Why Write Reports?

• To document information, events, progress
• To communicate and share new knowledge
• To describe a problem and provide a solution
• To evaluate something and enable others to see what action is required
Types of Reports

• Test/Laboratory Report
• Experimental Report
• Field Report
• General Report
• Proposal Report
• Feasibility Report
• Progress Report

Sterility Test for Cosmetic Perfume
Honours/Masters /PhD Report
Work Placement Report
Analogue Electronics used in High Schools
Options for Recycling Waste Materials in a Paper Production Plant
Sections common to most reports

- Cover Sheet/Title Page *
- Abstract
- Table of Contents
- Introduction *
- Body *
- Conclusion *
- References *
- Appendices

* = essential
## Report Organisation: Variations - 1

<table>
<thead>
<tr>
<th>General Report</th>
<th>Lab Report</th>
<th>Field Trip Report</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aim:</strong> Discuss a specific topic and related issues/achievements</td>
<td><strong>Aim:</strong> Describe an experiment and discuss the findings.</td>
<td><strong>Aim:</strong> Describe a workplace/site and discuss issues/achievements.</td>
</tr>
</tbody>
</table>

### Possible Sections

**General Report**
- Introduction
- Historical or Technical explanation
- Achievements/Benefits
- Current limitations
- Recommendations
- Conclusions
- References

**Lab Report**
- Introduction (topic, problem, hypothesis)
- Methods (what was done)
- Results (what was found)
- Discussion (what results mean)
- References

**Field Trip Report**
- Introduction
- Site description
- Resources
- Procedures/processes/related theory
- Achievements
- Issues
- Conclusions
- References
- Appendices
### Report Variations - 2

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aim:</strong> Identify and evaluate current solutions to problems</td>
<td><strong>Aim:</strong> Offer a solution to a problem and a plan for implementation</td>
<td><strong>Aim:</strong> to contribute original knowledge to the field</td>
</tr>
</tbody>
</table>
| **Possible sections:**  
Introduction (purpose, problem, proposed solution & criteria)  
Discussion (for each criteria)  
Describe and justify  
Provide findings/data  
Interpret relative to solution  
Summary  
Conclusions  
Recommendations  
References  
appendices | **Possible sections**  
Introduction (purpose, problem, scope)  
Review of theory/methods  
Approach  
Project plan/statement of work  
Resources  
Conclusion  
References | **Possible sections**  
Introduction (purpose, problem, aim, outline)  
Literature/theory review  
Your Work  
Methods/Approach 1  
Results, discussion  
Method/Approach 2  
Results discussion  
Etc..  
Conclusions  
Future work  
References  
Appendices |
THE PANTHEON

Dome Structure and Efficiency

Jane Smith
Sn: 9800330
Submitted June 5th 2000
Lecturer: Dr Stephen Foster
Summary

This report examines electric vehicle technology (EVT), possible future technological developments, and the environmental, economic and social impacts of EVT. No current electric vehicle can equal the performance of an internal combustion engine. The limitations of lead batteries have resulted in new developments in different types of batteries, such as; AC motors, Hybrid vehicle technology, fuel cells and charging by induction. A country adopting electric vehicle technology will need a comprehensive network for recharging and an increased generating capacity. Reduced emissions are not guaranteed due to an increased demand for electric power stations. However, there are substantial benefits for countries using hydropower. Social attitudes are expected to show a preference for zero emission vehicles. Improved design and increased demand will make electric vehicle technology competitive in the next twenty years.
## Contents

1. **Introduction**  
   1

2. **Smithfield Bridge**  
   1
   2.1. Design and Construction  
   2
   2.2. Significance  
   2

3. **Hell Gate Bridge**  
   3
   3.1. Design and Construction  
   3
   3.2. Significance  
   4

4. **Other Achievements in Bridge Design**  
   4

5. **Conclusions**  
   4

6. **References**  
   5
# General Report Sections

## The Introduction

<table>
<thead>
<tr>
<th>Introduce the topic</th>
<th>1. Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric vehicle technology is currently the focus of much research in the effort to find an alternative to the internal combustion engine.</td>
<td></td>
</tr>
</tbody>
</table>

| State significance of the topic. Often expressed as a problem statement. | Demand for cleaner vehicles has arisen due to unacceptable pollution levels and the obvious need for sustainable and renewable uses of energy sources. |

| Provide an outline of the report. A short introduction like this example would be presented as one paragraph. In some courses your opinion/judgement/key finding of the topic would be included in the introduction. | This report summarises the current limitation of the traditional lead battery and presents new developments in different types of batteries. The potential and the problems in implementing an electric vehicle network nation-wide are also discussed. |
General Report Organisation

The Body

1. Body sections organised in a logical sequence (describe > explain > critically analyse)
   (eg: What is it? How does it work/function? What is useful /interesting about it? How could it be improved/applied?)

2. Headings helpful and informative

3. Definitions, explanations of terms, concepts and claims are clear and sufficient

4. Paragraphs and sentences express ideas well.

5. Visuals help explain/demonstrate information in the text.
5.2. Vibration Isolation Products

After consulting with various manufacturers and distributors, we have found two types of vibration suppression devices that are available for portable CD Players. Both are simple in design but have inherent drawbacks.

1. A foam padded carrying case. The CD player is placed inside the protective case, which is then placed on the seat or dashboard. One obvious limitation is that the unit is free to move about the car. There is no provision to secure the case. This can lead to track skipping and damage to the CD player itself.

2. A mounting bracket (Figure 2). This bracket is made of plastic plates which sit on synthetic rubber legs.

![Figure 2. Mounting Bracket](image)

The bottom plate can be secured to the dashboard. The CD player is held in position by means of a plastic spring-loaded clip.

Comparing these two devices with CD players specifically designed to be fitted into cars highlights their limitations.

The majority of 'in car' CD players utilise a double floating anti-vibration system (Sony 1994). Only the laser pick-up, spindle motor, carriage motor and stage mechanism are isolated instead of the entire unit. This is achieved by using a combination of springs and air dampers. Pioneer have recently switched to silicon oil-filled dampers. This system can be installed between 0 and 90 degrees and still be effective (Pioneer 1997). Some manufacturers of four-wheel drive vehicles recommend this type of CD player be installed into their vehicles.

Foam padding or rubber mounted brackets are better than nothing. However they are obviously inadequate when compared with the vibration suppression of CD players specifically designed for cars.
4. Recent Developments
An example of a recent development in control automation that deals with safety issues is the further integration of control systems into the operation of a car. This has included the utilisation of a "smart airbag"(Bretz 2000, p.91). It has sensory systems that detect the size and weight of the seat's occupant and adjust the air-bag system accordingly (Bretz, 2000). Adaptive Cruise Control (ACC) has been developed in recent Jaguar and some Volvo models. ACC uses microwave radar technology and through the installed sensors is able to maintain a constant distance from the vehicle in front by measuring distance and relative speed (Caplan 2000). A similar system can be used to sense if there is movement in a driver's blind spot. Sensors send a signal that can be relayed to the driver as a flash or a beep if the indicator is activated while a vehicle is in the driver's blind spot (Caplan 2000).
5. Conclusion

Electric vehicle technology will become more competitive in the next twenty years as the demand for zero-emission transport increases and as electric vehicle technology improves. Consequently, many countries will experience major structural changes to their power supplies networks along with an increased number of power stations. While for hydro-electric power the benefits of zero-emissions are evident, the current challenge of electric vehicle technology is to equal the performance of the internal combustion engine.
References


| **Problem:** A statement that clearly states the focus of the experiment. |
| In the practical session a rotor with a known imbalance is to be balanced both statically and dynamically. |

| **Background:** Outline the theory, give explanation and definitions and discuss briefly the procedures used. |
| A rotor is shown to be unbalanced if, when it rotates with some angular speed, its bearing are subjected to induced forces which are not present when the rotor is stationary. The effects of these dynamic forces can only be removed by the addition of balance masses. |

| **Hypothesis:** A prediction of what will happen in the experiment. Should link to a relevant theory. |
| Shigley (1995, p 641) suggests that a rotor which is dynamically unbalanced requires a mass to be added to two separate balance planes to achieve complete static or dynamic balance of the rotor. |

| **Aim- provide the specific focus of the experiment. Include the purpose and scope of the practical.** |
| The aim of this practical is two fold. First to confirm that the rotor cannot be balanced by the addition of mass at only one balance plane. Then the rotor will be satisfactorily balanced by the addition of mass on two balance planes. |

**Notes:** These stages can be in a different order. Always check course requirements for lab reports
<table>
<thead>
<tr>
<th>Outline experimental steps – may need to summarise your original instructions for the practical.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Include materials and equipment – can use lists and diagrams.</td>
</tr>
<tr>
<td>Describe experimental conditions – may also need to mention precautions taken.</td>
</tr>
<tr>
<td>Describe any changes to experimental procedure instructions – give reason why.</td>
</tr>
</tbody>
</table>
| **2. Procedure**  
The power and actual frequency were measured at the following settings: voltage at 9V, Gunn oscillator to 8.5 GHz and power to 1mW range. The measurements were repeated in 0.5 GHz steps up to 11.5 GHz. When the power exceeded 10mW, the attenuator was adjusted until 10mW was obtained. |
The calculated modulus of elasticity is compared to the generally accepted value for different types of materials in Table 1. This comparison shows close agreement between calculated and accepted values.

<table>
<thead>
<tr>
<th>Material</th>
<th>Modulus of elasticity (kN/nm²)</th>
<th>Generally accepted value(kN/nm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild steel</td>
<td>205</td>
<td>207</td>
</tr>
<tr>
<td>Tool Steel</td>
<td>207</td>
<td>207</td>
</tr>
<tr>
<td>Brass</td>
<td>104</td>
<td>97</td>
</tr>
<tr>
<td>Dural</td>
<td>72</td>
<td>70</td>
</tr>
</tbody>
</table>
The aim of the experiment was to investigate the friction loss characteristics of … The friction loss coefficient (K) and the equivalent lengths (Le/D) were used to … and these were evaluated for …

Experimental K values were obtained for standard elbows and …. show good agreement with values quoted by Kinsky (1989). …

There is, however, a significant difference for long radius bends …

This high value suggests there may be a fault such as … It is recommended that …

Theory predicts that at any flow rate, and hence Reynolds, the K and Le/D values for a particular fitting remain constant… This was not observed in the experiment where …

The overall accuracy of the experimental values is strongly questioned. This is due to the small number…. 

For future experiments a minimum of 10 data points should be established for ….
The following proposal contains the team’s concepts and recommendations for developing and constructing a competitive payload delivery system.

The following results that are proposed were obtained by following an accepted systematic and rational method of design applicable for all engineering projects. The problem was to construct a device capable of delivering a payload weighted at 500 g and transporting it 1.5 m and then raising it 0.7 m onto the platform. There are three major components, simplicity, innovation and performance, which were essential through the process of getting the solution. A variety of design concepts were analysed using the matrix diagram in order to develop better solutions. This enabled the team to critically compare and evaluate the different possible solutions.

By thoroughly using a variety of idea stimulation techniques, the team chose two major solutions; a crane system and a scissor lift system. The team strongly believes the two systems were the finest solutions that best meets the requirements. A series of tests and experiments indicated that the scissor lift system was the most suitable system. This was due to a range of superior characteristics, such as its lighter weight than the crane system, simplistic design, general performance, and innovative approach.
What type of report?

The results and conclusions of this research project are based on experiments undertaken using a laboratory-scale, single shear rock re-enforcement test facility that was designed, constructed and commissioned in the School of Mining Engineering at the University of New South Wales.

The test facility was developed to improve the level of understanding related to the behaviour of rock reinforcement elements when subjected to shear. The project examined some of the parameters that can influence the performance of reinforcement elements in order to better manage shear loading conditions and thereby contribute to better design and application of these elements in underground mine environments.

The test results demonstrated that interaction between the different rock reinforcement elements in the underground environment can be markedly different to the properties and behaviour of the individual elements when observed in isolation; that is the rock environment behaves as a system with synergy between the individual elements.
Often, there is a conflict of interest between whistle blowers and their employers. However, there are benefits brought about by whistle blowers towards the interest of the general public. This report aims to highlight these benefits. It will also ascertain how whistle blowing can also be selfish and manipulating. By looking at the case study titled: *The Space Shuttle Challenger Disaster*, we can see that corporations can be prepared to sacrifice whistleblowers to protect the corporation’s interests and reputation. Moral guidelines exist and include procedures that whistleblowers and employers should consider before whistle blowing occurs. The impact of whistle-blowing on the employee and employer and actions that ought to be taken by government and law legislation to protect both parties’ rights. While whistle blowing is not an easy choice for employees, it can be the honorable thing to do particularly when issues of safety arise.
Academic Conventions

• Referencing
• Style
• Visuals
Why Do We Reference?

- **Academic convention**
- A way of showing how you know something in your report. (This requires sources being mentioned in the body of the text and at the end of the text.)

- Gives credit where it is due.

- Avoids plagiarism (i.e. Presenting other peoples’ ideas and information as your own) and penalties you will incur if you are caught!

- Shows the depth and relevance of your research.

- If you use your sources well, you can show that you understand the information.
How to reference – Author date style

1: In text citations  (Author surname date)

Smith (1989) studied……

Studies have shown….. (Smith 1989, Jones 1999).

Quotations


2: In the reference list


Using Sources Well

In most Australian underground coal mines, rockbolts form the basis of the primary roof support system. Previous studies have found however that despite an estimated industry-wide annual expenditure of over $A35 million on rockbolts, it is estimated that 30%-35% of the rockbolts do not perform to specification and may represent some risk to the maintenance of a safe workplace environment (Galvin et al 2001).

**Sources provide the background to the problem/topic**

Extract from Hagan (nd)
Various researchers have noted the importance of minimising resin thickness. For example Franklin and Woodfield (1971) found when using a 19 mm rebar, a resin annulus of 6.4 mm resulted in the most rigid and strongest anchorage system. Durham (1973) suggested an optimum range of resin annulus of between 4 and 6 mm.
Recent work by Hagan (2003) found in a laboratory pull test study that there was little significant variation in rockbolt behaviour with resin annulus sizes of 4 mm or less when using a standard 22 mm rockbolt as illustrated in Figure 2.

……

Similar findings have been made available by equipment suppliers. For example, Yeaby (1991) stated that “in essence encapsulation is reduced by 20% per millimetre of bit diameter” in terms of the reduction in rockbolt performance.

Extract from Hagan (nd)
This finding emphasises the possible need for a quality control system to monitor conformance to specification of rockbolts from the suppliers. Interestingly if the guidelines of the American Society for Testing of Materials were applied, seven out of the sixteen batches or nearly 44% of the batches would not comply. Its guidelines for rock bolts (ASTM, 1995) state the core diameter should be to within 0.38 mm.

Extract from Hagan (nd)
Writing Style

- **Impersonal and Formal** – limit I, we, you
  Apart from these three projects described in the following….

- **Factual - accurate**
  The deck of the Ziggenbach Bridge (Figures 1 and 2) is polygonal in plan to allow for the 25 m radius of curvature of the road. Maillart (1934) mentioned the favourable effect …
• Hypothesises – (What might this mean?)
  The resulting eccentricity may be compensated by a suitable prestressing of the deck beam. Sufficiently stiff behaviour can thus be achieved at least for small live to dead load ratios.

• Specialised Vocabulary - classify
  The bridge deck axis is elliptic in plan; radii of curvature at midspan.
• Logically organised

Abstract

Introduction

The Four Bridge Projects

Review of Maillart’s Design Approach

The present paper describes the four bridge projects and comments on ....

• The deck axis is …
• The deck beam is …
• The arch is …

Many authors criticise… Opposingly, Loerke (1990) argues … Salvadori (1990) emphasises …
• **Comments Politely**
  It is most remarkable how with his experience, insight, and intuition, Maillart mastered the uncertainties regarding the behaviour of his complex structures.

• **Acknowledges Sources – how do I know this?**
  Schlaich et al. (1988) applied this system for a strikingly elegant pedestrian bridge
Avoids wordiness and spoken phrases – be clear & concise

• Slowly but surely, by keeping our noses to the grindstone we are beginning to take the bull by the horns and get down to tin tacks. In this day and age, we need to get the big picture without further delay, so that at the end of the day our bottom line will be none the worse for wear.

• By persevering, we are making progress. However we need a broad view of the problem immediately to meet our deadline.

Adapted from Eunson 1994)
Using Visuals

The study examined several factors including core diameter and the rib height of a rockbolt as shown in Figure 1 as well as length and straightness of rockbolts and degree of surface corrosion.

Figure 1. Core diameter and height of deformation ribs

Taken from Hagan (nd)
## Tables

### Table 2: ITU-R Classification of Cellular Wireless Systems

<table>
<thead>
<tr>
<th>ITU Classification</th>
<th>Wireless Technology</th>
<th>Supported Bit Rate</th>
<th>Switching Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>2G</td>
<td>GSM</td>
<td>10kbps</td>
<td>Circuit Switching</td>
</tr>
<tr>
<td></td>
<td>TDMA - IS-136</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>cdmaOne</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.5G</td>
<td>GPRS</td>
<td>64-144kbps</td>
<td>Packet Switching</td>
</tr>
<tr>
<td></td>
<td>EDGE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IS-95B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3G</td>
<td>WCDMA</td>
<td>384kbps - 2Mbps</td>
<td>Packet Switching</td>
</tr>
<tr>
<td></td>
<td>UWC-136</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>cdma200</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Source: Nyandoro 2001)

Caption is usually placed above the table

Acknowledge all sources
Figure 1: Usability Laboratory (After Dix & Finlay 1998).

Caption is usually placed below the figure

Acknowledge all sources
The Writing Process

- Task Analysis
- Research
- Reading and Note-making
- Documenting your work (facts, data, analysis…)
- Forming an opinion
- Forming a Draft Outline
- Writing…rewriting…rewriting …
- Cover sheet!
## Reading Note-making

**Use a column system**

<table>
<thead>
<tr>
<th>Include bibliographical information – author, year, title, volume/issue no.s, publisher, place published</th>
</tr>
</thead>
<tbody>
<tr>
<td>State the aim or main argument of the source</td>
</tr>
<tr>
<td>Include quotations</td>
</tr>
<tr>
<td>“….” (p.75)</td>
</tr>
<tr>
<td>Summarise/paraphrase in your own words</td>
</tr>
<tr>
<td>Include your thoughts (usefulness, place in report, questions, comments, new ideas)</td>
</tr>
</tbody>
</table>
This article is about the latest developments in Adaptive Cruise Control (ACC) for automobiles.

"Every minute at least one person dies in a car crash" p.40

"The ultimate solution ....is to keep cars from smashing into one another" p.40

The technology exists for sensors and processors that can respond instantly to the distance and movement of other vehicles- cars speed & distance from other objects can be controlled, very expensive –installed in luxury cars(p44)

Bibliographic information


This topic relates to

My topic-'smart car' as use of radar, lidar, microprocessors and expert systems are explained.

Jones' main claim

I agree as it would be a very smart car to do this.

Your thoughts
Using outlines – Writing in layers

• Brainstorm/mind map ideas and information on the topic/task
• Form an draft TOC – outline.
• Prepare a writing plan....
• Write descriptions/intentions for each section
• Write draft sections – order??
• Revisit and revise the above often!
• Know your weaknesses, get feedback & advice
Editing Process

• Check for overall structure - logical? Answers the question/s?
• Check sections – logical?
• Check grammar – correct?
• Check style – consistent?
• Check referencing – in-text & reference list
• Check formatting – fonts, layout,
• Drawer Treatment – 24hr +
• Have I followed the brief and answered all the questions?
Need more Info?

- Check with tutor and course notes
- Discuss ideas with fellow students
- Visit The Learning Centre – C22 – LG North Wing
- Online report writing resources
  - IWRITE - Engineering Reports
  - WRiSE - Science & Engineering
  - Case Study Reports
  - More report writing resources
- Learning Centre workshops/consultations
  - [http://www.lc.unsw.edu.au](http://www.lc.unsw.edu.au)
Student Life and Learning

Student Central
Advice | Referral | Forms

Careers and Employment
Getting Job Ready | Finding Work

Counselling and Psychological Services
Stress Management | Resilience
Individual Counselling

The Hub
Study | Meet | Relax

Student Participation Advisors
Casework | Personal & Study Related Matters

The Learning Centre
Academic Skills Workshops | English conversation classes
Individual help with writing

Student Development International
Specialist Support | Orientation | Mentoring

Student Equity and Disabilities Unit
Adjustments | Discrimination | Harassment

Student Complaints and Conduct
Advice | Resolution

The Religious Centre
Interfaith Services

enriching your experience

www.studentlifelearning.unsw.edu.au


References & Acknowledgements

The following published sources were used in preparing this slide show:


Thankyou to Dr Paul Hagan (Mining Engineering UNSW) for allowing me to use extracts from his draft paper for publication as teaching materials.

Thankyou to Alfa Nyandoro (CSE PhD Student) for use of his table as a teaching resource.

Thankyou to students who gave permission for extracts of their reports to be used as a teaching resource.

Figure 1 was taken from: Dix A, Finlay G, Beale R, 1993, Human–Computer Interaction, Prentice Hall.