

BOARD OF STUDIES
NEW SOUTH WALES

1998 HSC

EXAMINATION REPORT

Design and Technology

Including:

- **Marking criteria**
- **Sample responses**
- **Examiners' comments**

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1998 HIGHER SCHOOL CERTIFICATE

DESIGN AND TECHNOLOGY ENHANCED EXAMINATION REPORT

Design And Technology Candidature

- 2/3 Unit (Common) = 4199
- 3 Unit (Additional) = 510

Nature of the syllabus

The 2/3 Unit Design and Technology syllabus was approved by the Board of Studies in 1992 for implementation in 1993 and initial examination in 1994. The syllabus was amended in 1993 for the purpose of Pathways, and implemented in 1994 for initial examination in 1995.

The Design and Technology syllabus includes a Preliminary 2/3 Unit (Common) Course, an HSC 2/3 Unit (Common) Course and a 3 Unit (Additional) Course.

The 2/3 Unit (Common) Course involves a Related Study, a Comparative Case Study, Design Projects and a Major Design Project.

The 3 Unit (Additional) Course involves a Core and a Specialised Study.

The syllabus focuses on the study of technology and its applications through design in domestic, community, industrial and commercial settings in rural and/or urban environments.

It provides opportunities for candidates to:

- become enterprising, creative and adaptable
- develop the ability to design in response to human needs and wants
- develop attitudes and skills which will empower them to initiate and respond to change
- develop confidence and competence in the management and use of materials, tools, and techniques
- develop thinking and practical skills, and apply theoretical concepts to the realisation of practical solutions
- develop an understanding of a range of technological activities and their applications in a variety of enterprises
- develop a critical awareness and appreciation of the impact of current and emerging design and technology on the quality of life
- develop environmental and social responsibility in design, the use of technology and resource management.

Content of the courses

The Preliminary 2/3 Unit (Common) Course includes the Related Study, the investigative component of the Comparative Case Study, Design Projects and a proposal for the Major Design Project.

The Preliminary Course is considered to be assumed knowledge for the HSC Course.

The Related Study is addressed in the HSC 2/3 Unit (Common) Course through the Comparative Case Study and the Major Design Project. It involves content acquired in various ways. It deals with designing and producing, using resources, management, communication, marketing, issues relating to organisations as well as social, environmental and other aspects of design and production. Learning experiences extend from school-based activities into the world beyond school.

The Comparative Case Study is made up of two components. The first component involves an investigation of two organisations, and is carried out in the Preliminary Course. The second component involves the comparison of the two organisations, and is carried out in the HSC Course.

The Major Design Project is a Design Project which is submitted for the Higher School Certificate Examination. A proposal for a Major Design Project is developed in the Preliminary 2/3 Unit (Common) Course. The Major Design Project is completed in the HSC 2/3 Unit (Common) Course.

The 3 Unit (Additional) Course includes a Core and a Specialised Study.

In the Core candidates will investigate design and technology through a critical analysis of:

- innovation in design and technology
- success of innovation in design and technology
- entrepreneurial activity in design and technology.

The Specialised Study includes both the research and development of a concept related to the 2/3 Unit (Common) Major Design Project and the documentation of all steps involved in the process.

The Specialised Study will result in the development of ONE of the following options:

- an innovative application
- a new or improved resource
- a manufacturing system
- a marketing strategy.

The written documentation of the Specialised Study is submitted for the HSC Examination.

Procedures and Guidelines for HSC Marking

2/3 Unit (Common) Examination Specifications

The 2/3 Unit (Common) examination consists of TWO parts:

Part I: Written paper (40 marks)

Time allowed: 1 1/2 hours (plus 5 minutes reading time)

The written paper is divided into THREE parts:

- | | |
|------------------------|---|
| Section I (10 marks) | Section I consists of TEN multiple-choice questions.
All questions are compulsory.
All questions are of equal value. |
| Section II (15 marks) | Section II consists of ONE structured short free-response question.
The question is compulsory.
The question is based on the Comparative Case Study and Related Study. |
| Section III (15 Marks) | Section III consists of THREE structured extended free-response questions.
Candidates attempt ONE question of the three.
All three questions are of equal value.
Each question is based on the Related Study and the Major Design Project. |

In Section I, multiple choice Questions 1-10 are machine marked.

In order to mark Section II and Section III of the 2/3 Unit (Common) written paper and the 3 Unit (Additional) written papers, HSC markers develop accepted responses and marking criteria for each question. This is achieved through a process of discussion and pilot marking. The marking criteria are developed to include all aspects of the question and provide for a full range of marks, from zero to full marks. The marking criteria are contained in this report.

The free-response questions in the 2/3 Unit (Common) and 3 Unit (Additional) written papers are double marked.

Part II: Major Design Project (60 marks)

Each candidate undertakes, on an individual basis, a Major Design Project for submission for the HSC. The Major Design Project includes the submission of:

- a product, system or environment
- a folio documenting the Project Proposal, Project Management, Project Development and Realisation, and Project Evaluation related to the designing and production of the product, system or environment.

At Pilot marking, markers are trained to mark all types of projects according to the marking criteria as set out in the KLA Handbook.

HSC markers travel to schools or centres to which the project has been submitted. In cases where it is essential that the project requires viewing or operation in situ, markers will travel to the candidate's home or a location at which the project has been set up for marking.

Pilot marking and HSC marking of each candidate's Major Design Project takes place during late Term 3. However, photographic evidence in the folio, of the Project in its final position, will suffice to 'prove' the relationship of the project to the design brief. Wherever possible, the project and folio should be marked at the school the student attends.

Each marker is supplied with a checklist devised from the marking criteria set out in the KLA Handbook to assist in ensuring that each candidate has covered the criteria of the Major Design Project. The checklist used to assist the markers is contained in this report.

The Major Design Project is marked holistically. Markers examine the product, system or environment (PSE) and the folio together. Decisions made by candidates in the conception and development of a Major Design Project are evidenced in the PSE and mirrored in the folio.

Project Proposal (0 marks)

The project proposal should be concise and succinct. The proposal is often inadequately identified in terms of needs, areas of investigation and criteria to evaluate success and, consequently, many candidates were not able to reflect this in their evaluation section. Long-winded, repetitive and inappropriate responses were still common. Many candidates spent far too much time 'setting the scene'.

Project Management (15 marks)

The better candidates showed evidence of planning and predicted their actions before undertaking the realisation of their projects. They then evaluated their management throughout the development and realisation, and after the project was completed. Those who did well in this section had generally followed well laid out, clear plans; those who displayed poor management skills often presented incomplete projects.

A number of candidates failed to show evidence of management in their folios, and this was usually reflected in the realisation of the project, system or environment. There was little or no evidence of design development. Candidates simply stated 'I am going to make 'X' project with 'Y' material'. In such cases folios were generally disorganised and of poor quality.

Time, Action and Finance Plans also have generally improved. Unfortunately, however, many were still often in the form of a diary of past events, rather than of prediction and evaluation. It was obvious that some were written after the project was completed. Many action plans failed to identify design, research and testing and only documented the construction of the project, despite the fact that such management activities were evident in the product, system or environment.

Many candidates still could not distinguish between a finance plan and a list of receipts for resources. Very few candidates actually provided any evidence of forward planning in regard to finance, or justification of how they had arrived at a 'projected cost'.

The identification and justification of resources used was often poorly handled. Many candidates identified the material resource that they used but failed to justify why they selected it, rather than alternative materials which may well have been available. Many candidates do not acknowledge other resources such as tools, techniques, energy, finance, information, time, skills and human resources such as teachers, parents and industry. Consequently, those candidates failed to address many important syllabus requirements.

Project Development and Realisation (38 marks)

Candidates generally did quite well in this section. Some, however, still failed to show any evidence from the developmental stages and their project was simply a realisation of their first and only design.

Good candidates based their project on relevant research, with appropriate testing and experimentation included and clearly identified. Decisions about the selection of materials, tools and techniques were related appropriately to the original project proposal and to the criteria for evaluation. They also included evidence of testing through models, samples, photographs, videos or other appropriate mediums.

In many cases, however, evidence of research was weak and often took the form of a folio or folios full of brochures, without any identification of the relevance of aspects of these brochures to the project. Candidates need to keep in mind the importance of evaluating research and experimentation.

The majority of candidates must have tested and experimented to achieve the standard of work presented, but many showed no record of either in their folios. Testing and experimentation were often included as an afterthought rather than as a means to an end solution.

Project Evaluation (7 marks)

Evaluation often proved to be the most difficult aspect for the candidates. Some candidates documented their evaluation in terms of liking it, being happy with the result or learning a lot. Although these are worthy sentiments, they do not address the examination evaluation criteria. Evaluation needs to be ongoing throughout the project, as well as at the end, and it should reflect the criteria for evaluation identified in the Project Proposal. This was made easier in cases where the candidates had assessed and analysed the needs of the target market, personal or wider, and then evaluated all aspects of their project according to those needs.

Good candidates not only provided ongoing and final evaluations but also had other people (eg peers, experts and potential end users) evaluate both their design development and their solution. Professional evaluations were included in some folios, where appropriate.

Quality of evaluation continues to vary from the excellent to non-existent. Evidence of evaluation throughout the project was often difficult to find because of poorly organised folios. Some folios included final evaluations, but often there was little or no evidence of ongoing evaluation. Candidates had obviously evaluated and made decisions throughout the project but had not bothered to document the facts.

Functional and aesthetic criteria were rarely evaluated well, and many candidates seemed to have a poor understanding of the meanings of these terms. Similarly, the impact of their project on society and the environment was rarely addressed.

There are still too many candidates presenting folios that are far too long, containing material that bears little or no relationship to the actual project. The candidates need to present the design folio in a clear and concise way. They need to be able to identify the difference between 'padding' which is irrelevant and material that communicates their design ideas.

3 Unit (Additional) Examination Specifications

The examination consists of TWO parts:

Part I Written Paper (20 marks)

Time allowed: 1 hour (plus 5 minutes' reading time)

The written paper consists of TWO sections:

Section I (12 marks) There is ONE compulsory extended free-response question drawn from the Core.

The question may involve candidate response to stimulus material.

The question is answered in a separate writing booklet.

Section II (8 marks) There are THREE structured short free-response questions.

Candidates attempt ONE question only.

All the questions are of equal value.

The questions are based on the Core.

The question is answered in a separate writing booklet.

As with the 2/3 Unit free-response questions, the HSC markers develop accepted responses and marking scales for each 3 Unit question. All candidate responses are double marked.

Part II Specialised Study (30 marks)

The Specialised Study is sent to the Board and is marked at the same time as the written paper is marked in November.

Marking is kept precisely to the marking criteria as set out in the KLA Handbook. Each report is marked by two teams of markers.

It is stressed that candidates must keep to the word limit of 2000 words. The supporting materials, 2/3 Unit Major Design Project folio extracts, maps, charts, drawings, computer print outs, video or audio tapes are not included in any word count. Only words relating to the study itself are counted. If the study is substantially over 2000 words, the study is brought to the attention of the Supervisor of Marking who evaluates which section of the study is excessive in length and considers how much the candidate is advantaging themselves by the excessive length. In discussion with senior markers, and assistant supervisors of marking, the supervisor of marking makes an adjustment accordingly. Every case is viewed individually.

Less than 4% of Specialised Studies were considered to be excessive in length in the 1998 HSC. However, many of these studies were as long as 6000 words. It was considered that candidates who exceeded the word limit were advantaging themselves over a candidate who had abided by the rules in the KLA Handbook and kept to the word limit.

Major Design Project (60 marks)

Examiners' comments

Greater care should be taken to follow project certification procedures. It is vitally important that the teacher or supervisor of the candidate keep a record or diary of progress of the work submitted by each candidate to help substantiate the authenticity of the project. Projects often have insufficient monitoring when built away from school. It must be noted that the major part of the project should be made at the school that the candidate attends.

Graphics need to be relevant to the sequential development of the project. Candidates often failed to show development of ideas — from concept sketches to final design drawings. Working drawings were rarely presented in the folios. When using computer generated folios, candidates need to bear in mind that the fonts and styles they select need to be easily read and interpreted — some of the more artistic fonts and colours used proved to be extremely difficult to decipher. Many candidates need to be given instruction on how to use the spell and grammar checker facilities in their word processing and desktop publishing programs. Students need to be instructed on the importance of proof reading and correcting their work.

Practical production skills were, at times, of a very high standard, but many candidates compromised the final quality of their PSE by spending excessive time on their folio. The evidence of the practical skills was usually quite well documented, often in the form of labelled photographs.

Evidence of safety considerations should be addressed in the candidates' folios and be evident in their PSE. It was still a concern to see photographic evidence of candidates working on their projects in unsafe environments. Protective safety equipment should be worn by candidates when necessary and safe work habits must be followed. Candidates should have electrical projects tested and certified as safe by a licensed electrician. The provision of earth leakage safety cutout power supplies has increased.

2/3 Unit (Common) Examination

Section I (10 marks)

Question Number	Correct Answer	% of candidates responding correctly
1	D	98
2	B	84
3	D	76
4	D	81
5	A	76
6	C	66
7	B	78
8	D	42
9	A	83
10	C	66

General Comments

Multiple-choice questions require careful reading and reflection before an answer is given. Candidates are reminded that they are to select the alternative A, B, C or D that best answers the question.

Section II (15 marks)

Question 11

The Lighting Company is a fifteen-person organisation located on one site that designs, manufactures and installs lighting products. Using your understanding of organisations derived from your comparative case study, answer the following:

- List THREE important issues that would impact on the structure of the organisation The Lighting Company.
- Justify the selection of these issues using your understanding of the structure of the two organisations that you have studied.

Candidates needed to be able to identify issues which directly related to the structure outlined for The Lighting Company (eg management structure, workforce, physical environment, work practices), rather than simply three issues affecting any organisation. Better candidates were able

to identify appropriate issues, which in part (b) could be justified by drawing on knowledge gained from the study of other organisations but directly related to The Lighting Company.

Example 1

Issue 1 Location /physical environment

Issue 2 Environment/Ecological

Issue 3 Financial costs

Issue 1: Location – determine whether the location allows or promotes sales (eg. can it be easily reached by target market). This would impact on the structure as if the market cannot physically reach the site, sales will drop and the structure will include less employees or staff.

Issue 2: Environmental – waste and resources must be used effectively to reduce financial costs and costs to environment. In terms of impacting on structure if resources are depleted through resource wastage (eg. paper) designers may become unemployed and organisation will fail due to not having the resources needed.

Issue 3: Financial issues – become important as the company may fail if budgets and money plans are not employed. The structure may include more or less employees to produce more products, depending on sales and the product need.

This is an example of an above average response where the student has used an understanding of their studies of organisations to justify the selection of issues. This candidate uses general terms that imply impact in relationship to The Lighting Company.

Example 2

Issue 1: Management

Issue 2: Building size

Issue 3: Safety

Issue 1: The management theory that 'The Lighting Company' adopts will have a great impact on the structure of the organisation. With only 15 employees, 'The Lighting Company' should base itself around a Total Quality Management theory where everyone gets an input into production, and quality is the main priority.

Issue 2: The size of the building is another issue that will impact on the structure of the organisation. 'The Lighting Company' only has 1 building, with 15 people working there and no doubt lots of machinery and office space, 'The Lighting Company' must be cautious not to cramp employees, which will affect the product.

Issue 3: Safety would be a very important issue in an industry such as this. The Lighting Company should follow the procedures of the Occupational Health & Safety Act to ensure employees and customers are safe with the store. This would have a great impact on the structure of the organisation if they failed to follow procedure.

This is another excellent response where the candidate has chosen three issues that directly impact on the structure of the organisation. Again the response is related to The Lighting Company from knowledge gained in studies of other organisations.

(c) Propose a suitable organisational structure for The Lighting Company. Consider the issues that would assist The Lighting Company in designing and manufacturing new products. Within your structure, indicate the key activities.

Example 1

Management – takes care of interrelations with other companies and with works

Designer – designs new concepts

Builders and workers – manufacture the designs

Installers – install manufactured products

Example 2

Manager – accounting pay system and general managing duties

Designers – design new ideas of lights

Manufacturers – produce the new products

Sales assistants installers – general sale duties (fit the lights into homes and customer service) industrial plants/shops, must be an electrician

These are simple but effective methods to convey the organisational structure and activities. The example below, however, is a poor example – the candidate has not analysed the question in terms of organisational structure, and key activities. Candidate only looks at design/manufacture processes, and has not analysed the question.

Example 3

There needs to be a variety of design sketches

Survey consumer needs and wants in a lighting product.

Select from these designs and manufacture samples, if they sell, make more, if they don't, select another design etc. promote your different designs and ask people to comment on them.

Example 4

Flat management structure would be appropriate with low chain of command (levels of hierarchy). Manager/owner (manage the company) communication will be better, with high employee input.

Work Groups (cells)

Design – people will work together and incorporate

Manufacture – producing of designs, their ideas

Install – installing of products at customer's home

This is an above average response, in that the structure is both named then clearly outlined in terms of the key activities of each section of the structure.

Large numbers of candidates failed to indicate the key activities within their structure. Often the structure outlined was unsuitable for this small organisation. They included Boards of Directors, CEOs, managers including sales, market, R & D, OH&S, supervisors and then staff.

(d) The Lighting Company considers issues of sustainability and impact on the environment when designing, manufacturing and installing its products. Compare and contrast how the organisations that you have studied deal with issues of sustainability and impact on the environment.

Example 1

Both organisations we studied have little impact on the environment because they have looked closely into their impact; each organisation recycles waste and/or donates it to local charities so all waste is used; all materials are used because they are sustainable and don't hurt the environment; each organisation has surrounded their premises with trees and shrubs to cut down on what little noise is produced and make the grounds look cleaner and healthier for the environment.

In this above average response, the candidate effectively uses their case study knowledge to compare and contrast the different issues of sustainability and impact on the environment of each company.

Example 2

Any company if wishing to become successful should consider the impact on the environment by its product. Manufacturing the product should be conducted in an unpolluting way, as should the instalment of the product. This pollution could be cut down in the designing process.

This candidate has taken a different approach to sustainability, ie. to the company's ongoing success, through consideration of environmental issues in the designing and production processes. Unfortunately only one of the organisations studied has been used and no contrast been made.

Example 3

Organisation 1, similarly to 'The Lighting Company' considers environmental impact of the chemicals used in its products and must adhere to strict company policies and law when making new products. In manufacturing organisation #1 does filter the waste chemicals to have minimum damage to one environment. In contrast, organisation #1 does not use ecologically sustainable

resources – it also uses recyclable plastic bottles – which is harmful for the environment. Organisation #2 does not consider sustainability, as it uses gas for cooking and uses coal (through electricity production). Most ingredients are sustainable ie. wheat, flour etc. The business does consider the impact of their packaging (boxes) on the environment, by making them recyclable. In these ways, organisation #2 does not consider the environmental impact etc to the extent that ‘The Lighting Company’ does.

Note: Organisation #1 = Schwarzkopf, Organisation #2 = The Local Cheesecake Shop.

This is also an above average response.

(e) Identify how each organisation that you have studied responded to Occupational Health and Safety issues.

Example 1

Firstly at least 5 employees would need to undertake an occupational health and safety course so they could be designated as OH & S officers. Then the use of the acronym ADOPT- Avoid hazards, design workplace to eliminate hazards, organise workplace to minimise hazard exposure, protective instruments need to be supplied such as gloves, goggles, overalls, ear muffs etc. Train staff to comply with safe practices such as lifting, pushing, welding etc. Then constantly every 6 months review the current safety trends/practices and make employees aware of any changes.

In this above average response, the candidate covers all areas of OH & S ie Health, Welfare and Safety.

Example 2

Organisation 1: Telstra has a safety committee that deals with outdoor (labour) or office (indoor) work and gives advice and rules to all staff to prevent accidents in the different work places.

Organisation 2: Bt is a much smaller company that has no real risk (especially in Australia) because all work is indoor (office) but safety is a precaution that is aware to all staff by booklets given to staff through training.

This is a general average response.

Example 3

Organisation 1: ‘Uniforms R Us’ has a OH & S representative who inspects machinery and tools in the workplace for possible hazards. The use of large safety signs around the workplace educates the workers of safety procedures. The OH & S representative provides safety manuals to all workers.

Organisation 2: Sara Lee implements OH & S procedures. Workers and employees must wear protective clothing and use tools or machines correctly. Worker safety is of major importance to the company so implements the OH & S policy.

This is a good response outlining OH & S procedures.

(f) The Lighting Company is establishing its management system for Occupational Health and Safety. Indicate how you would manage the implementation of this process.

Example 1

Issuing each employee with a copy of the 1983 OHS act is the first step, as every worker is liable if they do not comply. A thorough inspection of all machinery, equipment and processes at work is necessary to determine any risks, and then to set about rectifying them. This may cause some big changes to occur – so a Safety Officer may be hired: this company has only 15 employees – if it had over 20 then an OHS committee should also be formed.

This above average response shows how the candidate covers all areas, showing an understanding of the OHS Act.

Example 2

I'd manage the implementation process of a OHS system in these ways:

- *orientation meeting with all 15 members of the company to outline the firm's policy's. The policies would complement that of the OHS Act.*
- *devise other means of sending the health and safety message adopted. ie. labels on machinery (do's and don'ts) safety lines on floors, OHS policy on walls etc*
- *regular (quarterly) evaluation seminars to see if implementation is positively effecting staff and workplace.*
- *generally, the whole process would involve strict enforcement of rules and the importance of OH & S.*

Example 3

Firstly, a volunteer would be selected from the 15 employees to represent OH & S issues. This individual should organise meetings or interviews with employees to discuss any issues they see as dangerous in the workplace. Along with this person's individual investigations, fundings should be allocated to fix any OH & S dangers eg old machinery. Once all mending is completed, the OH & S representative should teach the employees methods that will reduce accidents ie proper electrical dealings/workings of their machinery. Policies should then be written and their adherence checked regularly (monthly). Work cover should also be taken out for all employees.

The above candidates also outline an appropriate procedure.

Poor responses were those in which candidates showed no knowledge of how to manage, or of a system, eg

I would advise that all members of the workplace would be covered for the safety.

Question 11 Marking Criteria

(a) Issues	
(b) Justify Issues	
(c) Structure	Name or Drawing
	Key Activities
(d) Issues	Company 1 Sust and Impact
	Formal Cmp/cont
	Company 2 Sust and Impact
(e) OH and S	Company 1 (H, W and S)
	Company 2 (H, W and S)
(f) OH and S System	
TOTAL /20	

Question 12

You have been asked to develop a strategy to manage the redesign of a garden tool, a household appliance, or a software program, each of which is nearing the end of its marketable life.

- (a) Indicate specific product from ONE of the groups listed above.
- (b) Identify at least FOUR issues you would consider when preparing the management strategy.
- (c) Nominate ONE of the issues you identified in part (b) as being important, and explain why, in terms of the product chosen.
- (d) The strategy that you suggest will identify a number of management options. How would you go about prioritising the options? Justify your decisions.
- (e) Explain the importance of continual evaluation with reference to the development of your Major Design Project and the redesign of the project specified.

Examiners' Comments

Typical Excellent Range

- (a) A relevant product was named.
- (b) Four issues relevant to preparing a management strategy were clearly identified.
- (c) An issue was nominated and discussed with reference to the product named in (a). The answer gave a justification of why research was important to the management strategy being prepared for the product.
- (d) In this part the candidate named several processes by which management options could be prioritised, for example: surveys, interviews and consumer feedback. The priorities were listed and a logical argument for the order in which they had been placed was presented.
- (e) The candidate made reference to both the MDP and the product specified in part (a). Adequate reasons were given for the continuous evaluation of the project. The candidate explained the need to monitor quality and time.

Example 1

(a) *Kettle*

(b) *Issue One – What changes or adaptations must be made to the original design to enhance it and extend its marketable life?*

Issue Two – How much money is going to be spent to help develop this product further and what aspects of the design will most of the money be spent on?

Issue Three – How much time do we have to carry out the desired modifications?

Issue Four – What forms of research will be conducted and what evaluation methods will be used to determine the success of the final product?

- (c) *I think that the fourth issue in part (b) is the most important of all the issues put forward. I think it is important because if this issue is not addressed then the success of the product cannot be determined.*

It is absolutely necessary in the design of any product, system or environment that suitable evaluation methods be established. Suitable evaluation methods for the kettle include direct consumer opinions, surveys, etc. Even the smallest fault on a product can break an otherwise good product. With reference to the kettle, there could be something odd about the look of it, or perhaps it is awkward to handle and pick up. Often designers don't pick up the small abnormalities which is why evaluation and research need to be carried out.

- (d) *Management options for the redesign of the kettle could and would, mostly include research through surveys, interviews, consumer feedback, etc. There are also management issues of cost, time, resources and work power. To go about prioritising these options, a good manager must first realise that all of these options should interact with each other to make a good design as cheap as possible to produce, in as little time as possible.*

To list these options in priority, I would put resources first. Resources refer to research and evaluation procedures. They also refer to the work power available. Secondly, I would put cost as cost regulates the sort of resources that are accessible and reasonable. Although cost in itself is a resource, I class it separately from the others as it is a parameter that must be worked within. I put time last on the list of priorities, not because it isn't important; – it is, but it is the least important of the options given. It is of no use if the job can get done in next to no time; – it wouldn't be high quality and quality is what is being looked for in this product.

- (e) *Continuous evaluation throughout the whole design process is the most essential ingredient to a successful design. Continuous evaluation helps you to look at the project at different points in time during its design and it allows you the privilege of altering designs, perhaps processes and methods. Without continuous evaluation of the kettle, small imperfections may not have been picked up or identified.*

Continuous evaluation made sure that the design of my MDP was finished on time since I was able to keep track of where I was up to and to know when I needed to speed up.

Continuous evaluation allows mistakes to be picked up early and modifications made so that by the end of the design process, you have a product, system or environment that has undergone continual refinement and is of a high quality.

Examiners' Comments

Typical Above Average Range

- (a) A specific product was named.
- (b) Not all of the issues given by the candidate related adequately to the preparation of a management strategy. However, since more than four were given, the candidate was able to score good marks for this section.
- (c) This was not considered to be a bad response. The candidate referred to the product in (a), but did not explain in terms of management strategy.
- (d) By stating that the options could be compared against the available technologies, finances and skills, the candidate suggested a method by which these options could be prioritised. However this was not fully developed and justified.
- (e) The issue of continual evaluation was linked to both the MDP as well as the redesign of the product specified. However the explanation was vague and did not provide the necessary specific reasons for the importance of continual evaluation required.

Example 2

- (a) *The redesign of an action category computer game. The game is currently on the consumer market and is nearing the end of its marketable life.*
- (b)
 - *How will the redesign of the product be evaluated is an issue that would need to be considered.*
 - *What has led to the product nearing the end of its marketable life?*
 - *Who will redesign the product and what limitations or guidelines need to be set before commencement?*
 - *What is the budget for the proposed redesign of the computer game?*
 - *Target market will be considered; whether it needs to be redefined or not.*
 - *Ethical issues will need to be considered, including suitable ratings placed upon how violent the game is for example.*
- (c) *Ethical issues would be the most important factor mentioned above in relation to the redesign of the computer game. This is due to the fact that computer games possess great addiction and therefore influence upon their intended market. If the game has violence in it, consideration must be made upon whether it is suitable for certain age groups in society. And as the younger generation of society are the most popular market for computer games, ethical considerations become further important as youths are much easily influenced than adults. In terms of the production, action packed computer games often have violence in the game play which is why ethical issues must be considered when redesigning this product.*

(d) *After suggesting a strategy, management will have available options such as whether to go ahead with the strategy and begin production, testing, further research, marketing or not to go ahead with the strategy at all. Options such as these could be prioritised by looking at the strategy with regards to available technology, financial capacity and available skills and then if these factors are OK, production and testing of the strategy may begin. If not, then priorities such as further research or a different strategy may have to be developed.*

(e) *Continual evaluation is important with regards to any design project including the Major Design Project and the redesign of the computer game mentioned above.*

With reference to the redesign of the computer game, there will be many steps of evaluation that will need to be undertaken in order to the final product is successful on its target market. Therefore market research should be undertaken to include possible ideas of the new game and to see whether or not it will be successful on the market. Because once the game is produced, if no prior evaluations or market research surveys are conducted, there will be very little to no guarantee of the product's success. Continual evaluation before the product is launched will provide good information on the progress of the new design and will give a guideline of the product's success once launched.

Examiners' Comments

Typical Average Range

- (a) A specific product was named.
- (b) The candidate listed aspects of design without describing how they would be issues. In giving a list such as this, the candidate did not demonstrate an understanding of what a 'management strategy' might be.
- (c) The explanation included references to the product given in (a) but failed to say why the issue chosen was the most important of those listed and to say how it would apply when preparing a management strategy. For example, the candidate could have suggested that a well designed garden rake would be a highly saleable and hence profitable item.
- (d) In this response, the candidate described a method of prioritising options but made no clear distinction between 'ethics', the 'characteristics of the business', 'ergonomics' or 'benefits to the customers'. There was no justification of how these apply.
- (e) The answer here referred to both the MDP as well as the specified product. It identified aspects which might be evaluated (which is irrelevant to the question asked) and failed to explain why continual evaluation is important.

Example 3

(a) A garden rake.

(b) Four issues to consider for the management strategy would be:-

Materials – Reliability

Safety – Maintenance

Ergonomics – Shape/Size

Aesthetics – Storage

Cost – Environmental Impact

(c) *Ergonomics would be the most important consideration. Many people of different shape, size and age group will be using the garden rake. It is therefore important that the rake be easy and comfortable to use. It should be lightweight and ergonomically built so as to be easy on all the body parts. Garden work is often very strenuous on the body, no matter what your age and ergonomics for the garden rake is the most important issue.*

(d) *Prioritising management options should be based on the ethics and characteristics of the business. The major options should be based on ergonomics as it is the most important issue. A system could be introduced whereby all options are given a rating out of ten and decided upon by management. Prioritising should be based on the benefits for all the customers as well as the business itself.*

(e) *Continual evaluation is vital to the success of any design project. By using evaluation techniques, many of my design and technological techniques were decided upon. Testing of solutions of problems is extremely beneficial as you are able to see for yourself and through others where adjustments need to be made. In my MDP I was able to test various types of drawings and techniques for my model.*

For the redesign of the garden rake, various areas should be continually evaluated such as:

The materials used – they should be soft on the user but durable

The functionality – it should perform the tasks set out in the design brief

The aesthetics – the rake should be pleasing to look at.

Various techniques should be evaluated continually to ensure the best possible design end product is achieved.

Examiners' Comments

Typical Poor Range

- (a) No specific product was named.
- (b) The candidate gave a list without demonstrating an understanding of the question and without indicating how these would be issues relevant to a management strategy. Some marks nevertheless were awarded to this section.
- (c) Although the candidate related 'strength' to the product chosen, namely a 'garden tool', he/she failed to address the question asked. The candidate did not explain why the issue of 'strength' is important to the management strategy.
- (d) The answer given here demonstrates a complete misunderstanding of the question asked.
- (e) Here the candidate again failed to address the question though the reference to testing (presumably to make ongoing improvements) attracted a mark.

Example 4

- (a) *A garden tool.*
- (b) *1. Strength*
2. durability
3. safety
4. cost
- (c) *Number 1 – Strength*

I've chosen strength because with some garden tools that you buy last at least 4 – 6 months and the main cause is that it snaps or it rusts up and breaks. I think strength is the most important because people don't want to keep going out to the hardware store and having the tool break on them the first time that they use it.

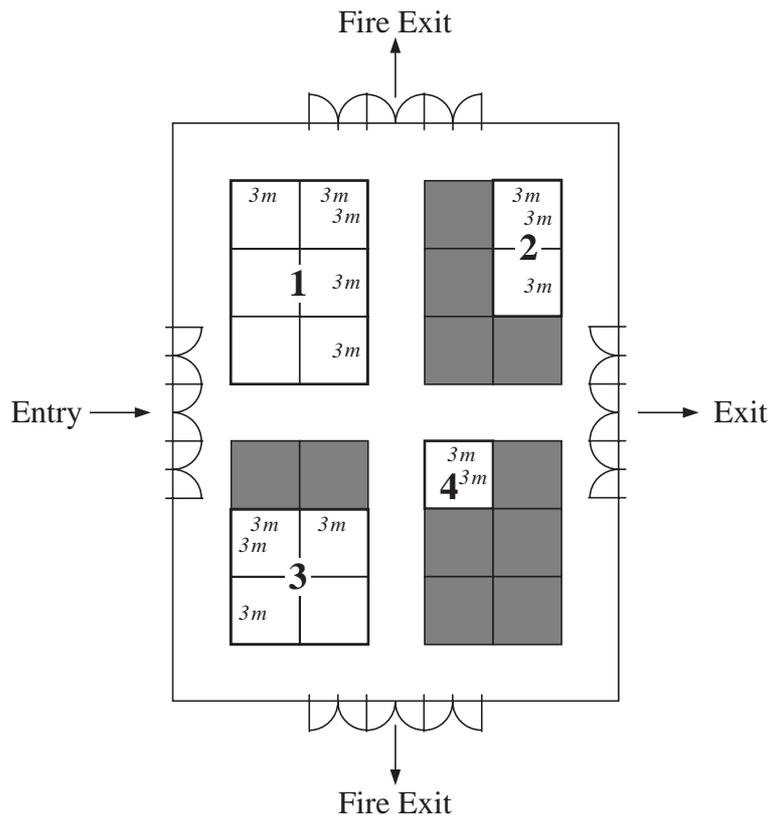
- (d) *By stating the fact that people don't want to waste their money on something that is going to break the first time they use it.*
- (e) *Manufacturers can test stronger woods of even stainless steel can be improvised on the tool. Just by testing different materials can make a tool that use to break the first time you use to use it, to, a tool that can last you until the next century.*

Question 12 Marking Criteria

(a)	Specific product named eg. shovel, toaster, PC game.
(b)	Issues: eg management of finance, resources, time, etc. Also: skills/number of employees, time and financial constraints, markets and technology available, environmental issues, copyright issues. Lists: price, market, design, ergonomics, resources, aesthetics.
(c)	Issue related to the product in (a) Justification: plausible reason given. eg finance = need to show a profit; technology = need to work within the limits available; copyright issue = danger of litigation.
(d)	Options listed: eg cost, time, finance, people, materials, resources, etc. Evaluation tool named: eg projected marketing trends, economic constraints; Process named: eg team meetings, use of surveys, consultants Justification attempted.
(e)	Evaluation with respect to MDP and project specified. Two reasons given. eg to make ongoing improvements, monitor quality, identify problems, meet deadlines.
TOTAL	

Question 13

You have been asked to display your Major Design Project in an exhibition, field day or trade fair. A floor plan of the exhibition area is shown below. The exhibition space options 1, 2, 3 and 4 are shown below. All other exhibition spaces are occupied.



- (a) Identify and explain the criteria that you should consider when you design your display.

Examiners' Comments

The better candidates identified numerous criteria in point form and then clearly explained the relevance of each criteria in relation to the display. Better responses were specific rather than general.

Typical Good Response

- *The size of the product in relation to the display*
- *The display must be eye-catching and colourful so that people look twice*
- *because I made a 'collapsible' boat trailer. The area around the display will be to do with water sports as well as pictures of the trailer in operation and how to collapse it*
- *The display must hold people's attention or provoke interest so they will stay there for a period of time and fully understand the product and its use*

Typical Fair Response

- *Looks good*
- *Clearly identifiable*
- *Information available*
- *Information relevant and understandable*
- *good use of space, not too spread out*
- *Catches attention*

Poor answers focused on their MDP not on the design of the display or did not identify specific criteria.

(b) Nominate the exhibition space option you have selected.

The majority of candidates nominated an exhibition space and gave a good reason to explain their choice of space. Their reasons were well expressed.

Typical Good Response

The exhibition space I selected was (2). I did this not because of its position but due to the size of it being 3m x 6m and my project being 4m x 2m. Any bigger and my project may have been lost in the display and any smaller and my project would not have fitted.

Some candidates misunderstood the intent of the question by choosing a part of one of the nominated spaces, eg the bottom right hand corner of space 1.

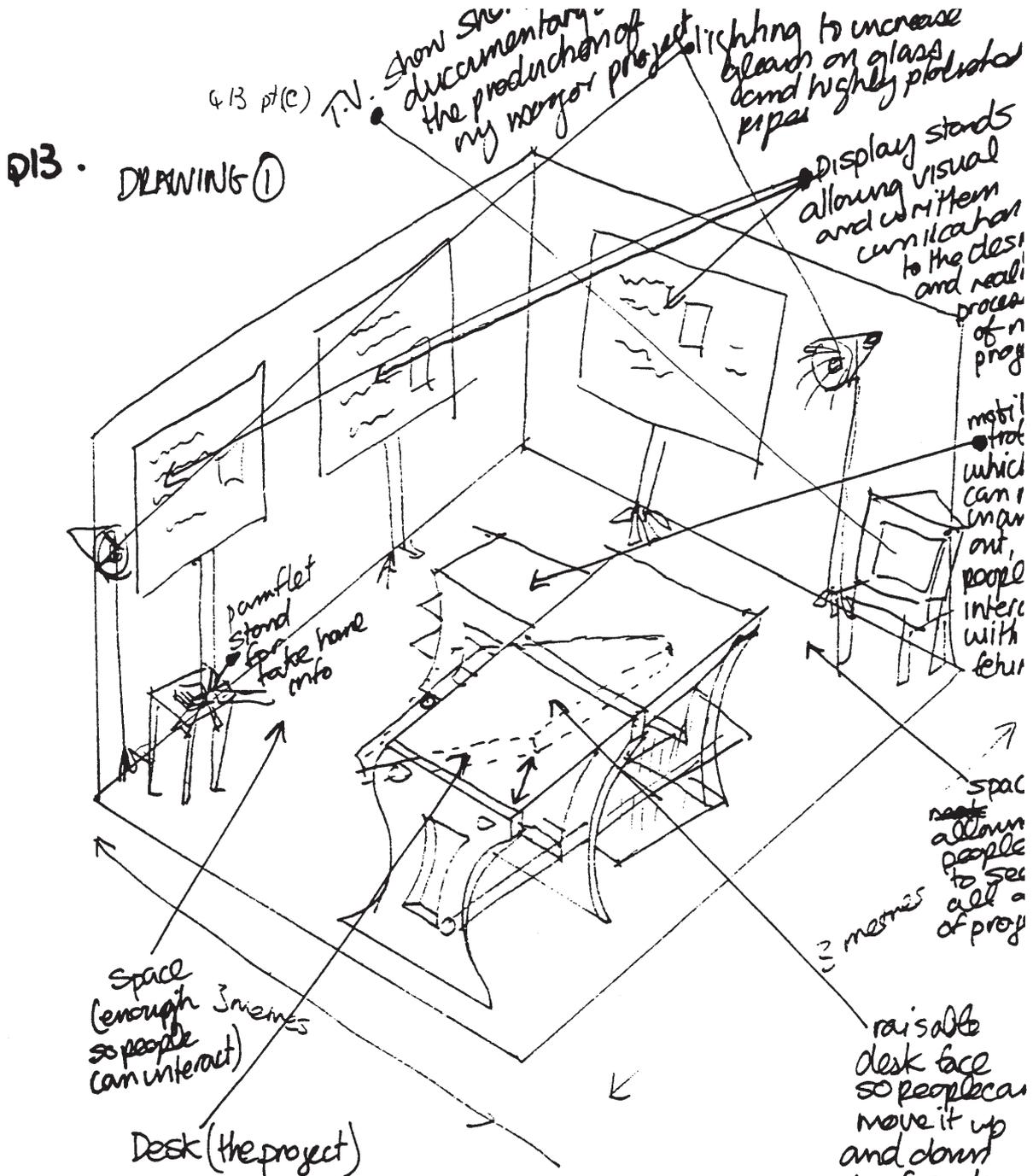
Typical Fair Response

I would use No. 4 because it is a good size for my project and is in a central position in the building.

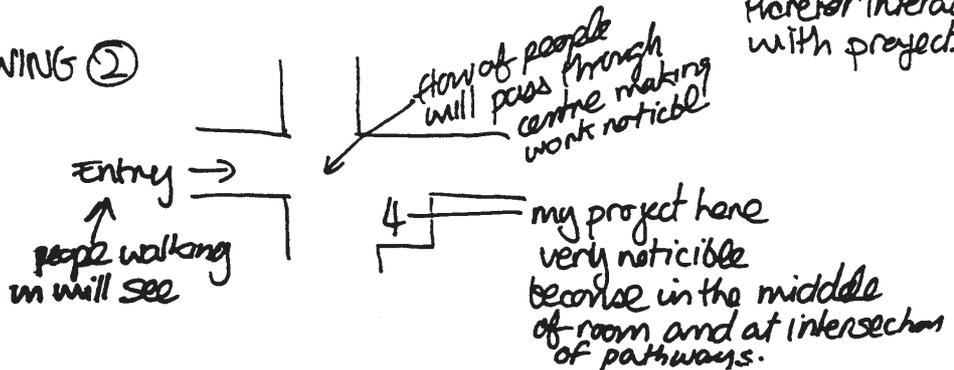
(c) Sketch your design display, taking into account the shape and location of your chosen exhibition space.

Quality of sketches varied greatly. Better candidates utilised both two and three dimensional sketches complete with notations and successfully maintained a scale relative to the space option selected.

Typical Good Response



DRAWING ②



Typical Poor Response

Poor sketches failed to relate their ideas to the shape and location selected. A small number of candidates merely sketched their own MDP.

(d) Indicate on your design how your criteria have been met.

Better answers used some form of legend to relate their listed criteria on their sketch. This enabled clear communication.

Many candidates listed how their design criteria had been met but failed to clearly indicate these criteria on their design sketch.

(e) Suggest how you would determine the success of your display.

Good candidates suggested a variety of quantitative measures to determine the success of their display.

Determining the success of the display would be achieved by monitoring people to see:

- *how interested they are*
- *how long they stayed at the display*
- *how many visit the display*
- *if people learn any new techniques or technology, both in design and production*

This information would be obtained through visitor surveys, questionnaires and simple observation.

After this collection of information and monitoring, a comparison could take place to evaluate and determine the success of the display.

Poor candidates tended to focus on their own impressions rather than using more objective measures.

The success of my display would be best determined by how many people came to look at it . The compliments and praises given to me about my work, the smiles from people and whether I am proud and happy with my design.

(f) Visitors to the exhibition may want information about your project. Suggest what information may be relevant and how you would communicate it.

Generally well answered by all candidates. Most candidates were able to indicate relevant information and were able to state various methods of communication.

Better candidates were able to relate the information being sought to an appropriate means of communication.

Typical Good Response

The information that would be relevant would include:

- *the design process – showing methods of research*
- *design techniques – indicated through sketches*

- *production process – through sketches and samples*
- *production techniques – materials, tools used*
- *finances – how much it cost to make*

This would be communicated through posters, and a short video which documented the processes and techniques that I went through to complete the project. Also small pamphlets outlining the information could be made for visitors to take home and refer to at their convenience.

I would give information on posters and in my folio for people to read, but have more relevant and basic information on pamphlets that people could take home. These pamphlets would be more detailed than the posters but less than the folio with information such as materials, cost, time, availability of materials, tools and optional materials. These pamphlets would also have my phone number on them so people could speak to me regarding any queries they may have.

Poorer candidates failed to link the information to a communication method but simply listed both.

Question 13 (Suggested responses)

You have been asked to display your Major Design Project in an exhibition, field day or trade fair. A floor plan of the exhibition area is shown below. The exhibition space options 1, 2, 3 and 4 are shown below. All other exhibition spaces are occupied.

- (a) Identify and explain the criteria that you should consider when you design your display.

Indicate the MDP.

Criteria	Explanation
Attractiveness	appeal, to attract visitors to come and look
Visibility	seen from entry/exit points, all directions, pathway
Size	relationship of size of MDP and area of display
Safety	concern with safety of visitors viewing display
Cost	budget for cost of the display
Security	protection of MDP from damage/theft
Resources	materials tools, graphics to enhance display
Services	does the MDP require power, water, lighting?
Others	

- (b) Nominate the exhibition space option you have selected.

The space should be appropriate in size, scale, proportion and shape to the display.

- (c) Sketch your design display, taking into account the shape and location of your chosen exhibition space.

A 3-D drawing would show the design and shape of the display. A drawing of a floor plan could

illustrate the location of the display.

(d) Indicate on your design how your criteria have been met.

Indicate on sketch (c) how the criteria in (a) have been met.

(e) Suggest how you would determine the success of your display.

Estimate number of visitors by counting, eg the number of pamphlets taken.

How many visitors asked questions, informal conversation & questioning.

Length of time they stayed to look at the display.

How many orders were placed.

Interest by the media, eg TV, trade magazines, radio.

(f) Visitors to the exhibition may want information about your project. Suggest what information may be relevant and how you would communicate it.

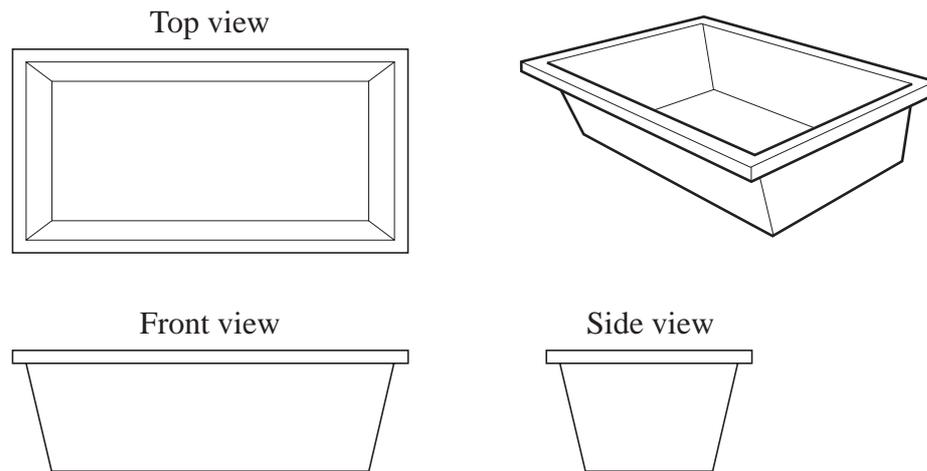
Relevant Information Means of Communication size/s photos, drawings
 design/variations pamphlets, handouts materials, techniques used video cost, delivery
 time talk to visitors construction details information plaque, signs designer/builder, brief
 folio

Question 13 Marking Criteria

(a)	Indication of MDP
	Identify and explain: Safety, Cost, Size, Security, Attractiveness, Resources, Service, Visibility
(b)	Nominate exhibition space
(c)	Sketch Shape and Location
(d)	Criteria from 'A' indicated on sketch
(e)	Number of visitors, how many asked questions,
	orders placed, media interest, pamphlets, or brochures taken.
(f)	Information and communicate sizes, designs available, materials cost, construction, details, photos, phone No., Fax, delivery time.
TOTAL	

Question 14

You are a designer who has been asked by a storage system supplier to design a range of storage products using the plastic box shown below.



(a) Describe THREE different storage situations where one or more boxes could be used.

Responses to this section ranged from:

- single word lists of uses for the boxes to
- a concise description in full sentence form of where and how the boxes could be used.

A typical well considered response

A family living in an apartment with 2 young children. Both children are under 5 and at home all day making mess all over the floor with their supply of toys trucks, dolls, Lego blocks, pieces and puzzles. As they live in an apartment they need a good storage solution.

OR

To store all the bits and pieces that lie around while dad and I are restoring an old car. We need to put the stuff somewhere so we don't lose any.

These responses described the need for a storage solution and identified the situation clearly.

An average response failed to provide a complete description for each of the three storage solutions.

For example:

The storage system could be used in a number of environments. Some of these environments could include:

- (i) *storage of papers and stationary*
- (ii) *storage of video tapes and cassettes*
- (iii) *storage of rubbish and waste*

A below average response was to provide a list of storage solutions rather than a description.

For example:

To store: toys, plants, car parts

- (b) Identify the design criteria for a solution to each of the storage situations described in part (b).

From the first example given in part(a) the following suitable response was given.

Design criteria for a family in an apartment

- *This storage system must use the least amount of space possible yet hold a fair amount of toys.*
- *It must be attractive and appealing to the young children so they can feel it is one of their toys also.*
- *It must be safe for the kids to use*

OR for the second example:

the boxes must slide on drawer type shelves so that you can get to them. It would be good to be able to put labels onto the front of each box so that you know what's in it. Also they must be strong enough to hold the weight of the car parts and the plastic must not be affected by the oil etc.

These responses made it quite clear from the candidate's point of view exactly how they wanted their solutions to function. It was evident that they had considered their response in terms of the question.

An average response was unable to demonstrate a clear understanding of the term 'criteria'.

Responses included descriptions of storage solutions in more depth but lacked clearly identified criteria.

For example, for a storage solution described as a household recycling bin locked in place with a lock that can't be tipped over, the criterion was described as:

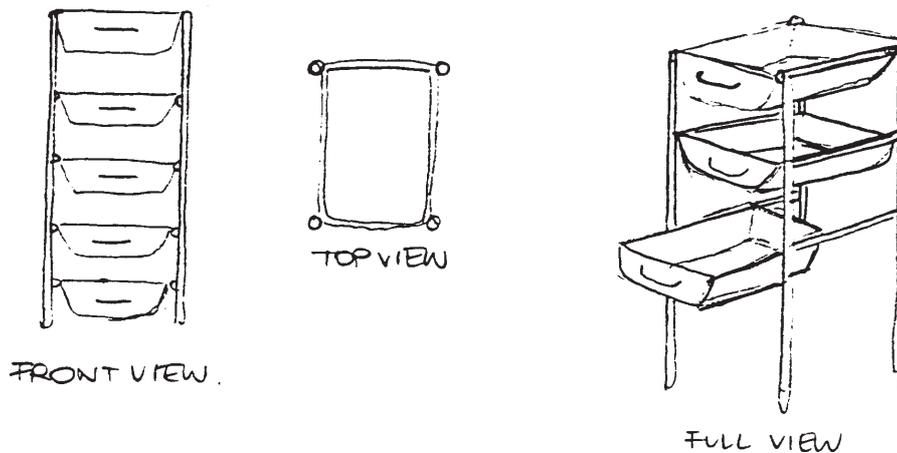
the creation of a catch lock which clamps down over the groove of the bin. One at each end of the longest side. These clamps can be put up anywhere along garden fences or walls by the use of strong suction caps.

(c) Sketch a separate design solution for each storage situation and clearly label the design features.

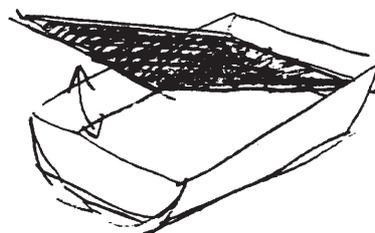
The sketches presented by candidates needed to reflect a solution to each of their situations from parts (a) and (b).

Clear labelling was essential to ensure that the design criteria were treated fully in their solution. Orthographic and/or pictorial sketches were considered to be the better responses.

Some examples are shown below.

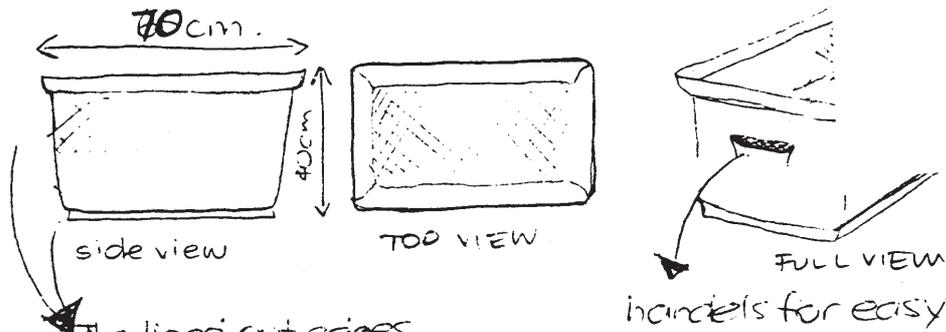


- IT COMES WITH 5 SLIDE IN/OUT DRAWERS.
- MADE FROM STRONG METALS GIVEN A POLISHED FINISH: IT COMES IN SILVER OR METALLIC BLUE.
- ~~EACH~~ DRAWER HAS A HANDLE FOR EASY USE
- EACH DRAWER HAS A DIVIDER AS SHOWN BELOW



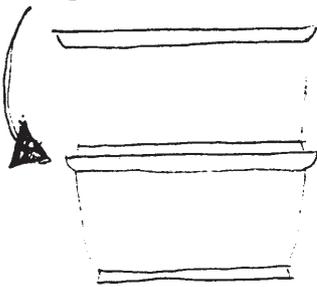
IT'S ON A SPRING
& CAN BE MOVED
UP & DOWN AS SHOWN
* These are optional
for all or some drawers.

C. 1. Young Couple + 2 Children under 5



The lip cut edges at the top make it possible to stack these boxes as high as x4, saving space.

handles for easy moving.



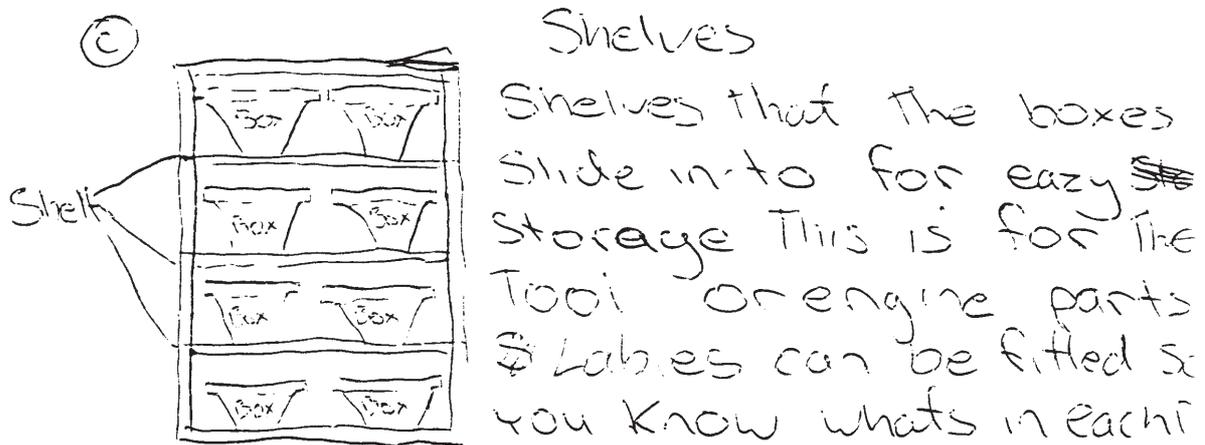
- They come in a range of colours: Blue, Yellow, Red, Green, Purple & Orange. These are all primary colours & very appealing to kids.
- The boxes are quite big making it very easy to store various sizes of toys. 40cm Deep & 70cm wide.
- The boxes can also be used as toys: dolls beds, tea tables (when upside down) and many more great ideas for kids.
- Made from biodegradable plastics these are environmentally friendly & cheap.

(Please note, this sketch does not correspond to any of the responses quoted thus far.)

Each of these examples shows a good solution development and each of the criteria mentioned in their part (b) have been addressed fully.

Average range responses failed to adequately communicate a clear design solution through:

- lack of clarity in sketching
- lack of consistency when sketching three storage solutions
- failure to illustrate how the plastic box would be used in the storage solution
- labeling that failed to explain the intent of the sketch even though it may have identified features.



- (d) Discuss ONE important issue that needs to be addressed in the manufacture of each design solution.

A candidate's response needed to address a manufacturing issue in terms of an appropriate choice of materials, tools or techniques.

OR

If the criteria from (b) was restated then it was necessary for issues relating to the manufacture of the design solution to be discussed. Issues such as: quality control, product testing, recyclability, packaging, sustainability, cost.

If my solution was to be manufactured then it would need to be easy to assemble by someone at home – like IKEA.

To make sure that the boxes were safe for kids you would need to try one every now and then to make sure that there were no sharp edges and that the corners were round. The metal frame should be shiny and not scratched and the wheels on the bottom should roll easily without wobbling.

A number of candidates had difficulty identifying issues that related to the manufacture of their solution.

An average response was able to identify important issues in manufacturing such as environmental sustainability in selection of materials, but was unable to apply this issue to each design solution.

An average response was able to identify issues based on the criteria suggested in part (b), but did not discuss these in terms of manufacturing.

For example:

Make sure that the boxes are strong enough to hold heavy materials and have handles so they can be used as drawers in cupboards.

OR

How much will it cost for the labour involved in the design project?

OR

Will it be cost effective to use environmentally friendly or recyclable materials?

- (e) When designing, functionality and aesthetics are significant issues. Compare how you dealt with functionality and aesthetics in your Major Design Project with how you would deal with these issues in ONE of your storage design solutions.

Good candidates clearly explained the processes and methods used to ensure a quality outcome in their Major Design Project – specifically discussing functionality and aesthetics, then a direct comparison was made as to how they would ensure that their storage design solution satisfied its intended function and that it also looked good.

An above average response highlighted the actual processes used by the candidate to ensure and evaluate functional and aesthetic qualities. In addition they then discussed these values in terms of how they would evaluate the aesthetic and functional aspects of the storage solution.

Average responses were able to describe their Major Design Project but had difficulty identifying functional and aesthetic criteria. Limited comparisons between MDP and the storage solution were presented.

For example:

When I made my MDP I concentrated on the fact that there were no sharp edges or sticking out pieces of metal that could cause harm to humans or to the sheep (sheep crate). By creating hinges and screws out of plastic this would mean they were the same material as the boxes therefore they can put up with the same amount of resilience.

Examiners' Comments

The question yielded a broad range of responses. It was, however, evident that a good many candidates did not clearly understand the demands of the question. There appeared to be some lack of understanding of such terms as 'design criteria', 'design situation', 'functionality' and 'aesthetics'. Sketching and annotation were generally well done with a fairly even spread of drawing techniques used.

Question 14 Marking Criteria

A - Situation
Situations should be different in terms of : <ul style="list-style-type: none">- how and where the plastic box will be used.- must describe storage situation eg store toys in a toy box, store auto parts in the garage.
B - Design Criteria
Design Criteria should be appropriate for each situation: <ul style="list-style-type: none">- strong to hold weight- visual appeal for child attraction- lightweight for ease of use- an important feature for each situation described
C - Drawing and Labelling
Either orthogonal or pictorial views Labelling to include: features, how it works, parts, decoration Consider overall value of thumbnail sketches
D - Manufacturing
One important issue to be addressed in the manufacturing of all three design solutions eg: appropriate choice of materials, tools or techniques OR One manufacturing issue for each storage solution. May re-list criteria from (b) but should attempt to link to manufacturing if manufacturing focus is clearly intended.
E - MDP, Functionality / Aesthetics
Look for comparison between boxes and MDP References should consider Functionality and Aesthetics <ul style="list-style-type: none">- MDP only- Box only- Comparison

3 Unit (Additional)

Section I (12 marks)

Question 1 (Compulsory)

In Australia, current social and economic indicators point to significant changes in the nature of work. Led by technology and innovation and facilitated by workplace reforms, it is likely that people will take on several new jobs during their working life. Complete reskilling on a number of occasions may be required. Many of these jobs have yet to be thought of, designed or implemented. Work may become more integral to life, leisure and lifestyles.

Using examples you have studied, critically analyse the impact of technological change and innovation on the Australian workplace. In your answer, examine the possible positive and negative impacts on individuals, society as a whole and the environment.

The stimulus material on the next page may also be used when answering this question.

WORK ODYSSEY 2001

Welcome to the future of work. Where are the most challenging, the most interesting and the most lucrative jobs going to be found in the future, and which industries are set to boom ahead?



Welcome to the future of work—or at least to one version. While the future is hard to predict, current employment trends give us strong indications of which jobs will and won't be around next century. 'Projections rely heavily on the assumption that the past will be continued in the future,' points out labour market researcher Rodney Stinson. 'I think there's some element of truth in that. However, the real danger is that if one just continues past trends, then one doesn't start to look for turning points.'

IT'S SATURDAY MORNING SOMETIME IN THE 21ST CENTURY

The recruitment sections of the Web 'newspapers' (as they're still quaintly known) blaze up on your laptop computer for a quick browse before your domestic assistant arrives to do the stack of ironing, walk your dog and take your shoes to the shoe repairer. You've been thinking about a career change now for a few weeks. After eight years in the same line, it's time to move on, before people start thinking you're a stick-in-the-mud. Besides, what interested you eight years ago is very different from what interests you now.



And all of this in an environment of radical change. Australia Post's new status in the corporate field has involved huge amounts of change which is Linda Nicholls' bread and butter. Not only is change normal, she says, it's invigorating: 'If I look back in my corporate life, there were many times I was involved in organisations that had to undergo quite dramatic change—whether it was restructuring or downsizing or merger and acquisition, or any of the dramas of corporate life. And what stood out in my mind were managers who were very concerned about the morale of their staff, who were feeling besieged on all sides, who tried to comfort their troops by saying, 'Look, the sooner we get through this, life's going to get back to normal.' Not true! Change is normal. Continuous improvement is normal. It's the way we do things out here. It's not that we do a little burst and then sit down for a rest. No.'

Another way in which the Internet is altering the nature of work is by making the world a smaller place and enabling people in different countries to work, in effect, alongside each other. . . .—sending software back and forth on the Internet, and video-conferencing. 'In the last two years, we have reduced our flying a lot—at least two-thirds, I would say,' according to the company's Joe Latty. 'The year before last we were putting stuff on hard disks and flying it over to America.' Latty foresees an increasing number of companies working internationally like this.

Source: Australia Post

Examiners' Comments

- Students should not waste their time rewriting the question. Read and analyse the question thoroughly then launch into attempting the answer.
- Students who used only one or sometimes two technological examples had difficulty in articulating three positive and three negative impacts under each of the headings individual, society and environment.
- Students who used more than two technological examples were able to write a greater variety of positive and negative aspects – some were able to come up with seven and eight examples and these scored very well.
- Students need to audit their responses to check that all aspects of the question have been addressed.

A good example was:

Current social and economic indicators point to significant changes in the nature of work. The impact of technological change has had both positive and negative impacts on individuals and society as a whole and the environment.

The internet is one of the latest technologies which has led to huge changes regarding the workplace. The positive features around the workplace include:

- *through e-mail, better communication links with other companies and industries*
- *receive information faster, if it is just written information a letter in the post may take a day, where e-mail can take one minute*
- *communication links with overseas*
- *research about things you want to know can be received through internet web sites*
- *is a time saver, you become more productive and get more done throughout your day.*

A workplace as you can see does benefit greatly from this improved technology.

Hands-free phones (speaker phones) are another innovative technology. You benefit from them greatly because you are able to:

- *talk to a person on the phone, while walking around your office trying to find something or researching on your computer*
- *when working with machinery and the phone rings you are able to answer it and continue with the person talking to you*
- *when travelling in a car with mobile phones you are able to answer the phone while still driving*
- *they are convenient when you are under a busy schedule and things need to be done. Hands free phones are designed for your convenience. Also have the technological innovation of having the same benefits when travelling in a car, you can speak to someone almost anytime and not entirely interrupt their work practices.*

Video conferences are also another technological change which workplace can benefit from its use. Ways in which it helps is through:

- *seeing what every person is doing, testing that the people you are speaking to are ready for their business negotiations*
- *way of communications through suburbs, states countries etc*
- *you are unable to go to business firm to see its new technologies, it can be shown at the video conferences*
- *way of seeing people which you haven't seen in a while. It can be groups of people as long as you all fit in the conference room*
- *testing Australia's technologies to see what other improvements can be made to today's current technologies.*

The impact it has on the individuals in a positive way are:

- *less time consuming, get more in your day*
- *more productive*
- *better communication links*
- *convenience*
- *everybody can benefit from the use when working in a workplace.*

Negative Impacts:

- *job loss, technology has taken over*
- *more people have to go through training to be able to use their technologies*
- *if something goes wrong with the technology people know who to blame and it cost money for them to be fixed*
- *people believe that they can perform better than the technology.*

Positive Impacts of technological change on society:

- *technology is more accurate*
- *many people can benefit from these technologies*
- *it is improved resources so the standard of living is improving*
- *people rely on these technologies and become necessary throughout life*
- *more productive*
- *communication increases.*

Negative impacts on society:

- *people become lazy and use technological everything and lose their own personal fitness and health etc*
- *job losses*
- *believing that they were fine the way they were. Technological change isn't necessary.*

Positive impacts on the environment:

- *parts used in technology are recyclable*

- *communities benefit from its advances*
- *people believe that it is a helpful source, and can bring people closer together.*

Negative impacts on the environment:

- *increased pollution*
- *increased wastes*
- *people believing that it affects the working environment for, job loss, reliance on technology (what happens when the technology breaks down)*

Examiner's Comments

The intended essay format was difficult for some of the students. Many students answered the question based on past exam questions which were on the innovative plough, Australian technologies such as Dynamic Lifter, or the stump jump plough etc. If these had been related to the farming community workplace, students were able to obtain some marks. Most only related to 'the workplace'.

The poorer candidate sometimes wrote about the historical perspective of the technology and not current technological changes, also, they did not relate the technology to the Australian workplace and failed to give negative impacts on the Individual, Society and on the environment.

The notion of 'change' as referred to in the stimulus material (supplied) was poorly understood and was not referred to often.

In the following example, the candidate considered only the negative impacts on society.

Technological change is coming, wether we like it or not. People who make things by hand may see themselves out of job in the next few years because they will be taken over by computers soon there will be no need for labourers or bricklayers as robots will do the same job quicker.

As in the company Harmony Doors, the manufacturer of kitchen cupboard doors. They used to be labour intensive. But now everything is done on computer, you can turn out 100 doors in 30 minutes. The only labouring job which comes with this is setting up the jib, router bits and putting the sheets down ready to be cut, size them routered to the set pattern. This \$750,000 set up is the most technically advanced and user friendly system in the world. It would supply 5 to 7 different companies with Kitchen cupboard doors to last a month in 1 and 1/2 weeks. This has its ups and downs as it is quick and reliable, but will put 15 to 20 people out of work so that it can make its money.

Question 1 Marking Criteria

Question 1	Impacts	Critical Analysis of Positive and Negative Impacts
<p>Emphasis should be on the impacts of technological change and innovation in the Australian workplace on individuals, society and the environment and not on innovations.</p>		
Individual	Positive	<p>Flexible hours; job-sharing; work from home - easy to access and share information, can work around family commitments; no long trips - meetings can be conducted by teleconferencing; less work hours; increased part-time work; more leisure time; healthier, longer working lives; negotiate wage and conditions to suit; more variety and choices, plus opportunities for change; disabled may work from home; decentralisation; more opportunities for self employment; training taking place as part of work.</p>
	Negative	<p>More shift work; less social interaction if working from home; decreased privacy in the workplace due to more sophisticated surveillance; loss of individuality, tightly controlled workplace; impact on family time; better informed; reduced personal interaction; increased part-time work; no sick leave, workers' comp., company super; constant retraining.</p>
Society	Positive	<p>Global perspective increases business opportunities; businesses operate longer hours - more access, more leisure time; healthier workforce due to improved medical technology; cashless society; emphasis on service; perhaps more innovation; lower overheads encourage more businesses to start up; merging of cultures leads to understanding and acceptance.</p>
	Negative	<p>Fewer unskilled jobs; presents new ethical dilemmas, eg. biotechnology; increased unemployment; more stress related illnesses; new technologies may phase out traditional methods; reduced cultural diversity; global movement of money reduces available tax for welfare programs; concerns of security over Internet transactions; unethical 'hit and run' businesses; higher standard of living; globalisation may take little account of local or indigenous, cultural pursuits, industry etc.</p>

Environment	Positive	New technologies acknowledge importance of bio-diversity; use of fossil fuels will be replaced - increased use of alternative energy sources; decreased business travel; recognition of importance of sustainable technologies; less paper due to electronic transactions; lower energy usage due to lack of 'shops'.
	Negative	New technologies may have unforeseen long term consequences; bioethics; mobile phone towers; alleged radiation from mobile phones; etc; rampant consumerism and consumption due to lower prices and competition.
Examples	Appropriate, relevant and related to I, S and E	Mobile phones - penetration and cover; Laptop computers - E-mail, less paper, convenient; 'E Commerce' - no need for a shop, can work from home, lower overheads, flexible work hours; Call Centres; Artificial Intelligence; Fuzzy Logic (no set parameter); Internet; Robotics.

Section II (8 marks)

Candidates attempted ONE question from this section. All questions were of equal value.

Question 2

The world appears to be shrinking due to innovation in transport and communications.



Consider the images above and answer the following questions.

- (a) Identify a mode(s) of transport that you are familiar with and discuss innovations that have resulted in improvements.

All candidates were able to identify a mode of transport with only some able to discuss more than one innovation well. The poorer candidate listed innovations but did not discuss how the innovations had resulted in improvements.

A Good Response

Cars have been continually improving their features including; Motors with an innovation being fuel injection, ABS braking systems, car air bag. Fuel injection has allowed for better fuel economy and responsive acceleration. ABS, is a braking feature which is an improvement that ensures the wheels don't skid when used in an emergency. Air Bags are a safety feature which offer the passenger safer travelling which is an improvement and innovation on assisting the seat belt.

A Poor Response

The new XR8 has a much more efficient exhaust and has a more potent motor.

- (b) Discuss the cultural needs and wants that could have influenced the developments identified in part (a).

A generally poorly answered section with most candidates not understanding the nature of culture in terms of needs/wants. The better candidate made an attempt which centred around the needs of people and not necessarily containing a cultural aspect. The poorer candidate tended to rewrite key words from the question with little or no meaning.

An Average Response

Needs and wants for such developments to take place are due to cultural needs. These influence innovation in things such as safety (ABS, Airbags) and fuel injection resulting in improved performance and economy.

A Poor Response

People in many different cultures have needs and wants. People want certain things.

- (c) Explain the technological developments that were necessary for the innovations identified in part (a) to be possible.

The majority of candidates were able to explain only ONE technological development with the better candidate able to explain more than one.

A Good Response

Technological developments in engine designing and fuel systems would have to be improved to allow for such systems as fuel injection. ABS braking systems required developments on existing braking methods. Technological developments in brake engineering had to be made with investigation into the success of the new idea. Air Bags were a feature that added to the safety of driving. Developments on impact sensors had to be made. This enabled the car to respond on impact resulting with the bags to come out.

A Poor Response

Concord had to have new technology to make it go faster, but consume the same amount of petrol.

- (d) Critically analyse the impact of changes in transport on society.

The majority of candidates discussed or listed either the positive or negative impacts of the technology. 'Critically analyse' means students need to consider both positive and negative impacts. The best responses addressed both areas well. General discussion was quite good with candidates able to talk about the issues of technology. Many candidates had difficulty relating the discussion to society.

A Good Response

Changes to transport have resulted in the higher level of pollution in the environment. They use fossil fuels which also contribute harmful gases when used. Changes have led to improved cars with features that were not available previously such as; electric windows, central locking, air conditioners, CD players, power steering. These changes have resulted in making driving more comfortable and easier to operate. Through transport, changes have enabled the importing of products from overseas which has now reduced the time between deliveries due to the high speed at which can now be possible such as planes instead of sea methods like boats.

A Poor Response

Over the past centuries transport has changes a lot. From the old days of just horses and donkeys to the horse and cart and so on. The main one reason why transport has changed so much it due to new technology. Now computers can design a car on a certain program and been connected to a machine and the machine can make it.

Question 2 Marking Criteria

<p>Part A /5</p>	<ul style="list-style-type: none"> - Identify a transport mode - Discuss innovations that resulted in improvement 	<p>A mode of transport could be a bike, skateboard, in-line skates, air, train, etc. etc.</p> <p>Require at least TWO innovations: ie.aero-dynamics, size, alternative fuels, steam, diesel, electric, ball bearings, size, power steering, auto transmission, computer fuel management, central locking, plastics, new fibres, upholstery, air bags, disk brakes, ABS, alloys, kevlar, one button locking, alarm systems (car tracking), mountain bike design to cater for both sexes, wider wheels and tyre design, lightweight frames and components, gearing and methods of changing gears (finger/grip), leaded/unleaded petrol, overhead cams, electronic fuel management systems.</p>
<p>Part B /5</p>	<ul style="list-style-type: none"> - Must relate to (a) - Cultural needs and wants that influenced the development 	<p>Require at least TWO: cheap easy travel on long distances, need to communicate with others, need to stay in touch with family, diesel cleaner than steam, electrification - cheap, clear, quieter, faster than diesel, monorail - noise considerations, change in family size/structure, dual incomes leading to an increase in financial status (independence), prevention of theft of cars, increased safety and comfort of travel. Hierarchy of cost of transport, status in the community, (bike to helicopter) both parents working - two car families, ease of use, trendy ie. RAV4, self esteem, need to be able to go where and when we want, society getting 'faster'.</p>
<p>Part C /5</p>	<ul style="list-style-type: none"> - Must relate to (a) - Technological Developments (at least TWO) 	<p>Require at least TWO technological developments: manufacturing processes and the impact of processing new materials, electric motors - computerised signalling systems to cater for the increase in number of trains, introduction of computer technology/machines that make these innovations viable/affordable.</p>

<p>Part D /5</p>	<ul style="list-style-type: none"> - Critical Analysis - Impact of changes in transport (positive impact and negative impact) - Must relate to society to get full marks 	<p>Positive and negative impacts: transport has resulted in a faster means of transportation available meaning that there is less travelling time between cities and countries. It has 'opened up' the world and made it 'smaller'. The exchange of goods and services between countries has either helped or impeded the economy of countries with high unemployment due to the high importation that occurs. The 'make up' of societies has changed greatly due to the access to travel. Multicultural impacts are many and societies have to accommodate or cater for many cultures living in 'one' region. People in remote areas now have access to a wider range of goods and services and speciality areas like Hospital. Modern transport can carry more, better efficiency.</p> <p>Reliance on transport - if a problem results, big impact on community ie. wharf disputes, faster transport ie. cars has meant more deaths and more people are driving due to easier access to cars (affordability). Possible impact on health ie. we always drive - even very short distances where bikes were used before. Huge increase in petrol consumption and the effects of pollution, impact of noise of air travel, runways are too small - higher congestion, more flights, more noise, flight paths, second runways, decrease in safety, increase in accidents, impact on those under flight paths, high cost to the community (physical, mental health).</p>
<p>TOTAL /20</p>		

Question 3

The development of the personal computer started with hobbyists designing their own systems and selling them to friends and other hobbyists. This entrepreneurial activity was further expanded by offering special deals to schools, and selling the computers in kit form to keep the price down.

You are the designer of a new personal computer that is faster, cheaper and more compact than any other available.

- (a) Propose how you would introduce this product to the market, identifying the key aspects that should be addressed.

A Good Response

A product such as a personal computer is already in a crowded marketplace where the product is in maturity stage, however this product is not like the majority of PCs it is faster, cheaper and more compact therefore these are the main selling points (or its competitive advantage).

- 1. Cost: How much cheaper is it than the competitors? Will it be profitable enough to keep the business in business?*
- 2. Quality: It is fine to say that a product is faster, cheaper and more compact, but in reality consumers want to know how good the quality of the product is knowing that there money has been put to good use so this is an area that needs to be stressed to the market.*
- 3. Distribution: Where the consumer will find this new computer – at a department store or a speciality computer store.*
- 4. Reputation. The reputation and image this computer wishes to hold eg. 1. Up market trendy computer or 2. Economical, cheap, good for the price computer as this will influence what market it will be targeted at.*

Before this can be introduced to the market, the actual market must be established (target market). This may be done demographically, geographically or psychologically.

- (b) Your competitors are eager to copy your product because it is so good. What steps could you take to stay ahead of your competitors?

A Good Response

There are two types of patents 1. Petty – short shelf life (up to 6 years) 2. Standard – up to 20 years. As technology is rapidly changing and there are always improvements in the computer field, it would probably be beneficial to take out a petty patent as after 6 years this product which is so new now will be obsolete.

This candidate then discussed the method for applying for a patent, which type would be more suited to this product and how the enforcement of this document could be carried out.

A Poor Response

Secrecy is one step. Another is copyright or just making your original product better than their imitation.

- (c) You have the opportunity to hire the chief designer from your main competitor. Discuss the ethical issues that may be involved if you do employ this designer.

A Good Response

The designer may be willing to work for my company purely to gain company secrets for my competitors. This is ethically wrong as it makes a distrustful marketplace. If the designer brings unfinished work from his previous workplace, ethics asks who owns the design. The person who designed it or the person/company who was paying them to this brings about other ethical decisions was working on designs at home . When does the designers work start and stop? This matter may then go to court for a legal decision as to who owns the design.

A Poor Response

On his part he would have to be secretive and trustworthy. i.e. not the type of person to leave and then go and join one of your competitors chief designers team.

- (d) After your computer has been released to the marketplace you discover that there is a fault in the design which may cause minor injuries to a small number of users. It is estimated that the cost of recall, redesign and repair is much more than expected total compensation claims. Discuss the issues involved in deciding what action should be taken.

A Good Response

Paying for a recall would probably be more than compensation for victims, although a company can not be sure on this. The company must consider ethical practice, and bad publicity if they do not react once they know this danger. Legal implications are also as important as those ethical ones. Business practise involves making varied ethical business decisions involving product impact, competitor impact and general operations. Businesses need to have good business ethics to be successful and conform to the best practise.

A Poor Response

The issues are ethics. Is it right to allow people to be hurt instead of recalling all your products? Is it fair that someone who trusted your products by buying it have that trust broken by being hurt.

Question 3 Marking Criteria

(a)	Propose introduction to market	Identify target market, advertise, sponsorship
	Identify key aspects	4Ps, product, price, promotion, placement
(b)	Steps to stay ahead of competitors	Patents, copyright, trademarks - on components or manufacturing processes, encrypted chip technology Ongoing research and development Legal action against pirate copies Keep up with market trends
(c)	Ethical issues of employing chief designer	Protection of intellectual property - previous employer Adoption of style of new designer to your company Loyalty of designer to new and old employer Company reputation in employing competitor
(d)	Issues in deciding action on possible recall	Financial impact Damage to company reputation Employee satisfaction Long term company image Effect on future sales Obligation to provide safe product
TOTAL /20		

Question 4

Sport and leisure are areas in which design and technology have been a driving force. Better equipment, analysis of technique and management of human physiology all have implications for performance and enjoyment.

Some of the candidates answered this question by selecting an innovation that clearly did not suit the sport/leisure theme. However, many candidates were able to demonstrate their breadth of knowledge and ability to apply it to the specific nature of the question.

- (a) Describe one significant innovation in sport or leisure and discuss the factors that influenced its success.

Good candidates were able to describe the innovation and then outline a number of factors that contributed to its success such as:

- performance eg strength of the ‘Suprarax’ roof racks.
- testing eg tennis line caller trialled at the US Open.
- entrepreneurial activity eg Bill Gates introducing MS DOS into the marketplace.

Good candidates showed a thorough understanding of the innovation. The example used MUST relate to sport or leisure clearly, and not be merely a vague connection.

A Good Response

The ‘cool coat’ was a device designed for use of Australian athletes at the 1996 Atlanta Olympic Games. It was a vest that had pockets that could fit ice packs into them to cool the wearer down. The ‘cool coat’ was successful because;

- *It filled a need – the Atlanta Games was held during a heat wave so the coat was in demand.*
- *It was a quality product and as such people used it.*
- *It was successful protected by patents and it was well marketed.*

Many candidates described the innovations very clearly but could not discuss the factors which influenced their success. Further, candidates needed to discuss more than one factor. Some candidates took examples, which they had studied in class, and tried to ‘force’ their innovation to fit the question. This restricted their ability to answer the question fully.

For example: Dynamic Lifter – with no relation to any leisure activity, eg gardening.

The majority of candidates dealt with a product/equipment as their example with only a small number mentioning the likes of performance enhancing drugs and the study of bio-mechanics which were outlined in the question preamble. This section was generally the section which was best answered.

- (b) What role did government and/or private organisations play in the development, implementation and acceptance of this innovation?

Good candidates addressed each of the three areas outlined in the question and could give specific examples of the role of government and/or private organisations i.e.

- funding for the development of the surfing helmet by the Cancer Council.
- promotion by professional surfers to increase the acceptance of the three fin thruster surfboard.
- support by a sporting association eg AIS.

Poor candidates often mentioned irrelevant information, which had no direct relation to their innovation.

A Poor Response

Through the help of private organisation the development of prototypes was easily accessed and production was also made easy. Also this is still the biggest development for a skateboard.

Candidates must ensure that they respond to each component of the question: many candidates only addressed one or two components, rather than all three - developments, implementation and acceptance.

Many candidates did not relate their response to the question at all in both parts (b) and (c).

A Good Response

The government gave a grant to the designer on the basis of a prototype. The AIS then works in conjunction with the designer to change the design and test it using the AIS athletes. The Australian Olympic team then purchased the vests for the use on the Australian Athletes at Atlanta and also promoted the coat on science shows such as Quantum.

- (c) Analyse the ethical issues of the innovation that impact on the individual, society and the environment.

For candidates to fully respond to this part of the question, it was essential that they addressed each of the three specific areas - individual, society and the environment. Candidates often discussed one or two of the issues while ignoring the third.

Good candidates could relate ethical issues to all three areas.

Many candidates were weak in their understanding of ethical issues and how they relate to the innovation in question. The question asked for candidates to analyse the ethical issues. Many chose to list issues at random rather than analyse in relation to either the individual, society and the environment.

- (d) Suggest and explain how the innovation identified in part (a) could be adapted for another purpose.

This section was generally answered quite well. Most candidates were able to suggest creative adaptations of their innovation i.e. 'Cool coats' for athletes being converted to 'warm coats' for

emergency teams in the treatment of hypothermia. The suggestions were quite good, however the explanation could have been more detailed.

Good candidates went into a detailed explanation giving clear information about the adaptation for another purpose.

Question 4 Marking Criteria

(a)	<p>One significant innovation:</p> <ul style="list-style-type: none"> - sport / leisure - factors that influenced its success - describe and discuss 	<p>Innovation must be significant and be directly related to sport and leisure. Factors for consideration could include: good design, R&D, price, performance, promotion / use by professional, publicity. Examples include: RaceCam, WS Cricket, Headgear, TAB, Drugs/Blockers, high-tech materials eg. kevlar etc.</p>
(b)	<p>What role did government and/or private organisation play in:</p> <ul style="list-style-type: none"> - development - implementation - acceptance 	<p>Examples include: Govt. - legislation, grants, standards, taxes, tariffs, ASA accreditation.</p> <p>Private - sponsorship, awards, assistance.</p>
(c)	<p>Analyse the ethical issues of the innovation that impact on the:</p> <ul style="list-style-type: none"> - individual - society - environment 	<p>Examples include: intellectual property, freedom of choice, sportsmanship, competition, drugs in sport, cheating, safety, technology / money, health, impact on 'fairness', ethics in manufacture - exploitation of underdeveloped countries, impact on environment.</p>
(d)	<p>How the innovation in part (a) could be adapted for another purpose:</p> <ul style="list-style-type: none"> - suggest - explain 	<p>Examples include: Headgear - uses in a multitude of sports. High-tech materials - Kevlar and Carbon Fibre uses in tennis racquets, golf clubs, car bodies, sailing boats, headgear.</p>
<p>TOTAL /20</p>		

Specialised Study (30 marks)

The Specialised Study includes both the research and development of a concept related to the 2/3 Unit (Common) Major Design Project (MDP) and the documentation of all the steps involved in this process.

It should be impressed upon candidates that the 3 Unit Specialised Study is not a simple rework of the 2 Unit MDP, but must be developed from the MDP as a research and development project, resulting in one of the following options:

- an innovative application that refers to the adaptation of an aspect of the MDP (Option 1)
- a new or improved resource that refers to either the improvement of a current resource used in the MDP or the creation of a new resource which better meets the needs of the MDP (Option 2)
- a manufacturing system that refers to the development of an effective and efficient procedure for the further production of the MDP (Option 3)
- a marketing strategy that includes the development of a strategy for the pricing, distribution and promotion of the MDP (Option 4)

Overall, the Specialised Study showed great improvement from the previous year with a greater proportion of candidates more accurately addressing the subject criteria. Candidates more closely targeted the assessment criteria, as indicated in the KLA Handbook, and clearly had a better understanding of terminology used.

It must be stressed that the length of the Study is an issue. Fewer than 10% of Specialised Studies were excessive in length. However some were as long as 5000 words. Concise studies more accurately met the criteria and teachers are advised to support candidates in maintaining the body of the study at 1500 to 2000 words. Reference to an appendix to validate the data is sufficient within the body. Many candidates unnecessarily reproduced syllabus definitions of the different options within the study, clearly reducing the number of words that they could allocate to the actual study within the 1500 to 2000 word range.

Appendices and extracts of 2 Unit Major Design Projects also need to be concise and clearly address the criteria. Samples of questionnaires, surveys etc are enough to indicate where the data in the study is sourced. Extracts need to reflect the nature and intent of the 2 Unit MDP. The full reproduction of the MDP folio within the Specialised Study or as an appendix should be discouraged by teachers. Photographs and photocopies are appropriate.

Option 4 - Marketing Strategy was by far the most popular choice of candidates and these studies were handled well. Candidates who selected Option 1 - Innovative Application often simply reworked their 2 Unit project and need to be more aware of the requirements of that option. Option 2 - New or Improved Resources and Option 3 - Manufacturing System were reasonably well done.

Many candidates adopted a 'business study' approach rather than focusing on the design and technology aspects of their study. Candidates need to revisit their evaluation criteria frequently throughout the study so that they do not lose focus of the aims that they have set themselves. Many students submitted work in large A3 folios. Though this is not a concern during marking, the transport of these large portfolios does prove difficult during the double marking and clerical procedures.

It became evident during the marking operation that many candidates could meet the requirements of including an extract of the 2 Unit MDP by simply photocopying the project proposal and the final solution of the MDP. Markers found that the information contained within these two copies was more than adequate to validate that the 3 Unit Specialised Study was a development of the 2 Unit MDP.

Candidates who omitted extracts of the MDP and did not establish the relationship between the MDP and the Specialised Study were not awarded marks for the Project Proposal. Those who omitted extracts but did show a relationship were awarded a maximum of 4 marks for the Project Proposal. An example of an appropriate extract is shown below.

Extracts from MDP

Situation

Being disabled is a problem that, for many people, has to be overcome in order to survive from one day to the next. In coping with the day to day hurdles that disabled people, such as my grandfather, are confronted with is the need to transport their equipment, such as wheelchairs around with them. When travelling by vehicle, the problem arises in loading and unloading of wheelchairs etc. in and out of the car. Therefore a suitable device that is easy to operate would be ideal in helping the carers of disabled people cope with day to day life.

Brief

I am to construct a device which can easily and efficiently lift a wheelchair in and out of a vehicle in order to make life just a little bit easier for the disabled and elderly of today's community.

Photocopies, photographs or reprints are all appropriate ways of showing the extract from the 2 Unit work.

Specialised Study Checklist

Proposal /5	
No extract means a maximum of 4 marks for this section	Something from 2 Unit MDP, eg. text, photos, copies etc. If there is no extract then maximum 4 marks are awarded.
Relationship between MDP and the Special Study	A statement about the relationship should be evident.
Justification of the Study	Why are they doing it?
Aims of the study	What do they want to achieve?
Criteria to Evaluate Success.	On what factors will they assess the success of the specialised study, as it relates to the Innovative Application, New and Improved Resource, Manufacturing System, Marketing Strategy?
Methodology /15	
Use a range of methodologies.	Have they mentioned methods? Have they used a range of methodologies? Have they provided supportive evidence?
The Critical analysis of collected data.	Has data been collected? Analysed, in terms of positive, negative, etc.? Is the data source recognised?
Generation, testing and modification of ideas.	Are ideas present? Are they developed from data collected? Is there testing and modification of their approach / methodology?
Description and Justification of Resources used.	Are resources for the study mentioned? Described? Justified?
Description and Justification of Processes undertaken.	Are processes for the study mentioned? Described? Justified?

End Result /10	
Synthesis of ideas leading to the study	
Critical analysis of:	Is an end result evident? Has it been synthesised into a logical flow of ideas from the data?
- effectiveness of the study	Was the study effective? Did they say why?
- viability of the proposed development	Has the student evaluated the viability? Has it reflected aims?
- potential impact on society and the	Is a discussion evident about how the IR, NIR, MS or MS may impact on the environment and/or society.
- associated ethical considerations	Some consideration of ethics should be present
TOTAL /30	

Proposal

A Good Response

A very concise and well-worded proposal, not wasting words on the other three options.

Proposal

Century Clothing Company proposes to study an innovative application on the 2-unit design proposal assumption that personality influences costume design.

This option of an innovative application was chosen due to the versatile nature of costuming, one that allows for adaptations, creating appropriate illusions from other costume accessories to produce the impression for the desired period.

Clear concise aims, pointed to aid impact

Aims

*Century Clothing Company hopes to provide small theatre companies with: -
A systematic method of providing inexpensive but highly satisfactory costumes.
Information to create such costumes from limited resources.*

On line suggestions that allow the costume designer to experiment and use their imagination or by using the Internet and to act as a consultant when asked.

A Poor Response

Many words do not necessarily make a good justification.

Justification for the Study

A marketing strategy was the relevant selection for my specialised study because I have a genuine interest in marketing and marketing concepts. Although I do not intend to study marketing at a higher level, I believe the experience to be invaluable, assisting my people, and individual research skills. I also choose to extend my 2 unit Major Design Project because I believe the design has the potential with the correct marketing.

Be careful that the criteria relate to the success of the study and not the success of the venture. Keep them real and assessable.

Criteria established to evaluate the success of my marketing plan

My marketing plan must do all of the following:

- *Bring in profit.*
- *Promote good will.*
- *Make sure that my product satisfies consumer demand.*
- *Provide high standard of quality, service and value to customers*
- *Maintain a highly skilled and motivated work force by providing a stimulating work environment and opportunities for career development.*
- *Be innovative and consistent in striving for an superior performance.*

Concerns

- There seems to be a poor standard of literacy
- Aims and Criteria to evaluate are generally weak and on a surface level.
- Some seem to be duplicating their 2-unit work. Is this double dipping?

General Comments

- Bullet points and white space help in readability and clarity.
- Large font beneficial

- No need to go overboard with glossy presentations - it is the words that earn the marks.
- The criteria to evaluate success is the success of the study, not whether it will be a profitable and successful marketing venture.
- Remember a negative result: eg. 'there is no market for my Olympic logo thongs', may still be a successful study.
- Remember that the 3 Unit study is a continuation of the 2 Unit not an extra MDP.
- Contents page is beneficial

Methodology

The better candidates mentioned several appropriate methods, and most importantly provided supportive evidence of their research methods.

The better candidates used a table format to list the aims of their study and related these to the research methods and then linked and justified their methods of research, ensuring that they stayed within the word limit.

Aims of Study	Research Methods	Justification of Method
<p>Establish the climatic and zone weather conditions for the local area</p>	<p>Search the Internet for climatic and weather conditions Visit local councils for information on records on climatic conditions</p>	<p>The Internet will provide a lot of easy to access information. Local councils will be able to get information on the climatic conditions for this specific area if they have permission to give records out to the public</p>
<p>Establish the type of grasses which are used in different areas on the golf course</p>	<p>Write away to the golf courses in the Mid North Coast area asking for information on what type of grasses are established on their golf courses (see letter in Appendix)</p>	<p>I have chosen to use letters to send to the surrounding golf courses because I can gain information quickly, inexpensively and efficiently from distant sources which could be hard to contact any other way.</p>
	<p>Primary research to establish existing grasses in use in surrounding areas</p>	<p>Identify the pros, cons and uses of each grass which has been identified from Aim 1.</p>
	<p>Literature survey using magazines, books and encyclopedias. Sources from school library, town library, Internet, CD-ROMs eg. ABS, CSIRO</p>	<p>Use of the library and books or magazines that contain information on grasses because it is easy and basic information to obtain. Internet also has lots of information from all around the world and from many companies and organisations which is current and specific.</p>

	<p>Interview local greenkeepers on their opinions of the grasses used at their course and what features in a grass would make it better suited to the surrounding area (via letters)</p>	<p>I also decided to ask local greenkeepers on their opinion of the existing grasses in use, because it is first hand knowledge and information which can be related specifically to my study</p>
	<p>Establish newly developed types or mixes of grasses.</p>	<p>Identify the pros, cons and uses of each grass which has been identified from Aim 4.</p>
	<p>Search the Internet for Turf and Grass producers.</p> <p>E-mail to some Turf companies and organisations.</p> <p>Send letters to surrounding golf clubs for details on preferences to any new grasses they would use.</p>	<p>I decided to use both primary and secondary research sources because it gives me a broader range of grass developments and availability around the area and the world. Both these methods are efficient, quick and inexpensive way of researching and I can acquire information that I specifically need.</p>
	<p>Summarise information from Aim 4.</p>	<p>The summary of the information obtained in A will provide good base of facts on the grasses.</p>
	<p>Interview local greenkeepers on their opinions on what grass would be best for the surrounding area from the information already gained from prior research</p>	<p>Interviews draw on the experiences of experts and allow for specific questions to be answered.</p>

Better candidates annotated/categorised and cross referenced their appendices to make it easier to understand the study in conjunction with the research.

Many candidates failed to critically analyse the collected data in a positive and negative format. This resulted in students being too positive about how good their study was and resulted in them having unrealistic marketing plans. Several candidates made assumptions and stated facts re consumer trends, economics and other information etc but provided no evidence. This reduced the candidate's credibility and therefore failed to attract marks. Very few candidates modified their research tools – but were somehow always able to come up with supportive results for their MDP and their Specialised Study.

A large number of candidates did not produce evidence of 'in-depth' research that is expected of a 3 Unit candidate. A number of students developed advertising campaigns rather than a marketing strategy.

Students should not supply Specialised Studies in plastic envelopes, clear books etc as they are extremely difficult to read under the lighting systems in marking centres.

Not enough thought is put into surveys. Information required for a legitimate end result was not asked for in the surveys.

A poorer candidate used yellow pages, catalogues then added 'no need to survey people because a demand already exists'.

Very little information was gained from the above sources.

Another better response linked and justified the methodology used in the study.

Looking at past and present marketing methods, enables me to find a way of promoting the innovation.

Name of Data Source	Style	Relevancy
Wesh Farms Virtual Milk Man	Internet	Informative yet entertaining
Web site of how to get your milk delivered. An order form which is a way of promotion and distribution. The Milk Stops Here: home delivery is the ultimate convenience	Internet	Informative Narrative Tells people why they should get their milk delivered therefore a different way of promotion
Household Division	Internet	Informative Web Site. Advertises the benefits of milk deliveries on an accessible site
Milk Carton Advertisement	Milk Carton Advertisement	Provides a way of promoting milk
Devondale Dairy Commercial	Magazine Advertisement in Print	Media Picture of Milk Carrier on door-step which shows a way of print promotion where in magazine or as a poster

End Result

Marked out of 10, yet the most poorly completed section of the Specialised Study by candidates. Many write it almost as an after thought, yet it should be the culmination of all of their efforts.

Synthesis of ideas

A good candidate was able to relate the original/initial idea of the MDP to the chosen option in the Specialised Study and support his/her findings with evidence from collected data.

Response: *Through my own market research, and other research (obtained through the two magazines) it has been found that there is a target market for the Danetti R & R. Research shows that more than two thirds of riders don't own a repair stand and that the most common method of bike transportation is in the car – therefore a product such as mine would suit all of these people.*

Comment: In analysing the effectiveness of the study, candidates were required to comment on this possibility but also justify their decisions.

Response: *Through the research conducted, both quantitative and qualitative, the aims, set out in the proposal have fairly successfully been met. Through factual library research, various marketing strategies and media formats have been detailed and evaluated with regard to their possible application to a product such as mine. And the questionnaire and survey results have made it possible to define and locate a target market for the Danetti R & R. Through these results, a plan has been developed that will hopefully successfully launch the Danetti R & R into the highly competitive cycling industry. Through saturation advertising the two popular magazines, the instalment of 'demo' stand at exhibitions and in well regarded bike shops – the intended launch should be a success – and hopefully Danetti will become a household name with riders.*

Comment: With respect to the viability of the proposed project development it was important to evaluate the processes and relate them to the aims of the study.

Response: *Of course a more detailed plan would have to be established if the Danetti was realistically going to be launched into the Australian markets. However, the basis on which my study has been conducted provides solid ground for future additions and modifications to be made. The study has proved that there is a market and it is inevitable that there always will be a market for the R & R due to the fact that people will always be riding and there is a need for transportation and repairs.*

Comment: The specialised study would need to discuss the wider picture and relate to a discussion on the impact on the environment and/or society. Further, there must be consideration given to ethics.

Response: *Making it easier for people to ride will have effect of society as a whole as it has been proven that fitter and healthier people enjoy a more relaxed and happier lifestyle. If more and more people are getting fitter – then society on a whole will benefit from the R & R. The main ethical consideration is that Danetti lives up to the names which it belongs to and that it delivers 100% what we pledge it can do. If for instance it is said that the R & R can fit all roof racks, and in reality it can only fit a few particular brands, this is an unethical approach and would have to be looked at. This could also be furthered into guarantees.*

Comment: For an average candidate it was common to find an end result but more difficult for them to indicate how this evolved from the collected data. In concluding their study candidates focused their attention on either the environment or society, but were fairly general in their comments.

Response: *The boat may have impact towards the society but since boats are already a common feature in today's society it will have less impact than desired.*

The solar panels will create no harm to the environment but the engine might a little. It will only cause the same amount of pollution if not less than other boats.

Comment: In relation to the effectiveness and viability of the study it was difficult for poorer candidates to reflect their aims except in a very simple format. The consideration of impact or ethics was brief but not clearly thought out.

Response: *This process not only met one of the aims stated in the proposal but also it contributes to the success of the marketing strategy. I think the process used in this area is not that effective for it was not that accurate. For the price was only determined through people's comments and opinions not by a professional who specialised in that area.*

Potential impact on society and the environment of the proposed development – The marketing strategy may impact the society through the products price. The price has to be affordable for the market for the society. In the area of promotion the message should be sent to the market in a right way. Also the products materials will play a big impact on society, for the wedding dress raw material is a man – made fibre not a fabric from a natural resource.

General Comments

Candidates need to place more emphasis on the end result section of the specialised study. They also need to be sure to extract the most relevant information to include in the study and support this information with the raw data included, in sample form, in the appendix. Teachers will do well to support candidates in the final edit of the study to reduce excess text which will not contribute to the marking criteria.

Teachers are also well advised to be sure that candidates carry out their work independently or recognise external input into their work by citing sources more clearly. Group projects are not appropriate for either The 2 Unit Major Design Project or the 3 Unit Specialised Study. Candidates and teachers must ensure that submissions are clearly the work of the candidate and where other resources are used they are clearly cited and receive due recognition.

3 Unit Specialised Study

Sample Answer Book

Relationship Between MDP and Specialised Study

In my 2U MDP I made a soy ice cream. My project recognises a market interest in soy products. However, there is a customer concern with the strong flavour of soy products. I have improved this flavour to make my product more appealing to the consumers. It is vital to the success of my product to promote its palatability and to increase the consumer awareness of the benefits of soy products. Therefore electing to develop a marketing strategy for my 2U MDP was an ideal choice.

Justification for the Study

I have elected to develop a marketing strategy to increase the efficiency and effectiveness of my product reaching the target market. It will also help to educate consumers in the health benefits of soy. After interviewing the Production Manager of Simply Divine ice cream I was encouraged by her words, 'There are no good soy ice creams on the market' and 'soy has become more popular and is commonly used as an alternative to milk.'

As I will make my ice cream using standard methods, developing a manufacturing system is not necessary. Initially my product will be made on a small scale and quantity is not crucial to its success.

The options 'New or Improved Resource' and 'Innovative Application' were not suitable for my project because it is a food product and the resources for my product are predetermined.

Aims

At the completion of my study I will have investigated:

- *Identifying if a market exists and who they are.*
- *The best locations for my product.*
- *An appropriate price range.*
- *Methods to promote my product.*
- *Patenting/Trade Mark labelling my product.*
- *The classification established by the food standards code in relation to my product so as to market my product effectively and correctly.*

Criteria to Evaluate Success

A successful marketing strategy must have:

- *Established the target market.*
- *Presented the product in an appropriate location, so the market can obtain the product easily.*
- *Estimated the maximum production cost allowing for profit.*
- *Determine prices acceptable to the market.*
- *Decided through investigation ways to promote my product.*
- *Investigated patenting and Trade Marking. Also to have determined if they were applicable to my product.*
- *Investigated the rules and regulations set by the Food Standards Code and discovered the rules and regulations necessary to my product.*

Rationale for Research Methodologies Selected

<i>Type of Research</i>	<i>Techniques</i>	<i>Rationale</i>
<i>Descriptive Research</i>	<i>Survey</i>	<i>Survey enables me to determine the target market. It will also allow me to identify a price range and outlet location for my product.</i>
<i>Descriptive Research</i>	<i>Interview</i>	<i>Interviewing Simply Divine ice cream business, will introduce strategies for promoting my product.</i>
<i>Operational Research</i>	<i>Observation</i>	<i>Observing the range of ice creams sold in different shops will determine the appropriate outlet locations and a price for my product.</i>
<i>Experimental Research</i>	<i>Taste Testing</i>	<i>This will determine market acceptability of my product. It is vital to establish that my product is marketable.</i>
<i>Descriptive Research</i>	<i>Letters and Phone</i>	<i>This method will allow me to gain information on the rules and regulations of selling a food product. My product must comply with the food standards code before it can be marketed.</i>
<i>Descriptive Research</i>	<i>Fax</i>	<i>This method will provide me with information on registering my product and patenting involved.</i>

Survey

(See Appendix 1 for the Surveys)

1. Results

- 2 of the participants were male
- 13 of the participants were female

Areas currently living in:

Collaroy = 2

Belrose = 2

Davidson = 4

Forestville = 3

Chatswood = 1

Ingleside = 1

Frenchs Forest = 1

Occupations:

Teacher = 6

Accountant = 1

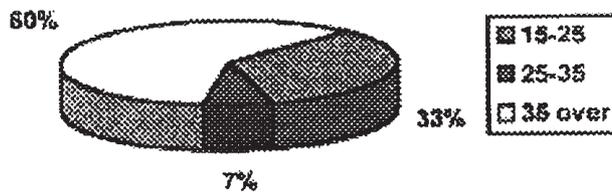
Engineer = 1

Store Manager = 1

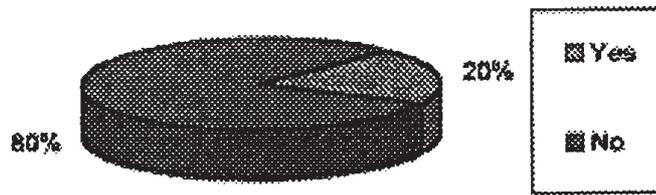
Cashier = 1

Student = 5

2. Which age category do you belong to?



3. *Do you consume soy products?*



If Yes why?

Health Reasons = 1

Lactose intolerance = 0

Other = Japanese diet

to add variety

likes soy products.

If No why?

Taste = 2

Would rather eat dairy ice cream = 2

Other = no need

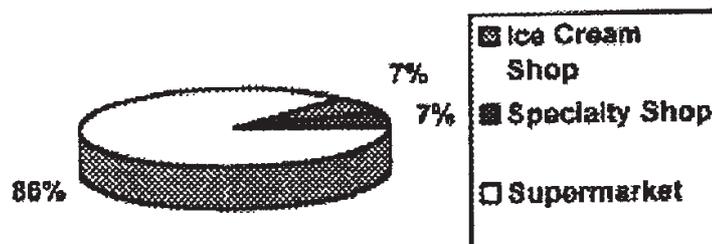
never desired to

never felt the need

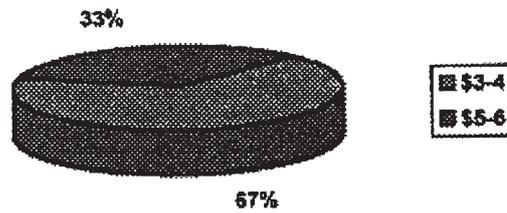
fat content

never been subjected to it.

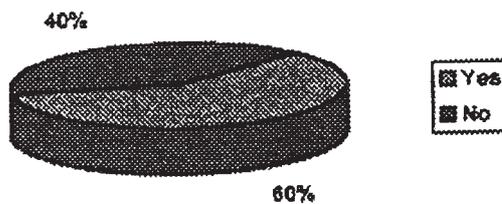
4. *What type of retail outlet is most convenient for you to shop at?*



5. *In which price range would you be willing to buy a tub of ice cream for?*



6. *Does the type of packaging and labelling persuade the decision of the product which you buy?*



Why?

Most participants found that the following features helped persuade them to purchase the product:

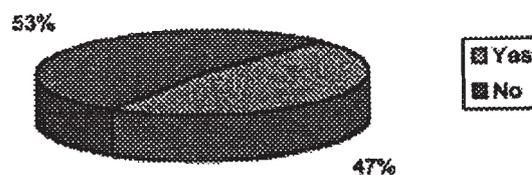
Nutritional chart

Attractive label showing the product

Appealing name and or logo

One participant bought house brand ice cream products only for her children.

7. *If a soy ice cream product were made available would you buy it?*



Conclusion:

Most participants are unaware of the soy products available. Participants consumed soy products for health or cultural reasons. \$4.00 is the maximum price consumers will pay.

Some participants were not willing to try a soy ice cream but a majority were.

Recommendations

I have identified another market segment, the Japanese community. I was influenced by a participant who stated she consumed soy products because of her Japanese background. Consumers of soy products for health benefits would be another market segment to target.

The supermarket is an ideal location for me to reach the target market.

I will price my product no higher than \$4.00.

Description and Justification of Resources and Processes

<i>Resource/Process</i>	<i>Description</i>	<i>Justification</i>
<i>Survey</i>	<i>A questionnaire using various techniques of answering was distributed to the public and the lactose intolerant.</i>	<i>I was able to identify other segments of my target market. I also discovered a price range and location for my product.</i>
<i>Interview</i>	<i>An interview with the Manager of Simply Divine Ice Cream business.</i>	<i>I was able to supply suggestions on marketing strategies for promoting my product.</i>
<i>Observing</i>	<i>An observation of health food shops which sell ice cream.</i>	<i>I was able to determine exactly where I would distribute my product and help approximate a price for my product.</i>
<i>Taste Testing</i>	<i>An experiment where I allowed the market to taste my product and gain their opinion.</i>	<i>I was reassured that my product is marketable and also reassured my product was accepted by the target market.</i>
<i>Phone</i>	<i>Phoning Griffith and Hack patenting department inquiring about what was required in registering a Trade Mark and to discover if my product is patentable.</i>	<i>In reply fact sheets and application forms were sent. From this I discovered my product is not patentable. I also discovered the requirements in registering a Trade Mark.</i>
<i>Fax</i>	<i>A fax sent inquiring about the Food Standards Code, its rules and regulations.</i>	<i>In reply I received sheets. From these I learnt valid rules in labelling my product.</i>

Interview

(See Appendix 2 for interview questions.)

Results

Market aimed for:

Simply Divine has aimed for a niche market. The small business has targeted the Jewish community. It ensures that religious rules about food production are strictly enforced in the factory.

Ways of marketing:

- *Word of mouth*
- *Cold calls*
- *Taste testing in delicatessens and specialty shops.*

Designed a sophisticated label and logo. The name is 'Simply Divine' and the logo is 'The Heavenly Gourmet Desert'.

- *Profits have increased by 50% in the last year because of these strategies.*

Conclusion

Simply Divine created a niche market by adapting to the needs of the Jewish community. They distributed their product to speciality shops. The appeal of quality and sophistication is conveyed through their label and logo.

Recommendations

As a segment of my target market is the Japanese community, I will try to satisfy some of their needs just as Simply Divine did when marketing their product to their target market eg. Selling Kosher products to suit the Jewish community. I will accomplish this by creating new Japanese style flavours including Green Tea ice cream, and Red Bean ice cream to suit the Japanese communities taste preference. I will also maintain my original flavours to satisfy the other segments of my market.

I will use Simply Divine's 'naming' idea for promoting my product. I will keep the name, 'Frozen Temptations' and introduce the logo 'The irresistible Frozen Dessert'. Also to promote my product I will establish taste testing as Simply Divine has. However, with this I will also hand out pamphlets in order to promote my product.

Synthesis of Ideas Heading to the Development of the Marketing Strategy

In determining my products marketability I have drawn on a range of methods. These include survey, interview, observation, taste testing, phone and fax.

The following is the marketing strategy for my product. It was determined from the data collected as a result of these research methodologies:

- *I have determined my price to be approximately \$4.00*
- *I will distribute my product to all major supermarkets.*
- *Aim at a segmented market. These market segments include the Japanese community, the lactose intolerant and health aware consumers.*
- *My product must be marketed as a 'frozen confection' and the name 'Frozen Temptations' and logo 'The irresistible frozen dessert' will be registered as a Trade Mark.*
- *Taste testing and hand out pamphlets as a form of promotion.*

Critical Analysis of the Effectiveness of the Study

The research methodologies used to design my marketing strategy have been effective as they have addressed all of my aim and suited the criteria for the strategy to be effective. Through my research I have discovered the following which is vital in ensuring the success of my marketing strategy:

- *I have established my target market.*
- *I have found an appropriate location to distribute my product.*
- *I have approximated a price which will suit the consumers preference and also allow for profit.*
- *I have created a logo and name for the promotion of my product and will advertise through pamphlets and taste testing.*
- *I have investigated patenting and Trade Marking which lead to the registration of my name and logo as a Trade Mark.*
- *I have discovered the necessary rules and regulations according to the Food Standards Code for the labelling and selling of my product.*

Impact on Society

My non-dairy frozen confection will have a positive effect on society.

- *It will provide people who suffer from dairy allergies and lactose intolerance a tasty alternative.*
- *It will provide people who choose not to eat dairy products with a health alternative.*
- *It is sold at an affordable price.*
- *It will provide the Japanese community with a food they are familiar with.*

Impact on Environment

- *My product will have little negative impact on the environment. With any food product waste is inevitable. However all of the ingredients are made from renewable resources.*
- *Of greater impact is the production of electricity which runs the machines needed for making and freezing the ice confection. Fossil fuels used to generate electricity are non-renewable resources thus will have a negative effect on the environment.*
- *The packaging is non-recyclable. However, the containers are strong and versatile and can be reused as general storage containers.*

- *The pamphlets used for advertising are recyclable thus environmentally friendly.*

Ethical Implications

- *I will protect my name and logo by registering it through the Australian Trade Marks office.*
- *I will follow the Food Standards Code by labelling my products as a Frozen Confection in order to avoid confusion among consumers and so it is legal.*

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