or rather principles (given in the next subsection) to critique the current draft. This approach is about how to correct versions. I can't help feeling that this method is much more appropriate for an editor trying to improve someone else's text than it is for an author trying to improve their own writing method.

In the end, good writing probably uses all three methods to some extent. A writer who doesn't expect to read over and revise their work -- and have others do this too -- is very unlikely to produce optimum results (A). A writer who doesn't plan when writing may never sort out a clear structure. I say this, because in the more involved Gopen & Swan examples, their rewriting leads to a stage where it becomes clear there is missing material -- i.e. that re-planning the content is now essential (B).

Where do good plans come from? I, at least, find that blurting out a version is the only way I have of discovering what I have to say, and what my real message is -- whether that "blurting" is a first draft full of the problems Gopen & Swan identify, a rough "plan" that lets me see those problems before I even attempt complete sentences, or a quick summary to a friend when I'm still struggling with finding a good plan. This is really the "bottom up" approach to writing where you (I) write first, and work out the plan and message afterwards. Gopen & Swan (C) seem to be analysing what happens when you have done this, but not gone on to revision.

Their seven principles

Here I reproduce their seven principles, but to understand them you may have to read the paper. The over-arching principle is about managing readers' expectations through some key aspects of sentence structure. "None of these reader-expectation principles should be considered 'rules'."

1. Follow a grammatical subject as soon as possible with its verb.
2. Place in the stress position the "new information" you want the reader to emphasize.
3. Place the person or thing whose "story" a sentence is telling at the beginning of the sentence, in the topic position.
4. Place appropriate "old information" (material already stated in the discourse) in the topic position for linkage backward and contextualization forward.
5. Articulate the action of every clause or sentence in its verb.
6. In general, provide context for your reader before asking that reader to consider anything new.
7. In general, try to ensure that the relative emphases of the substance coincide with the relative expectations for emphasis raised by the structure.

Title

The title should ideally be 6 words or less. It should tell people what is in the essay. The ideal title should (in order of importance):

- Describe accurately what is in the essay
- Be 6 words or less long
- Be witty and memorable.

This is almost always impossible, but it is what to aim for. Note that a title is used, and should be designed, in order to pick out the item from a particular context. In a book on educational evaluation, my chapter's title does not need to say "education" or "evaluation", but in a general education journal it should indeed say "evaluation". Your CR will/should have "critical review" on the cover page anyway, so it probably does not need "critical" or "review" in the title; whereas if it were published in a journal, it probably would need "review" to distinguish it from the surrounding papers that are reporting new research.

Abstract

Abstracts are virtually always useful on documents (though they may be called "executive summaries" or something else on company reports, university strategy documents, etc.).

The first thing you need to know (or decide) is how many words. The hard part of writing an abstract is to get it to fit the word limit, and this varies wildly in different cases: from 150 words to 2,000 word "extended abstracts" is the range I myself have had demanded of me. If I were imposing a limit, I might specify 250 words for a level 3 CR, and 450 words for the level 4 CR.

An abstract **MUST** summarise the whole paper, and it must be short. Because of this, it cannot also introduce the topic carefully in all other ways. Its implicit aim is to tell the reader whether they want to read the paper, so you want to pack it with things that will attract suitable readers, but if it leaves many questions of detail unanswered, that is fine: they will be answered in the main paper. The most common error is for the abstract just to be a general introduction for the reader to read first. On the contrary, abstracts may be read without the paper, and the paper may be read without the abstract; they should be written for this as independent standalone items.

So a reasonable approach in constructing an abstract is a statement of the topic or area, a summary of the main points (you could even begin with stringing together the section titles), and a summary of your conclusion. Bear in mind that part of how readers select papers is by type or method: so for an experimental study mentioning the number of subjects may be a good idea in areas where many papers have too few subjects to be worth reading, but not in other areas, where saying that your subjects were selected in the workplace and were not students may be what picks your study out. For a CR, if your title doesn't have the words "critical review" in it, then putting them in the first sentence of

the abstract is probably a good idea e.g. "A critical review centering on four papers on the topic of Ritalin abuse by overworked child minders ..."; or "44 papers are briefly surveyed and grouped into three themes to provide an overview of the heavily researched area of ...".

A good tactic I sometimes follow for writing abstracts is to start a paper by scribbling down an abstract before starting on the paper (as a kind of plan for myself); and then returning at the end to change it to reflect the paper as it turned out. But writing it at the end is also fine. You probably can't write it properly before you have finished the paper.

The most common fault I see in abstracts is having them introduce the topic, but not get on to saying what the paper says and concludes.

A tricky issue is overlap of the abstract with the rest of the paper, especially the introduction. Many readers will have just read the abstract when they start reading the introduction, so if you repeat the wording they will be a bit bored and irritated with you; but some will not have read the abstract so you must repeat all the information elsewhere. I frequently make up an abstract, at least to start with, by pasting together sentences from elsewhere, but try to ensure at least that no two consecutive sentences are the same in the abstract and another section.

Introductions

In my opinion, introductions have more than one function. The general one is to introduce the story "Once upon a time ...". For an academic piece, as opposed to a novel, this can be expanded as:

- State what the topic is (and is not). Readers of all kinds need to be told as soon as possible what this is really about: partly so those who don't want to know can drop it quickly (remember, you must have scanned hundreds of papers it turned out were not what you wanted); and partly so they don't expect the wrong thing. The job is to guide readers' expectations, so they don't have to fill the vacuum by assumptions and then criticise you for not satisfying the wrong expectations they were allowed to form.
- Set the scene e.g. where the topic comes from, one or two classical references from which it sprang.
- But, unlike a novel, it is very helpful to academic readers to tell them where the paper is going: give an outline in a sentence or two. Abstracts are supposed to do this, but it should also be in the introduction, whether or not there is an abstract. This really helps the reader to know what to expect, and helps them to suppress questions that occur to them half way through ("why hasn't she mentioned X ...?") which in fact are going to be answered just as soon as they can be fitted in. Surprise is a virtue in a novel; but on the whole is a bad idea in an academic paper.

In a word: introductions should manage readers' expectations by anticipating what they are expecting, and warning them about anything that is different from that.

So introductions should both **introduce the topic** by setting the scene conceptually and historically, and **introduce the paper** by saying what it covers and where it is going to end up.

In summary, an introduction should cover:

1. Define/delimit what the topic is and is not.
2. Say where the topic comes from.
3. Define/delimit this essay's scope (e.g. "reports two experiments" or "reviews four papers, and touches on six others" or "deals only with recent drug therapies, not the wider alternatives").
4. Say where the essay is going to.

If these seem such different things that they don't fit smoothly together, do not hesitate to have several subsections within the introduction.

First person constructions

Many people have been trained to avoid first person constructions in scientific or scholarly writing i.e. using "I", "we" (and "us", "me" etc.). Thus even though much of their writing is reporting actions they have taken, judgements they have made, and ideas they have had, they do not say this directly.

However this convention is now under active debate in the best scientific (not just psychology) journals, and will probably change. Of course, it will be 40 years before all those trained up until now have died out, and some of those will never change their habits. Thus continuing to follow this practice can save you trouble in the short run, but may increasingly come to look archaic.

However, a mistress of language should be able to express what is necessary regardless of restrictions on syntactic forms. In my (!) view, the underlying issue of substance is to convey whose is each view: what status, what origin, what authority, what grounds for plausibility it has. This is particularly important in a critical review where what is being conveyed comes from a mixture of sources: unquestioned consensus, particular authors being reviewed, and ideas and points originating with the reviewer. And on the petty scale, it is a real question in the mind of staff marking CRs: is this an original criticism, a reproduction of one from the literature, or a new (original) use of an old point e.g. a critique read in one context applied to a new context? These all deserve credit, but different kinds of credit: for original analysis, for intelligent selection of the literature, for appropriate transfer of an idea from one part of the literature to another.

The trouble with the convention of no-first-person in the hands of many mediocre practitioners is that it allows people to pretend that, or anyway to write as if, an unfounded opinion is universally known and accepted; and for unquestioned consensus (the law of gravitation) to be written about in the same way as the author's report on their own lab observations ("the subjects took a mean time of 3.5 secs for the task"), and also as their personal suggestions or analytic points. These are quite different grounds for considering a proposition, and critical thought requires that both writer and reader know and consider these differences. In the context of a standard paper reporting an experiment, these different statuses are usually clear anyway, so it doesn't matter much (e.g. the introduction deals with what the paper is going to take for granted, the results section is about what this author claims to have observed, the discussion and also the use of "may" is about the author's opinion or interpretation as in "this effect may be due to xxx").

However in a critical review this is often much less clear. Nevertheless even within the no-first-person convention, it is possible to signal clearly about the origin and/or status of each proposition, and in my view you should do so, whether or not you adhere to the old convention. For example "Dawkins (1999) offered the criticism that xxxx. This might also be applied to other work, yyy." (i.e. this is the reviewer's new application of Dawkins' original critical point). "An additional criticism, not apparent in the literature so far, is that zzzz" (i.e. the reviewer's own personal point). Similarly "Another problem would seem to be zzzz" (which equally makes it pretty clear it is the reviewer's own point, not supported by other authority).

In summary, you can't write a CR without opposing the critic's -- i.e. your own -- views to those of published authors. You should clearly label whose views are whose. My own preference is to use direct first person language, but if you wish (or are instructed) to avoid the first person, you should find clear indirect ways to convey this essential information.

Citations and indirect citations

The basic idea of citations is to list all papers mentioned in a section at the end called "References" (or possibly "Bibliography"), each with enough detail so that anyone would be able to obtain the paper themselves, and to refer to ("cite") the papers more briefly within the text e.g. "Smith (1990)". That is, the reference in the text should allow the reader to pick out without any uncertainty or difficulty the fuller reference in the Bibliography section, and that fuller reference should allow the reader to retrieve the paper from a library. (What is rather seldom done, but perhaps should be more often, is to give a way of finding, once the reader has got hold of the cited item, the place in that book or paper that actually holds the statement, figure, or argument being referred to.)

Many variations exist with different disciplines using quite different conventions. Psychology students should stick to those used in the psychology literature, but many variations are possible even within this

style. For instance just occasionally you might give the title in the text if this was directly relevant to the sentence it was in; you might use the author's name as part of the text e.g. "Smith (1990) argues that ..."; or you might tack on references at the end of a paragraph rather than within sentences, to show your backing for the paragraph's argument as a whole. E.g. "(Smith, 1990; Jones, 1988.)". You will see examples in nearly every paper you read, and in the course handbook. Full details on the many variations can be found for instance in the APA style manual: *Publication Manual of the American Psychological Association*, Fourth Edition. (The library has the second edition: [Level 5 Main Lib; Psychology B235 AME].)

However in these CRs, you should attend to a new issue. Before your third year, the style of teaching and of the essays you have written has been to refer to work and theories that you have been told about, but for which you haven't usually read the original papers yourself, simply as a way of referring to the idea and authority for it (e.g. "Newton's laws" or "Piaget, 1970"). However in a review, you are not presenting yourself as a student mentioning knowledge your reader already possesses. Instead, you are offering your personal description and evaluation of a few specific papers. If you mention a paper here, the presumption is that you personally have read it.

The common reasons for mentioning a paper are

- To show off your reading: but if you haven't read it yourself, that would be misleading. (What you are supposed to get marks for is wide reading, not longer lists of papers you should have read.)
- As an authority to support an assertion you make. But if you haven't read it, then you don't know for sure what it really says (let alone if its claims are true). A review is in part about checking such things.
- To avoid appearing to imply that an assertion is your own idea.

A scrupulous accuracy in all your statements is the way to deal with all this.

A weak approach to this is to allow yourself to refer to papers you have not yourself read, but to be explicit about it: we might call this indirect citation. You could do this as follows: "Smith(1990) quotes Jones (1989) as saying 'Blah' and that all swans are black"; or "According to Jones (1989), as cited in Smith (1990), sheep may be carnivorous...". Then list both the Smith and the Jones references if you have them; if you don't have a precise citation for the Jones paper, then just leave it out of your reference list and delete the "(1989)" in the examples. Although this is always inferior to checking the references yourself (which is always desirable as so many mistakes and distortions occur in references made in published papers), this makes it clear to the reader what you have and haven't claimed you have verified, and gives them maximum information for checking themselves if they wish. It can be inevitable if references to unobtainable technical reports are made, and conversely you may do it to make a criticism as in "Smith(1990) quotes Jones (1989) as saying that sheep are carnivorous, but reference to the original text shows that Jones' claim was only that sheep had been observed to eat ham sandwiches when wrapped in grass".

However the tough standard here is to avoid citing any paper that you haven't read yourself. Why would you want to mention one? After all, if you haven't read it, you don't know for sure what it really says (let alone if its claims are true). You have read Black (say), so just stick to what Black says. Why does Black mention White? just to support a claim they, Black, wanted to make. So you could simply say "Black asserts that cows are carnivorous", or "recent papers on the topic all assume X, citing work from 1970 as their authority, but without offering any other verification". On the other hand, if Smith is citing Jones in order to dispute their alleged claim, then in a review you surely would want to have checked Jones' paper because it is a crucial part of Smith's argument, which you are reviewing, as opposed to being merely a passing support for a point Smith believes in.

An advantage of this tough standard, is that your reference list will contain only the papers you have actually read, preventing readers from being misled by your bibliography (even if they would not be misled by your main text). A disadvantage is that readers cannot use your bibliography directly to go deeper than you, but would have to go to the papers you read to get the references to earlier literature.

In fact there are quite a lot of wrong citations in the published literature, almost certainly from authors failing actually to read what they cite. Simkin & Roychowdhury have estimated from this that "only about 20% of citers read the original" [Simkin, M.V. & Roychowdhury, V.P. (2002, Dec 3). "Read before you cite!" WWW document]. URL <http://arXiv.org/abs/cond-mat/0212043> (visited 2002 Dec 15)]. However you should not do this a) because it is bad practice and attracts criticism whenever noticed, and b) because reviews above all are to provide reliable accounts of the literature (at least in other papers the main point is to present new data or theory).

Spelling and punctuation

This is a very common cause of moaning from employers about graduates, and many student essays make me feel the same. It also annoys examiners and gives them an excuse for not trying harder to understand what you mean. (It is also true that the quality of manuscript I, as a reviewer, see submitted by academics to many academic journals is in this respect much the same as students in this department: very variable, with plenty of bad practitioners. And, I am sorry to say, I still have quite basic things to learn myself. Recently a co-author had to point out to me that after 48 years I still hadn't learned the difference between when to use "practice" and when "practise" -- like "advice" and "advise" she taught me.)

Help on spelling, punctuation and apostrophes is also available from someone else [here](#). My own advice is as follows.

If you want to improve, then

- Critique each others' writing at this level. It is MUCH easier to spot others' errors than one's own.
- Use a dictionary. Don't rely (only) on computer spelling checkers which are only good at spotting the things you can spot easily by eye. The hard to spot ones are missed by the checkers (the/then, of/or, affect/effect, practice/practise, missing 's' in plurals etc.).
- Use Fowler's "Modern English Usage", or rather Burchfield's new (third) edition of it, for things other than simple spelling, such as apostrophes. *The new Fowler's modern English usage* edited by R.W. Burchfield. 3rd edition (Oxford: Clarendon Press) (1996) [Level 9 Main Lib, and ULL; English Ref D460 BUR]
- *The complete plain words* by Ernest Gowers (1948), now revised by Bruce Fraser, is also very good on these and other matters. [Level 9 Main Lib; English D421 GOW5]

Common spelling problems

If you use the spelling checker in your word processor and don't bother to read your writing at all, you will get some complete nonsenses (e.g. "the" for "then", "of" for "or").

If you do read your writing but still rely on the checker for words you actually aren't sure about, then you will get caught especially by words that sound and look similar but actually have different spellings for different meanings or grammatical roles. Common errors currently include: its/it's (see below), practice/practise, dependent/dependant, affect/effect, principle/principal, illicit/elicit.

Apostrophes

The single worst-done issue is that of apostrophes. The main points are in these examples, which are correct usages selected to imply and illustrate the rules:

- Fowler's book, the man's face, the car's wheel.
- His book, her face, its wheel. No apostrophe in this "its" any more than in "his".
- He's a sight so he is, she's a picture so she is, it's bust so it is.
- Apostrophe to mark a missing letter, as also in: he'd better, I'll go, shan't I.

Punctuation

There are a lot of wrongly placed commas around. Putting one where you might pause in speaking is a clue, but no more reliable as a rule than, say, speaking whenever someone smiles at you. It's a correlation all right, but you know how much to trust correlations, don't you?

Plain English

Plain English means being clear, brief, and not long winded yet harder to understand. Students usually only have minor versions of this disease. <http://www.plainenglish.co.uk/guides.htm> [downloadable short guide](#)

For light relief, here's a collection of creative words that were just invented on the spot. I do NOT advise you to use them in academic work, yet you could probably argue that they are plain, even though not accepted, English. [wordlust](#)

Footnotes

The short advice is: don't use them.

If you are a psychology student, you probably won't be tempted to use footnotes, because of course the main rule of writing is to fit in with the community you are writing in and for, and the convention in academic psychology is generally not to use footnotes. However this document is in part general advice on writing, and some disciplines, e.g. History, do use footnotes. In that case, so should you.

However some of us get tempted to use them poorly. The principle to worry about is whether a reader can read comfortably and fluently, or is continually having their reading broken up by having to jump to the bottom of the page, read a bit there, then jump back. A good use of footnotes, where they are the convention, might be to have flowing text in the main text, and footnotes are (only) used to give the citations to the literature or evidence of the main argument. Then readers who aren't thinking about detailed evidence can ignore the footnotes altogether, but those doing checking can follow the links. A bad use of footnotes however uses them for extra detail. A reader cannot safely avoid them, and all that is achieved is breaking up smooth reading: only someone who had already read the whole text and was re-reading only for a summary could afford to skip the footnotes. This is really a form of [the issue discussed earlier](#), that language and hence text is linear, but arguments are non-linear branching tree structures or networks. Part of the skill of writing is to find a single path through and offer it to the reader. Using sections and subsections can express this non-linear structure, and yet still gives the reader a single order in which to read everything. Footnotes fail to do this. Using footnotes for extra explanation, though logical, is simply failing to address the heart of the authoring task. Either the extra explanation is necessary (if so, put it in the main text), or isn't (so leave it out).

(I remember reading a preface in which Oliver Sacks said his editor had finally called him to account on this, pointing out that he now had over a third of his book in footnotes. Deservedly best-selling author though he is for his books on the mind-body borderland, his editor was right.)

Get someone to proof-read your writing

I find it hard to follow this rule, but still I never manage to write anything without at least one or two silly errors in. (In a document this long, even though I will have read it through two or three times, there is probably at least one. In fact in re-reading this in 2000, I found three typos that had survived all previous checking.) Getting someone else to read it through after you've done your own best checking is much the best tactic. We all have different blind spots, and the chances are that your errors will be obvious to them (and vice versa). It is also good for catching sentence constructions which, even if legal, are in practice too difficult for others to understand. Good writing should not just be correct, but easy to read: and that can only be judged by someone other than the writer.

Cover pages, page numbers etc.

(See also the requirements in the course handbook.)

The cover page. Before printing off a piece of work, just consider the reader for a moment. Check you have your name on it, and that it is labelled for the type of work (critical review in this case) so someone can classify it even if it got dumped in a pile of incoming "mail" of different kinds. Most likely staff will search for the name, not the title: so having your name in the biggest clearest print is actually helpful to them, not boastful. For you, you may search through a pile of your own work (so your name won't be useful) and you will be looking for something that means "critical review number 2" (you will be doing three critical reviews): so that information is useful to you, and perhaps to staff if the paper gets mis-filed somewhere. No harm in having other information on the cover page, especially if it could be useful (matric number, date e.g. "level 3, term 2, 1999", whatever), but make the most useful information the

biggest/clearest; and consider the different kinds of user: **secretaries** (which student's CR is this?), **tutors** (is this a research paper I should read? or something I should mark? and if so which of my groups does it come from?), and **yourselves** (which of my bits of work was this? e.g. level three, second CR).

Page numbers. It is useful to have page numbers. If your CR is ever going to be unbound, ever going to go through a photocopier, get dropped on the floor, or shuffled in a pile, page numbers are the best safeguard. In fact, as you hand it in, how do even you know you have all the pages and in the right order?

Since you all print single-sided, the binding (e.g. staple) will almost certainly be on the left hand side. That means if the reader is flicking through looking for a page number, they will be looking at the right hand side (the left side will be the last bit to be exposed as the page is opened). Personally, I find it easiest to look at the top (right hand) corner. That is where page numbers are most useful. So page numbers in the centre of the bottom may look nice when the page is open by itself, but are less useful when page numbers are being used in earnest.

Finishing it: Keeping and making copies

The formal requirement is to hand in a single printed copy (see the handbook). However both you and your supervisor may like to have a separate copy for reference in either or both electronic and paper versions. Electronic takes less space, and re-using chunks is easy; paper can be easier to put through a photocopier. Certainly I sometimes like to give students CRs from the past: they are often useful literature reviews that can help start a new maxi or CR. Furthermore, you may like to offer it to employers as a sample of your work: certainly there is nothing like a quick look at a CR or maxi report to tell me if this person can write competently or not, and indeed it is also a demonstration of your word processing skill. And offering it makes it look like you are proud of your work, even if the employer doesn't really look at it.

So plan how you are going to preserve your work for at least a year or two beyond the life of your university computing account; and ask your supervisor if they want a spare copy. This advice probably applies even more to your maxi project than to your CR.

Extra points about writing in a CR

These have each been mentioned above, but I'll stress them again. They are particular points about structure and style that apply to CRs rather than other essays or dissertations.

- Justify your selection of the papers you chose to review: otherwise it looks random. Say (briefly) why you chose them: the most interesting, representative of the different views, the most recent? And listing the papers you have chosen briefly (probably in your introduction) helps the reader be clear about the scope and structure of your CR.
- The introduction should manage the readers' expectations; in particular tell the reader how you have structured the rest of the CR: by paper, by theme, by critical point,
- Provide explicit definitions of technical terms and categories wherever this is central (as opposed to merely relevant) either to the criticisms you will discuss, or to how the topic is defined and the papers selected. It's surprising how simply writing out an exact definition immediately leads you to making some critical comments.
- Be extra-scrupulous about citations: do not cite papers you haven't personally read (use indirect citations if appropriate, as discussed above). Even if you think it's OK to cite papers you haven't read in other writing, in a review the whole essay is about your personal discussion of what others have written.
- Tell the reader which criticisms are your own thoughts, and which you are repeating from others (e.g. an author's self-criticism). Both are interesting, but tell the reader which is which. (See above for the issues of using or avoiding first person language, which comes up in this connection.)

Revising a paper or CR

"Writing isn't writing, it's rewriting." [P.Caputo *A rumor of war* p.349 (1977/96) (Pimlico: London)]

If you want to improve quality, revise what you write. When you no longer want to change it when you yourself read it through, get someone else to read it and comment on it. This is easily the single biggest thing you can do to improve quality, but you have to allow some time for it. It won't work to delay work until near the deadline, write it in a hurry, then wonder about readers: you have to plan ahead.

Even if you have a very patient friend, you only get the best out of any reader the first time, when it is new to them. So if you are serious about quality, line up more than one reader, and revise it after each set of comments before using your next reader. If you think one reader is better (more expert) than another for this piece of work, save the best reader till last (get the less good one to find the worst of the spelling mistakes etc. first).

As mentioned earlier, it is probably a good idea to think of fellow students as your audience: this will encourage you to be interesting, and not to assume too much, which will then lead to you writing more clearly and impressing everyone especially staff.

Putting all this together, and doing basic time management reasoning on it, you might have a work plan something like this:

- Deadline - 4 weeks: Finish reading articles and making notes both about content and about critical points you might make. Now you can plan a structure.
- Deadline - 4 weeks: Tell a friend orally (i.e. aloud, not in writing) what your CR is about and its main points. This will make it clear to you what the most interesting thing(s) you have to say is. Organise the CR around that.
- Deadline - 3 weeks: finish a complete draft, and revise it obsessively. Get someone to read it through for typos.
- Deadline - 2 weeks to 8 days: give your best draft to your last and best reader.
- Deadline - 1 week: get back comments from your last and best reader
- Deadline - 2 days: hand it in. You need to plan for 2 days to allow for broken printers, storms that prevent you travelling into Uni to hand it in, etc.

If, when revising, you are told by your readers, or can see for yourself, that your writing just isn't clear, but you can't see what's wrong with it and how to improve it, then you may want to look at the section above on the [Gopen & Swan approach](#) to organising each sentence and paragraph so as to be clear.

Further / advanced work: where CRs fit into wider perspectives

Most of you will just regard this web document as an aid to getting through a compulsory exercise. But if you wonder where, or whether, CRs fit into anything wider, then here are two leads.

The rhetorical form of scientific literature

The published literature you examine in CRs is written to persuade other scientific readers, and a considerable part of doing a CR is learning to examine how well a given paper addresses this purpose. Rhetoric is the traditional discipline of persuasion. For a somewhat startling view of the role of the literature -- what part it is playing in technoscience -- see chapter 1 of: Latour, B. (1987) *Science in Action* (Open University Press) [Level 5 Main Lib, and ULL; Gen Sci M8 1987-L]. Latour began as an anthropologist, and they of course pride themselves at seeing through the little myths we like to tell about ourselves. I admire him enormously, but don't expect his views to go down well with most academics.

Critical thinking

As mentioned above, an old, but from your viewpoint valuable, text on critical thinking is:

Abercrombie, M.L.J. (1960) *The anatomy of judgement: An investigation into the processes of perception and reasoning* (Free association books: London). [Level 5 Main Lib; Psychology F570 ABR]

There is also a current topic in educational and psychological circles called "critical thinking", which views it as a teachable generic mental skill, and would view CRs as an exercise to develop it. If you would like to explore this perspective, a good reference is Kuhn, D. (1991) *The skills of argument* (Cambridge University Press: Cambridge) [Level 5 Main Lib; Psychology F570 KUH].

Actually I feel rather contemptuous of some of this literature, as it fails to understand the extent to which it is a partial re-invention, without realising this or grasping the wider generalisations available, of the

rather better preceding literature initiated by Perry. (A brief description of Perry's views and some references are included in [this web document](#) associated with my APEC lectures). This literature seems to assume, without looking for evidence, that critical thinking is a general mental skill unrelated to context or discipline; that it "should" be acquired by everyone without teaching (like your first language); and that (they look for evidence of this point) shockingly not all students have automatically got it. My own view is that it is a useful transferable skill, but that like nearly everything it comes from practice (not osmosis, infection or spontaneous generation), and that its role in universities depends strongly on the particular discipline.

Argumentation

Others, however, call much the same thing "argumentation", and are interested in whether there is a general thing that could be called argumentation, how to teach it to students, and whether computer tools could be useful for this. [Jean McKendree](#) offers these links to computer argumentation tools/papers:

- [Archelogos and Log analysis](#)
- [Belvedere](#) (not available?)
- [BGuile](#) see also [here](#)
- [Convince Me](#)

Further reading?

There are of course other documents on the web offering advice on this subject. A couple I have come across are:

- BRINK-BUDGEN, R van den. 2000. Critical thinking for students: learn the skills of critical assessment and effective argument. 3rd edn. Oxford: How to Books. [listed here](#)
- [critical thinking by Thomson Learning](#).

Appendix

Here is a sketch of one particular search trail, to illustrate how a combination of clues often can work out.

A student said she was perhaps interested in finding a topic in education, and I said I'd recently seen a TV programme on the issue of whether formal teaching vs. play-based activities were more effective in schooling for 4-7 year olds. I couldn't remember the relevant names, nor had I ever read anything on this.

- I went to the BBC web site. <http://www.bbc.co.uk/home/today/>
- Couldn't find it at first; remembered it had been a Panorama programme, so after a bit I realised Panorama might be under "News" not "Education". <http://news.bbc.co.uk/>
- Found a pointer to the programme:
<http://news.bbc.co.uk/hi/english/education/newsid%5F186000/186707.stm> and
<http://news.bbc.co.uk/hi/english/education/newsid%5F185000/185466.stm> That gave me the name Kathy Sylva as the one discussing the research.
- WWW search on Kathy Sylva gave a page mentioning her
<http://www.ioe.ac.uk/cdl/cugrants.html>
- Poking around on the same site (web page for that unit) <http://www.ioe.ac.uk/cdl/> found a personal page with her publications <http://www.ioe.ac.uk/cdl/kathy.html> (Although emailing her may be necessary to find the literature about that issue.)

Postscript: projects

Although all the skills of critical reviews play a part in writing up any piece of work really well, projects also involve additional skills. In particular, they involve: TEARS: time, expertise, access, resources, and support (as Kay Persichitte puts it).

Writing up a research project in psychology builds on writing lab reports, but it also requires constructing a reasoned argument like a CR. The weakest reports just say what was done and have no real conclusion -- no real argument.

Collected references

Here I have collected, in case it is convenient for you, copies of all the references I mention above.

[Alice Jenkins' advice on writing English essays](#) (4 pages and pointers to other similar advice).

[Definitions of critical thinking](#)

[Essay guide for literature students.](#)

[Foundation for critical thinking](#)

[Guidance on writing for anthropology students](#) (33 pages).

[How to write a philosophy essay](#) (18 pages).

[How to write a philosophy essay](#) (1 page and 10 more pointers).

Abercrombie, M.L.J. (1960) *The anatomy of judgement: An investigation into the processes of perception and reasoning* (Free association books: London). [Level 5 Main Lib; Psychology F570 ABR]

APA *Publication Manual of the American Psychological Association*, Fourth Edition. (The library has the second edition: [Level 5 Main Lib; Psychology B235 AME].)

Brink-Budgen, R van den (2000) *Critical thinking for students: learn the skills of critical assessment and effective argument* 3rd edn. (Oxford: How to Books)

P.Caputo *A rumor of war* p.349 (1977/96) (Pimlico: London)

Fowler & Fowler *The new Fowler's modern English usage* edited by R.W. Burchfield. 3rd edition (Oxford: Clarendon Press) (1996) [Level 9 Main Lib, and ULL; English Ref D460 BUR]

The complete plain words by Ernest Gowers (1948), now revised by Bruce Fraser [Level 9 Main Lib; English D421 GOW5]

Gopen, G.D. & Swan, J.A. (1990) "[The Science of Scientific Writing](#)" *American Scientist* (Nov-Dec 1990), Volume 78, pp.550-558.

Kuhn, D. (1991) *The skills of argument* (Cambridge University Press: Cambridge)

Latour, B. (1987) *Science in Action* (Open University Press) [Level 5 Main Lib, and ULL; Gen Sci M8 1987-L].

Laurillard's *Rethinking university teaching*

Wenger, E. (1987) *Artificial intelligence and tutoring systems*

3) Tips to Overcome Writers Block

How many of you have trouble getting started on a writing project? I certainly do. The project doesn't have to be something as hard as an academic essay, either; it could be something as seemingly simple as writing a letter to your grandparent. The act of creating something out of nothing seems more the province of God, not mortals, but it's an act we engage in every time we sit down to write with a blank page staring back at us.

Facing all of that whiteness can be intimidating. If you're using a computer to write, the blinking cursor doesn't help any; if anything, it seems impatient for input, like it doesn't have the time to wait for you to think up something good. That kind of pressure just makes it all the more difficult to get started.

If you (like me) fear the blank page, don't worry - you're not alone. Most of my students find it hard to start writing an essay from scratch, too. I'd venture to say your reaction is abnormal if you don't approach a blank page with at least a little bit of trepidation. Here are some common problems/issues when writing:

The practice of writing:

- It's hard to get started, especially if you're out of practice
- Even if you have experience in other areas, academic writing is different
- You feel capable of producing an acceptable end product, with adequate prose, but the process of getting there is painful
- Feeling inadequate when your writing doesn't come up to your (or others') expectations
- Putting off writing, for fear of writing badly

Handling the information that you gather:

- Feelings of drowning in the literature, in the detail
- Structuring ideas that you are developing
- How you record and process the information
 - hand-written notes, or typed into the computer

Communicating your ideas:

- If your writing is too terse: possibly you're not explaining what you mean sufficiently for a reader to understand?
- If your writing is too verbose: possibly you're not being clear about what you want to say?
- Problems in structuring the argument

Time management:

- When is the right time to write?
- How much time should you spend on research versus writing?
- How should you structure your work?

Here are some tips on how to get started:

1. Make sure you understand the assignment. If you don't understand what is asked in the assignment it could be that you don't have enough background information. So start with doing a little research for getting a general idea of what the topic is about.
2. Make sure the literature that you review is relevant to the assignment.
3. Once you have a general understanding of the topic (don't get too hung up on details), do some brainstorming whereby you write down anything that comes to mind and might be relevant to the topic. Include any questions you have and look for something that interests you personally.
4. Outline the different ideas, add any additional information you can think of without doing research and assess what you will use and in what order. Organizing your ideas is very important. It will help you develop a flow in your paper.
5. Now you have a basic layout for your paper. It might change slightly later or you feel you want to add things but generally this will be the basis for doing your extensive research. Focus your research and make sure you have enough material on every individual topic.

-
6. Once you feel you have enough material, start writing with whatever you feel most comfortable. Don't worry too much about your writing style and grammar to start. It is always much easier to re-write or delete parts that you have written at an earlier stage than it is to start from scratch. Sometimes you will feel more comfortable writing about something that might not be relevant to the introduction of your paper but will cover some of the results or method. Even starting with the conclusions of a paper will help you get started. REMEMBER – a draft is a draft for a reason, you are allowed to make mistakes and it doesn't have to be perfect!

4) Presentation of Assignments

You are required to research, prepare and write the assignments at the standard expected at tertiary level. Since most of what you learn is tested in written form, it is essential that you learn to write effectively. Organisation is the key to achieving this, and the following steps should assist you.

Preparation

- (i) Determine what is required in the case study report. Make sure you understand each word used to ensure that you are writing to the topic set, not to one of your own invention.
- (ii) Read the relevant unit material and generate a list of key words, which will help you locate other references in the Library. Do this early. Remember that reference books may be hard to find if you leave your library research too late.
- (iii) When taking notes from a reference always note the bibliographical information and Call Number. If you write down a quotation, take a note of the page it was on. There is nothing more frustrating than having to look back through a book for one sentence.

The Outline

- (i) Introduction. Define terms and outline your approach to the topic.
- (ii) Discussion. This section is for explanation and discussion of the topic. It may help to write down a list of major points that will become your paragraphs, so that you can arrange your notes under each point.
- (iii) Conclusion. This is not a reiteration of the discussion, but a summary statement that rounds off the report.

The Drafts (at least one — more probably two or three)

- (i) Keep referring back to the question — have you strayed from the topic?
- (ii) Single sentences or paragraphs should not express too many ideas. A logical development of your theme should be the aim throughout the essay.
- (iii) In your initial draft, do not worry too much about the word limit. It is a simple matter to cut down extraneous or repetitive material in subsequent rewrites — in fact this should be your aim.
- (iv) Support your statements with facts and references.
- (v) References: quotations should be used only if the point being made is vital to your argument and if you could not express it better yourself. If you paraphrase, you must acknowledge your authority as you would when quoting directly — after the paraphrased section or quotation, i.e. (Smith, 1981, p.132). Make sure you document this reference in your Bibliography or list of References. Remember, plagiarism is cheating! All references must be clearly documented at the end of your assignment. For more details on referencing of material see Appendix **XX** of your Unit of Study Booklet.

The Final Product

- (i) If possible, allow a few days between writing your final draft and the finished report, to allow you to critically read and edit it. There is a danger that if it is too fresh in your mind, you will read what you think is there, rather than what you have actually written. Read your final draft through several times — once for fluency and clarity of ideas, once for punctuation and once for spelling. For clarification of problems, refer to an authority such as the Australian Government Publishing Service Style Manual.
- (ii) Write (or type — learn now if you are an untidy writer) your assignment for submission, and then check it again. Is there a title, your name on each page, page numbers, etc.?
- (iii) Submit your assesmet on or before the due date to the GEOS251 / GEOS803 assignment box in the ELS Centre (level 1, E7A), and keep a digital copy or photocopy. Assignment boxes are located in the reception area of the ELS Centre (Room 101), which is on the ground floor at the western end of building E7A. Campus maps are available at <http://www.bgo.mq.edu.au/campus.htm>. The Centre opens from 8.30am to 5.30pm on Monday to Friday. An after hours submission box is located at the entrance to E7A, (a labelled slot in the door nearest to E5A). All assignments are to be submitted **before 5PM** on the date specified and must include a completed and signed coversheet stapled to the front cover. The Assignment Cover Sheets are partly filled out for you at the end of the unit outline or alternatively, these can be downloaded from the web at www.els.mq.edu.au, click on Assignment Cover Sheet.

Formatting

- (i) All typed text submitted for assignments is to be 12 point font at 1.5 line spacing. Margins should be approximately 2 cm. Place your name in the header and number each page.
- (ii) Page limits should be strictly adhered to.
- (iii) In all that you hand in, marks will be given for “communication”; that is how effectively you communicate your ideas. This will include how well your text/maps/profiles/sketches convey your concepts, and how well written your report is (including correct use of English and of referencing procedures – see Appendix 2).

Now, perhaps, you can see how important it is to start the whole process early if you are to do a good job. If you are having problems along the way, consult your tutor, and consult a how-to-do-it text.

Appendix 4: PLAGIARISM & CORRECT CITATION STYLE

PLAGIARISM

The Dangers of Plagiarism and how to avoid it

The University's policy can be found at: www.mq.edu.au/policy/docs/academic_honesty/policy.pdf
The integrity of learning and scholarship depends on a code of conduct governing good practice and acceptable academic behaviour. One of the most important elements of good practice involves acknowledging carefully the people whose ideas we have used, borrowed, or developed. All students and scholars are bound by these rules because all scholarly work depends in one way or another on the work of others.

Therefore, there is nothing wrong in using the work of others as a basis for your own work, nor is it evidence of inadequacy on your part, provided you do not attempt to pass off someone else's work as your own.

To maintain good academic practice, so that you may be given credit for your own efforts, and so that your own contribution can be properly appreciated and evaluated, you should acknowledge your sources and you should ALWAYS:

- 1 State clearly in the appropriate form where you found the material on which you have based your work.
- 2 Acknowledge the people whose concepts, experiments, or results you have extracted, developed, or summarised, even if you put these ideas into your own words.
- 3 Avoid excessive copying of passages by another author, even where the source is acknowledged. Find another form of words to show that you have thought about the material and understood it, but remember to state clearly where you found the ideas.

If you take and use the work of another person without clearly stating or acknowledging your source, you are falsely claiming that material as your own work and committing an act of PLAGIARISM. This is a very serious violation of good practice and an offence for which you will be penalised.

YOU WILL BE GUILTY OF PLAGIARISM if you do any of the following in an assignment, or in any piece of work which is to be assessed, without clearly acknowledging your source(s) for each quotation or piece of borrowed material:

- 1 Copy out part(s) of any document or audio-visual material, including computer-based material.
- 2 Use or extract someone else's concepts or experimental results or conclusions, even if you put them in your own words.
- 3 Copy out or take ideas from the work of another student, even if you put the borrowed material in your own words.
- 4 Submit substantially the same final version of any material as a fellow student. On occasions, you may be encouraged to prepare your work with someone else, but the final form of the assignment you hand in must be your own independent endeavour.

Some useful links:

[All My Own Work \(http://amow.boardofstudies.nsw.edu.au/\)](http://amow.boardofstudies.nsw.edu.au/) - a comprehensive, easy to access guide to acknowledging sources, plagiarism and copyright.

[You Quote It, You Note It! \(http://library.acadiau.ca/tutorials/plagiarism/\)](http://library.acadiau.ca/tutorials/plagiarism/) - from Acadia University, Canada. A light-hearted look at how to cite.

How does Plagiarism happen ? [University of NSW - \(http://www.lc.unsw.edu.au/plagiarism/how.html\)](http://www.lc.unsw.edu.au/plagiarism/how.html) an easy "Problem and Solution" approach to avoiding plagiarism.

Correct Citation Styles

(adapted from <http://www.lmu.ac.uk/lss/lis/docs/harv.htm>)

BIBLIOGRAPHICAL REFERENCES: HARVARD STYLE

Language Explained:

CITING means formally recognising, within your text, the resources from which you have obtained information.

BIBLIOGRAPHY is the list of sources you have used.

REFERENCE is the detailed description of the item from which you have obtained your information.

Why is this necessary?

It is to acknowledge the work of other writers; to demonstrate the body of knowledge on which you have based your work; to enable other researchers to trace your sources and lead them on to further information.

For these reasons it is very important that you think of the information needed to cite material correctly when you are carrying out a literature search. Always ensure that you record references to materials you consult precisely. Failing to do so could cause you additional work when you need to incorporate a reference into your bibliography.

Without such discipline the ability for researchers to trace relevant information becomes impossible. You would suffer along with all other researchers if limited or partial information was used in research work. A standard system of citing these references ensures an easier system of tracing academic and other knowledge more efficiently. There are a number of systems for referencing but we request that you use the Harvard System.

Why Harvard?

This system developed in the USA and grew in popularity during the 1950's and 1960's, especially in the physical and natural sciences and more recently the social sciences. Over several decades it has become the most common system internationally and is frequently the standard house style for academic journals.

The Harvard system has advantages of flexibility, simplicity, clarity and ease of use both for author and reader. There is no third place to look such as footnotes and chapter references, which are features of other systems.

Citing in the text

The Harvard system of citation is the most straightforward, because initially all you need to do is mention the author and date of publication in the text of your work. So, at each point in the text that refers to a particular document, insert the author's surname and publication year.

e.g. The work of Preece (1994) was concerned to emphasise the importance of quality in social research.

The reader can easily locate the full description of the item you have cited by referring to the alphabetical list of references (or bibliography) provided at the end of your report. The system has the advantages of showing at a glance the authority used who may well be recognised, and how recent or contemporary the information might be.

Note the following points:

** In the main text, initial letters are only used, in parenthesis, when two or more authors have the same surname and have published in the same year, in which case they should be identified by initials in order to avoid confusion.*

** Use lower case letters after the date if referring to more than one item published in the same year by the same author.*

e.g. The CBI, which has been very influential in raising the public profile of guidance, has itself adopted three very different positions on this matter: having initially argued that the careers service should be transferred from LEAs to Training and Enterprise Councils (CBI, 1989a) it subsequently appeared to support the notion that it should be led by LEA-TEC partnerships, and then announced that the TECs should not be directly involved in guidance delivery at all (CBI, 1993). There has however been increasing support for the notion of an individual-centred system. It is significant that the CBI speaking on behalf of its employers generally argued the classic liberal case for individual choice in the education training market in its report *Towards a Skills Revolution* (1989b).

** If the author's name occurs naturally in the text, the year follows in parenthesis.*

e.g. Customer compatibility management emphasises the controllability of customer to customer interaction in the higher education environment (Rowley, 1996). If the customer to customer interaction is good then you will get a return visit. It is the objective of effective customer compatibility management to enhance the service experience. Thus Rowley (1996) asserts that the ethos of the student environment does have an impact on student achievement.

Direct Quotation

** If you are giving direct quotations you should identify the page numbers. If details of parts of the document are required e.g. page numbers, track or title numbers of sound recordings, these appear after the date within parenthesis. The abbreviations are: page (p.) pages (pp.), section (s.) or sections (ss.).*

e.g. There is a need to create "stopping off" places in the learning process or what Kornbluh and Green (1989) refer to as "professional encapsulations". These encapsulations allow individuals time to assess and practice what they have learned, understand it more clearly and decide upon its relevance. "These resting times provide periods for reflection and permit time for new things to be learned, mastered and brought to fruition" (Jones, 1995 pp.122-3).

** When more than one reference is given at the same point in the text, they should be listed chronologically,*

e.g. Smith (1958), Brown (1964) and Jones (1992)

Multiple Authors:

Three or Fewer Authors

e.g. Cutler, T. Williams, K. & Williams, J. (1986).

Four or More Authors:

In the case of 4 or more, the first author (from the title page) followed by 'et al', or 'and others'

e.g. Matlock, J. et al. (1996).

IN THE BIBLIOGRAPHY

The bibliography that appears at the end of your work is organised alphabetically and is evidence of the literature and other sources you have used in your research. The first two elements of your reference, i.e. author and date, constitute the link you made in the text. Thus the reader can move between the text and the bibliography and trace a correct reference.

BOOKS AND PRINTED SOURCES

Book Titles

You should use the title page rather than the book cover as your authority.

ed. is a suitable abbreviation for editor.

Include the following information. The order is:

- (1) Author(s), editor(s) or the institution responsible for writing the book.
- (2) Date of publication (in brackets).
- (3) Title and subtitle (if any) Underlined or Highlighted or in Italics but be consistent throughout the bibliography.
- (4) Series and individual volume number (if any).
- (5) Edition if not the first.
- (6) Place of publication if known.
- (7) Publisher.

e.g. Spence, B. ed. (1993) Secondary school management in the 1990's: challenge and change . Aspects of Education Series, 48. London, Independent Publishers.

e.g. Mohr, L.B. (1996) Impact analysis for program evaluation . 2nd ed. London, Sage.

Journal articles

Include the following information in this order:-

- (1) Author of the article.
- (2) Year of the publication in brackets.
- (3) Title of the article.
- (4) Title of the journal, Underlined or Highlighted or in Italics but be consistent throughout the bibliography.
- (5) Volume and part number, month or season of the year.
- (6) Page numbers of article.

Where the author(s) is known:-

e.g. Bennett, H. Gunter, H. & Reid, S. (1996) Through a glass darkly: images of appraisal. Journal of Teacher Development, 5 (3) October, pp. 39-46.

or Clarke, T.J. (1995) Freud's Cezanne. Representations , No 52, Fall, pp. 94-122.

Where the article is anonymous:-

e.g. How dangerous is obesity? (1977) British Medical Journal , No 6069, 28th April, p.1115.

Newspaper Articles

e.g. Baty, P. (1998) Learners are born, says report. Times Higher Education Supplement , 16th January, p.5.

Exhibition Catalogues

Where there is no author use the Gallery or Museum.

e.g. Museum of Modern Art. (1968) The Machine. New York, MOMA.

It is the custom to capitalise the names of art movements.

e.g. Haskell, B. (1984) Blam! The explosion of Pop, Minimalism and Performance 1958-64. New York, Whitney Museum of American Art.

Conferences

You should include the following information. The order is:-

- (1) Name of the Conference.
- (2) Number (if appropriate).
- (3) Date.
- (4) Location (if appropriate).
- (5) Date of publication.
- (6) Title of published work; if different from the name of the conference, Underlined or Highlighted or in Italics, but be consistent throughout the bibliography.
- (7) Author/Editor.

- (8) Place.
- (9) Publisher.

e.g. Conference on Economic Crime, 2nd. 1977. London School of Economics and Political Science, (1980) Economic Crime in Europe , London, MacMillan.

'In' References

A Common mistake is to confuse the name of the contributor to a book of collected writings with that of the editor. Also used when citing a particular conference paper from the conference proceedings. The order is:-

- (1) Author of Chapter/Section.
- (2) Date of publication.
- (3) Title of Chapter/Section.
- (4) "IN" followed by Author/Editor of collected work
- (5) Title of collected work, Underlined or Highlighted or in Italics, but be consistent throughout the bibliography.
- (6) Place of publication.
- (7) Publisher.
- (8) Pagination of section referred to.
- (9) Book of collected writing.

e.g. Porter, M.A. (1993) The modification of method in researching postgraduate education. IN: Burgess, R.G. ed. The research process in educational settings: ten case studies . London, Falmer Press.

Conference Paper from Conference Proceedings

e.g. Fedchak, E. & Duvall, L. (1996) An engineering approach to electronic publishing . IN: Proceedings of the International Workshop on Multimedia Software Development, 25-26 March, Berlin. Los Alimos, Ca, IEEE Comput. Soc. Press. pp. 80-8.

CD-ROMs

The citing of information from computer databases varies. If you have, for example been using a CD-ROM to obtain journal references you only need to cite the journal as your source of information not the CD-ROM.

e.g. Royal Institute of British Architects. (1998) Architecture and Design Illustrated . London, RIBA [Multi-media CD-ROM]

If the information you are using is only available as a computer database you should cite them as follows:-

e.g. Gray, J. M. & Courtenay, G. (1988) Youth cohort study [computer file]. Colchester:ESRC Data Archive [distributor]

Citing URLs (Uniform Resource Locator/Internet Address) In a Bibliography.

There are a number of approaches to citing work from the Internet. We have chosen a style that fits with the Harvard style in order to maintain consistency. The following points should be noted:

- * Be consistent throughout. Fit with the Harvard style.
- * Cite enough information for the reader to locate the citation in the future. Occasionally, the URL for an electronic journal article may be excessively long as it will contain control codes. It is sufficient in such cases to just include enough of the URL to identify the site from where the journal came.
- * Many Web documents do give an author. If not explicit you may find the information in the header of the HTML encoded text. You can view this by choosing the option to view document source (a choice available from the view option in Netscape). Otherwise use the title as the main reference point as you would with any anonymous work.
- * If a document on the web is a series of linked pages - what is the title of the document? Do you cite the main contents page - or a particular page you are quoting from? This is a grey area.

* You should cite the date the document was last updated if this is apparent or the date when you accessed it, if not.

* In Internet addresses punctuation is important and the stops and commas in a bibliographic citation may confuse the reader, hence the common convention of using < and > to delineate the start and end of an URL.

We suggest the following:-

Electronic Journal Articles

Include the following information. The order should be:-

- (1) Author(s)/ Editor(s).
- (2) Year.
- (3) Title of Article.
- (4) Title of Journal, Underlined or Highlighted or in Italics but be consistent throughout the bibliography.
- (5) [type of medium].
- (6) Date of publication.
- (7) Volume number (issue number), pagination or online equivalent.
- (8) <Availability statement>. Note general point about journal article URLs above.
- (9) [Date of accession if necessary].

e.g. Smith, J. (1996) Time to go home. Journal of Hyperactivity [Internet] 12th October, 6 (4), pp. 122-3 Available from: <<http://www.lmu.ac.uk>> [Accessed June 6th, 1997]

e.g. Korb, K.B. (1995) Persons and things: book review of Bringsford on Robot-Consciousness. Psycholoquy [Internet] 6 (15). Available from: <<http://wachau.ai.univie.ac/Psycholoquy/95.v6/0162>> [Accessed June 17th, 1996]

OnLine Images

Include the following information, in the following order:-

- (1) Title of Image, or a description. Underlined or Highlighted or in Italics but be consistent throughout the bibliography.
- (2) Year.
- (3) [OnLine image].
- (4) Available from <URL>.
- (5) Filename including extension.
- (6) [Date accessed].

e.g. Hubble space telescope release in the Space Shuttle's payload bay. (1997) [online image]. Available from <<http://explorer.arc.nasa.gov/pub/>> SPACE/GIF/s31-04-015.gif, [Accessed 6 July 1997]

World-wide web documents

Include the following information and the order should be:-

- (1) Author/Editor.
- (2) Year.
- (3) Title. Underlined or Highlighted or in Italics but be consistent throughout the bibliography.
- (4) [Internet].
- (5) Edition.
- (6) Place of publication:
- (7) Publisher (if ascertainable).
- (8) Available from: <URL> [Accessed date].

e.g. Holland, M. (1996) Harvard System [Internet] Poole, Bournemouth University. Available from: <http://www.bournemouth.ac.uk/service-depts/lis/LIS_Pub/harvardsys.html> [Accessed 22 August, 1997]

Email discussion lists

Include the following information and the order should be:-

- (1) Author/Editor.
- (2) Year.
- (3) Title of message.
- (4) Discussion list name and date of message -underlined.
- (5) [medium] - Internet discussion list.
- (6) Available from: <e-mail list address> [accessed date].

e.g. Brack, E.V. (1996) Computing and short courses. Lis-link2 may 1996 [Internet Discussion list]. Available from: <mailbase@mailbase.ac.uk>[Accessed 15 Apr 1997]

It should be noted that internet based material may only be available for a short time and hence may not be suitable for referencing. It is advisable to keep a personal copy as evidence that the information existed.

Sample Bibliography

Bennett, H. Gunter, H. & Reid, S. (1996) Through a glass darkly: images of appraisal. Journal of Teacher Development , 5 (3) October, pp.39-46.

Conference on Economic Crime, 2nd. 1977. London School of Economics & Political Science. (1980) Economic crime in Europe ed. by L.H. Leigh. London, Macmillan.

Fragile Earth, 5. (1982) South American wetland: Pantanal Henley on Thames, Watchword Video, [video:VHS].

Holland, M. (1996) Harvard system [Internet] Poole, Bournemouth University. Available from: <http://www.bournemouth.ac.uk/service-depts/lis/LIS_Pub/harvardsyst.html> [Accessed 22 August 1997].

Now Voyager (1942) Directed by Irving Rapper. New York, Warner [Film:35mm].

Porter, M.A. (1993) The modification of method in researching postgraduate education. IN: Burgess, R.G. ed. The research process in educational settings: ten case studies. London, Falmer Press.

Spence, B. ed. (1993) Secondary school management in the 1990's: challenge and change. Aspects of Education Series, 48. London, Independent Publishers.

Whitehead, S.M. (1996) Public and private men: masculinities at work in education management. Ph.D. thesis, Leeds Metropolitan University.

World in Action. (1995) All work and no play. London: ITV, 21st January, [video:VHS]

USEFUL HINTS AND COMMON CONVENTIONS

[useful for researchers interpreting work produced by others - NOT a part of Harvard style of referencing.]

Ibid. (Latin) is used as a ditto instead of repeating the previous reference.

e.g.

1. Lashley, C. (1995) Improving study skills. A competence approach. London, Cassell.
2. Ibid. p.155
3. Ibid. p.170

Op.Cit. (Latin) is used after an author's name to mean the same work as last cited for this author. e.g.

1. Bennett, C. (1996) *Researching into teaching methods in colleges & universities*. London, Kogan Page.
2. Manger, J.J (1995). *The essential internet information guide*. New York, McGraw Hill.
3. Bennett, C. op.cit. p.175.

et al (Latin) commonly used as an abbreviation for 'and others'
e.g. Bennett, H et al. (1990) *Managing Education* . London, Falmer Press.

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Booth, W.C. Colomb, C.G. & Williams, J.M. (1995) *The Craft of Research*. Chicago, University of Chicago Press.

British Standards Institution. (1990) BS5605:1990. Recommendations for citing and referencing published material. Milton Keynes, BSI.

The Chicago Manual of Style. (1993) 14th ed. Chicago, University of Chicago Press.

Fisher, D. & Hanstock, T. (1994) *Citing References: a guide for users*. 2nd ed. Nottingham, Nottingham Trent University.

Fletcher, G. & Greenhill, A. (1995) *Academic Referencing of Internet-based Resources*. *Aslib Proceedings* , 47 (11/12) November/December, p.245-52.

Holland, M. (1996) *Harvard System* [Internet] Poole, Bournemouth University. Available from: <http://www.bournemouth.ac.uk/service-depts/lis/LIS_Pub/harvardsys.html> [Accessed August 22, 1997]

Li, X. & Crane, N. (1993) *Electronic Style: a guide to citing electronic information*. Westport, Conn., Mecklermedia.

Rudd, D. (1994) *Cite Me, I'm Yours or References, Bibliographies, Notes, Quotations ...etc.* Harvard Version . Bolton, Bolton Institute of Higher Education.

Rudd, D. (1995) *Writing a Dissertation. A Brief Guide to Presentation & Literature Searching*. Bolton, Bolton Institute of Higher Education.

Shields, G. & Walton, G. (1995) *Cite Them Right: How To Organise Bibliographical References*. 3rd ed. Newcastle, University of Northumbria at Newcastle, Information Services.

Turabian, K.L. (1987) *A Manual for Writers of term papers, theses and dissertations*. 5th ed, Chicago, University of Chicago Press.

Turner, B. ed.(1996) *The Writer's Handbook 1996*. London, Macmillan.

Appendix 5: Example Exam



Unit: GEOS251 Minerals, Energy and the Environment
GEOS803 Minerals and Energy in a Global Environment

Date: Friday 6 June 2020, 9.50 am

Time Allowed: Two hours plus ten minutes reading time

Total Number of Questions: 15

Instructions:

Answer BOTH PARTS of the examination paper

Part A is worth 60 marks

Answer any eight (8) questions in Part A

All questions in Part A carry the same mark

Part B is worth 40 marks

Answer any two (2) questions in part B

All questions in Part B carry the same mark

Start a new booklet for part B

Materials Permitted:

Paper-based translation dictionaries permitted.

No calculators permitted.

PART A (60 marks)

Answer any **EIGHT** of the following eleven questions in no more than half a page per question. Point-form answers are acceptable. All questions are of equal value.

Q1. Using one example, explain what is meant by a "Cartel".

Q2.

Q3.

Q4. Briefly describe the method of “froth flotation”. How did development of the froth flotation process greatly increase mineral supply?

Q5.

Q6.

Q7. Briefly describe the steps involved in processing and materials handling in the nuclear fuel cycle.

Q8.

Q9.

Q10. Briefly explain how "acid rain" is formed and describe its effects.

Q11.

PART B (40 marks)

Answer any **TWO** (2) of the following four extended answer questions. You may use point-form or tables, where appropriate. All questions are of equal value.

Q1. Discuss if minerals are becoming scarce and if they are should we reduce the mining of mineral reserves. If not, explain what the barriers are of a constant increase in mineral extraction.

Q2.

Q3. Discuss if Australia should reduce its reliance on coal power generation and what alternatives there are to supply Australia’s high energy requirements.

Q4.