

**2007 HSC Notes from
the Marking Centre
Design and Technology**

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2007 HSC NOTES FROM THE MARKING CENTRE

DESIGN AND TECHNOLOGY

Introduction

This document has been produced for the teachers and candidates of the Stage 6 course in Design and Technology. It contains comments on candidate responses to the 2007 Higher School Certificate examination, indicating the quality of the responses and highlighting their relative strengths and weaknesses.

This document should be read along with the relevant syllabus, the 2007 Higher School Certificate examination, the marking guidelines and other support documents which have been developed by the Board of Studies to assist in the teaching and learning of Design and Technology.

Teachers and candidates should be aware that examiners may ask questions that address the syllabus outcomes in a manner that requires candidates to respond by integrating their knowledge, understanding and skills developed through studying the course. This reflects the fact that the knowledge, understanding and skills developed through the study of discrete sections should accumulate to a more comprehensive understanding than may be described in each section separately.

Major Design Project

General Comments

Projects presented in 2007 represented a broad range of technologies and showcased the wide range of candidates' skills and abilities.

Candidates have become more aware of the processes of design development, from needs analysis to final evaluation and including the processes of production. The better Major Design Projects identified a genuine need rather than just stating a final outcome for the project.

Outsourcing may be necessary if the candidate is unable to complete the required task at school, but should not become an essential or major component of the project. Those candidates who outsource the bulk of their project are not able to demonstrate relevant syllabus outcomes.

Some projects and folios used or displayed practices that indicate students may not understand OHS requirements. Attention is drawn to Section 9.3.1.1 of the Board's Assessment Certification and Examination (ACE) Manual regarding health and safety issues in the development and selection of student projects, major works, bodies of work, exhibition and performance.

Increasingly, methods of communication such as digital images and multimedia presentations are being used to convey information to the HSC markers. Typically, the most successful Major Design Projects show development by models, scale models, hypothetical tests of concepts and design ideas, evidence of relevant experimentation and testing in addition to a strong and applied evaluation of the overall project. Better projects provided succinct summaries of their research, and demonstrated application of the results of that research. They also provided succinct, less detailed portfolios and provided real evidence of how they developed solutions to identified needs. Candidates are reminded that relevance of research and information is more important than extensive, irrelevant documentation. Many of the better projects were innovative and demonstrated

ongoing resolution of design problems in order to achieve a design solution. Candidates should be encouraged to use real evidence of development in model or prototyping form, photographic or brief video evidence where appropriate, and to summarise conclusions and place the source material within an appendix.

Multimedia projects are still popular and candidates are reminded that for projects of this nature, it is important that the folio demonstrate the development of and need for these projects. The better projects documented the evolution of the project, rather than simply providing the marker with a working model.

Project Proposal and Project Management

Better responses indicated that the candidate had initiated research early and spent time clearly identifying and exploring the need to be addressed in their project. Weaker responses tended to discuss or simply state what it was that the candidate wanted to make rather than providing a thorough investigation of a problem, situation, want or need.

In the weaker responses, it was obvious that the proposal and planning section of the folio had been finalised after the project was complete and therefore did not allow the candidate to demonstrate the evolution of the development process. Generic and non-specific information prevented candidates from demonstrating a clear understanding of their intention for the development of the project.

Assessment Criteria

Identification and exploration of the need

Better responses demonstrated the application of critical analysis skills to the investigation of the need and drew conclusions regarding their criteria for evaluation. The flow from need identification to the development of evaluative criteria provided candidates with focus and direction for the product, system or environment's development. Weaker responses tended to simply state what they proposed to make without identifying a genuine need and subsequently exploring opportunities for other solutions.

Areas of investigation

Better responses included a detailed analysis of the range of logical and relevant areas that they could possibly research, and the methodologies to be used, to inform the development of the product, system or environment, rather than listing some broad areas which may be considered in future research.

Criteria to evaluate success

The better responses considered the project proposal and the needs that the product, system or environment should meet, in many cases creating an assessment tool for use in the final evaluation of the success or otherwise of the product, system or environment. Better responses linked this work to an analysis of the functional and aesthetic aspects of design. Weaker responses tended to list the criteria without any analysis.

Action, time and finance plans and their application

Better responses used the action plan as an ongoing tool for assessment of progress and found it a management tool to help them achieve success. They frequently referred to it during the process and evaluated it regularly giving a self-evaluation of progress.

Some timelines that were presented clearly did not give specific details relevant to the project. Candidates need to add headings and stages that are relevant to their project in order to make it a well-formulated and useful management tool. Candidates need to develop their own timeline, specific to their project and themselves. It was often evident that many candidates completed the generic template after the completion of the project, thereby presenting a very obvious false representation.

Better responses had clear project management strategies applied, with quality original action plans in place from the commencement of the project, and evaluated throughout its development.

Finance planning was often quite poor and not a demonstration of actual planning, rather a documentation and listing of costs. Many candidates listed their source of income with a well-justified reason for the amount of money they allocated to their project. Many provided receipts to demonstrate all expenses. Better responses demonstrated a genuine effort to develop a budget based on available financial resources and likely costs and expenses.

Weaker responses were simply a collection of receipts after the event with no real evidence of financial planning or management. Little ongoing evaluation was evident with these projects and few financial decisions were justified.

Aspects of development and realisation, investigation and experimentation, prototype development, production, implementation and evaluation should be built into the process of planning. Candidates should be advised that it is appropriate to develop a plan of action and evaluate it during the project development. It may be necessary to deviate from this plan and it is then appropriate to document variations that may occur. It is essential, however, that the original documentation, written at the commencement of the project, remains as evidence of its early development.

Selection and use of ideas and resources

Better projects identified resources that could potentially be used for the project, then evaluated these resources and selected from the range. The selection of resources is part of project management. Many candidates used a table to succinctly document this process. Better responses linked the identification and justification of resources to the completed major design project.

Candidates were better able to demonstrate their understanding and application of design processes when they communicated the development of their design project in its natural order, rather than artificially structuring it to fit a series of headings. Candidates who merely listed the marking criteria as subheadings in their folio without the necessary information did not demonstrate the evolution of the project.

Project Development and Realisation

In this section, the development and realisation of the Major Design Project, the folio and product, system or environment, should be clearly evidenced and explained. Application of the conclusions of research should be evident in the development. This is best shown by models, scale and not-to-scale, made of a range of materials, simulations and, where appropriate, photographic evidence or

similar. The development and the results should be clear in the final product, system or environment. Successful projects included a 3D folio, where design development was evident in samples of modelled solutions. Lengthy written discussions that include information that is irrelevant to the project or this section of the folio do not assist candidates.

Better responses demonstrated an ability to critically assess existing designs and research relevant areas, which ultimately impact on the success of their final project. Candidates were able to distinguish between relevant and irrelevant research. They analysed their findings and conducted relevant tests and experiments, which ultimately impacted positively on their end result.

Weaker responses demonstrated little design development, presenting a predetermined project idea with little evidence of source or developmental research. The final design was shown immediately without any research and investigation into existing designs. They often included irrelevant testing, which unfortunately rarely had an impact on the final project. Many did not distinguish materials, tools and techniques. In many instances, tools were described but very few actually tested. Some candidates listed tests and experiments without evidence of ever having carried them out.

Assessment Criteria

Evidence of creativity – ideas generation, degree of difference and exploration of existing ideas

Better responses demonstrated a thorough understanding of a definition of innovation versus invention. A degree of difference in the ideas, technology use and/or final design was an acceptable indicator of these outcomes.

Consideration of design factors relevant to the Major Design Project

Though the design factors are explicitly listed in the syllabus, weaker responses did not relate these factors directly to their project. They simply listed these factors and wrote a definition of them rather than relating them to the product, system or environment they were developing. Better responses addressed these factors by actually considering them in context rather than listing them in isolation.

Documentation of research, experimentation and testing of design ideas, materials, tools and techniques

The best responses referred to the use of relevant and appropriate testing and created a broad range of model solutions to inform the design development. These responses drew their conclusions explicitly, with the evidence of the positive impact being annotated in the product, system or environment. Weaker responses tested and experimented unnecessarily or provided extensive, irrelevant documentation. Candidates need to carefully consider the reason(s) for testing, the method of testing and the application of the conclusions drawn from the testing.

Research that can be extracted from external and well-respected sources can be referenced or summarised in projects, but should not simply be downloaded and duplicated by candidates.

Application of conclusions

Those candidates who carried out relevant developmental processes did very well in providing evidence of their application of the conclusions drawn to their product, system or environment.

Identification and justification of ideas and resources

Better responses identified the resources used in the major design project and justified their application and value, while weaker responses just listed the resources used.

Evidence of the testing of design solutions and application of conclusions

Many responses showed no evidence of a process of a prototype or model, digital 3D modelling or mock-up development. Such processes of development enable candidates to demonstrate both the testing of solutions to design challenges that they meet as they progress, and the testing of whole concepts.

Use of communication and presentation techniques

Access to technology has provided candidates the opportunity to display a broad range of communication and presentation techniques in all aspects of product, systems and environment development. From written text to multimedia presentations, excellent use of the internet for research and person-to-person communication, candidates demonstrated a wide range of techniques they could apply appropriately.

Evidence and application of practical skills to produce a quality project

Successful projects demonstrated production of work at the highest technical level. This was evident in many products, systems and environments, and in a growing range of technologies. Many of the better responses tended to communicate their construction phase through the use of photographs, which outlined them completing various phases. Explicit instructions followed these photographs along with ongoing evaluations. This enabled the markers to identify that the candidates were clearly solving ongoing problems and making relevant decisions.

Better responses showed little use of outsourcing and, when used, it was well documented and justified. The majority of the product, system or environment was completed by them, demonstrating that they had developed many new skills and managed their time in an effective way.

Consideration of the practices in industrial/commercial settings as they relate to the Major Design Project

Better responses clearly demonstrated an understanding that the ‘practices’ referred to by the guidelines are the practices of both designing and producing. They discussed the whole process from needs identification through to production and compared their own practice with that of practising designers and producers.

Weaker responses generally named an industrial or commercial setting, and then failed to compare and contrast these processes with their own. In many instances this was a speculative comparison rather than a factual link to industrial or commercial settings. By evaluating the design, management and production techniques in these settings, the candidate is able to demonstrate a sound knowledge of the industrial and commercial practices along with their own.

Project Evaluation

Ongoing evaluation was again much stronger throughout folios. Many projects demonstrated ongoing problem-solving and decision-making processes by demonstrating how they would impact on the final product, system or environment. Many of these candidates referred to their criteria to evaluate success.

The better responses were thorough in relating their evaluation, both ongoing and final, to their project proposal work.

Final evaluation in relation to functional and aesthetic criteria was generally strong. Better responses included a photo of the final product, system or environment in its environment, for example, showing or perhaps modelling its successful operation. This demonstrated that there was a significant link between the final product, system or environment and the project proposal that was initially set by the candidate.

The final evaluation of the product, system or environment's impact on society and the environment continues to provide challenges for candidates. The better responses linked back to current trends in design. They discussed the uses of their product, system or environment and where it is going.

There was a stronger use of professional evaluations, but many responses failed to link such evaluations to how their project impacted on society as a whole. Many tended to include these evaluations without realising their significance or reflecting upon it.

In relation to evaluating environmental considerations, the best responses consistently discussed recycling issues with a detailed analysis. They clearly stated what impact their design had on the environment in terms of resource usage.

Assessment Criteria

Recording and application of evaluation procedures throughout the design project

The better responses recorded evaluative comments and procedures as they occurred. Better projects used incidental pages or notes throughout the folio or attached to their models of design development to emphasise their efforts at evaluation. The presentation of developing models and prototypes communicates clearly to markers that ongoing evaluation has occurred.

Analysis and evaluation of functional and aesthetic aspects of design

Better projects commenced this analysis in the early stages of development. They analysed functional and aesthetic criteria while developing their criteria to evaluate success. They then drew upon this in a final evaluation of their solution using functional and aesthetic criteria.

Final evaluation with respect to the project proposal and the project's impact on society and the environment

Societal impact still proved to be an area of evaluation that was difficult for many candidates. Environmental issues were better addressed, but rarely extended to life-cycle assessments of materials or of environmental impact of processes used. Successful projects related their criteria to evaluate success directly to their final evaluation.

Relationship of the final product, system or environment to the project proposal

Better responses provided a brief personal reflection relating back to the criteria to evaluate success. Weaker responses failed to draw a parallel between the product, system or environment and the criteria for success established in the project proposal.

Written Examination

Section I – Multiple Choice

Question	Correct Response
1	D
2	B
3	A
4	B
5	A
6	D
7	C
8	D
9	C
10	B

Section II

- (a)(i) Better responses sketched in general terms, two or more appropriate reasons for conducting research. These included finding things out; clarifying the purpose; giving direction or further direction; establishing consumers' likes and dislikes; enabling decision making; or providing relevant feedback.
- (ii) Better responses identified qualitative research and provided examples which demonstrated the appropriate use of such research. Weaker responses gave an incorrect definition of qualitative research or referred to the quality of the product, rather than the research method.
- (b)(i) Better responses interpreted and described the possible impact of the data provided in the two graphs. That is, mobile telephone subscribers rapidly increasing and shape 3 being the preferred telephone style. They made the relationship evident between this data and the direction of development of new telephones; for example, in future, design fixed line telephones to incorporate shape 3 style and mobile phone features. Weaker responses simply outlined one implication of the data provided.
- (ii) Better responses described an appropriate research method that could be used once a prototype had been developed; for example, product testing on a focus group of people. The best responses related the cause and effect of the research method to the improvement of the product. These responses explained the validity of the research and then described how the results could be used to further improve the product. Weaker responses only outlined a research method.
- (c) The better responses to this part clearly demonstrated a relationship between ethical issues and the choice of research methods. These responses identified the issues and provided points for and/or against, when deciding upon the choice of research methods. Better

responses gave examples such as privacy, security of information, offensive questioning techniques and protection of intellectual property, when demonstrating the impact ethical issues could have upon the collection of data. Weaker responses identified some ethical issues, and/or a research method, with limited discussion of any resulting impact.

Section III

Question 12

- (a) Better responses demonstrated a sound knowledge of the influence that systems in society have on future product and/or home design. These responses made specific reference to a variety of products presented in the stimulus material and explained how home designs could be modified due to the influence of outside systems. These responses explored the relationship that exists between systems at home and systems in society.

Weaker responses simply identified products directly from the stimulus material, or outlined features of either home or product design, or features of a system, without reference to how they influence each other.

- (b) Candidates were expected to use examples from the stimulus, their innovation case study, or their own personal experiences, in order to provide social impacts.

Better responses drew upon a variety of innovations and provided a detailed analysis of the relationships existing between the innovation and society. Some of these better responses focused upon the holistic impact of innovations as opposed to an emphasis on examples of specific innovations. They also clearly related the impacts to a variety of aspects of society, whether being individuals, members of different socio-economic groups, or society on a global scale. The implications on society were able to be drawn out through indicating not only the immediate impact, but also short and long-term consequences.

Weaker responses generally provided descriptions of innovations without providing a reference to their impact on society. These responses often only identified one innovation.

Question 13

- (a) Better responses clearly demonstrated the relationship between the criteria and the chosen method. They explained the methods used to establish the criteria and justified why the method was an appropriate choice for example, surveying the target market and analysing their responses in order to establish the specific criteria that are necessary for a successful design solution.

Weaker responses identified research methods that related to design production or simply listed criteria for evaluating the success of a product, system or environment.

- (b) Better responses demonstrated a sound knowledge of needs analysis and could articulate the relationship between ongoing and final evaluation, and overall success. These responses provided a range of examples to support their understanding and justification for the success of the product, system or environment.

Weaker responses demonstrated a limited understanding of needs analysis, though some of these could provide basic links between needs and/or evaluation and/or success.

Question 14

- (a) Better responses clearly addressed the relative importance of both function and aesthetics, providing specific examples; for example, durability, ease of use, obsolescence, colour, shape and graphics. These responses demonstrated the relationship between the factors of function and aesthetics, and their significance when designing solutions for societies at the bottom of the wealth pyramid.

Weaker responses focused primarily on functional factors. Some of these weaker responses provided a generic statement of aesthetics but did not demonstrate a link to the development of a solution.

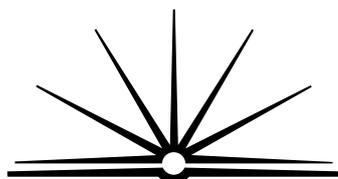
- (b) Better responses included specific examples of impacts, such as clean water, improved shelter, electricity and improved communications. These responses analysed both immediate and ongoing implications, such as improved health, access to education, immunisation and skills acquisition leading to future employment.

Weaker responses identified some examples of technology but did not demonstrate any resulting impacts upon the societies at the bottom of the wealth pyramid.

Design and Technology

2007 HSC Examination Mapping Grid

Question	Marks	Content	Syllabus outcomes
Section I			
1	1	Collaborative designing	H6.1
2	1	Factors affecting design	H1.1
3	1	Work of designers	H1.2
4	1	Ethical issues	H2.2
5	1	Ethics and environment	H2.2
6	1	Processes used by designers	H1.2
7	1	Factors affecting design	H1.1
8	1	Processes used by designers	H1.1
9	1	Ecological issues in society	H6.2
10	1	Processes to develop innovations	H3.2
Section II			
11 (a) (i)	2	Research methods	H5.2
11 (a) (ii)	2	Data analysis	H5.2
11 (b) (i)	3	Interpretation and application of research	H5.2
11 (b) (ii)	3	Application of research methods	H5.2
11 (c)	5	Research and ethical issues	H4.2
Section III			
12 (a)	6	Innovations impact on society	H2.2
12 (b)	9	Factors that impact on success of innovation	H3.1
13 (a)	6	Criteria to evaluate designing and its success	H4.1
13 (b)	9	Needs analysis ongoing and final evaluation	H4.1, H4.3
14 (a)	6	Function and aesthetics	H1.1
14 (b)	9	Societal issues in designing	H2.1



B O A R D O F S T U D I E S
NEW SOUTH WALES

2007 HSC Design and Technology Marking Guidelines

Section II

Question 11 (a) (i)

Outcomes assessed: H5.2

MARKING GUIDELINES

Criteria	Marks
• Sketches in general terms more than ONE reason for conducting research	2
• Identifies ONE reason for conducting research	1

Question 11 (a) (ii)

Outcomes assessed: H5.2

MARKING GUIDELINES

Criteria	Marks
• Sketches in general terms more than ONE example of appropriate use of qualitative research	2
• Identifies ONE example of appropriate use of qualitative research	1

Question 11 (b) (i)*Outcomes assessed: H5.2***MARKING GUIDELINES**

Criteria	Marks
• Makes the relationship evident between the data provided AND the direction of the development of new telephone products	3
• Describes the possible impact of the data provided in determining the direction of development of new telephone products	2
• Outlines an implication of the data provided on direction of development	1

Question 11 (b) (ii)*Outcomes assessed: H5.2***MARKING GUIDELINES**

Criteria	Marks
• Outlines an appropriate research method AND relates the cause and effect of the research to the improvement of the product	3
• Outlines an appropriate research method and how it can improve the product OR • Describes an appropriate research method	2
• Outlines a research method	1

Question 11 (c)*Outcomes assessed: H4.2***MARKING GUIDELINES**

Criteria	Marks
• Provides points for and/or against the impact of ethical issues upon the choice of research methods selected	4–5
• Describes the impact of ethical issues upon the choice of a research method	2–3
• Outlines an ethical issue	1

Section III

Question 12 (a)

Outcomes assessed: H2.2

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> Makes the relationship evident between home and/or product design and systems AND provides why and/or how the design is influenced Makes specific links to stimulus examples 	5–6
<ul style="list-style-type: none"> Describes how home and/or product design can be influenced by systems Refers to stimulus examples 	3–4
<ul style="list-style-type: none"> Outlines features in future home or product design OR <ul style="list-style-type: none"> Outlines features in systems development 	2
<ul style="list-style-type: none"> Identifies a feature in future home or product design OR <ul style="list-style-type: none"> Identifies a feature in systems development 	1

Question 12 (b)

Outcomes assessed: H3.1

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> Draws out the relationship between society and innovations AND relates the implications of the impact on society 	8–9
<ul style="list-style-type: none"> Explains the relationship between society and innovations by relating the cause and effect of the impact of the innovation 	6–7
<ul style="list-style-type: none"> Provides characteristics and features that demonstrate the impact of innovations on society 	4–5
<ul style="list-style-type: none"> Outlines components of a system that impact on society OR <ul style="list-style-type: none"> Outlines an innovation that impacts on society 	2–3
<ul style="list-style-type: none"> Identifies an innovation that impacts on society OR <ul style="list-style-type: none"> Identifies a system that impacts on society 	1

Question 13 (a)
Outcomes assessed: H4.1
MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> Makes the relationship evident between “criteria to evaluate success” AND the methods used to develop them Relates the cause and effect by drawing upon examples 	5–6
<ul style="list-style-type: none"> Describes, using examples, the methods used to develop criteria to evaluate success 	3–4
<ul style="list-style-type: none"> Outlines the main features of criteria to evaluate success OR <ul style="list-style-type: none"> Outlines a method to develop criteria 	2
<ul style="list-style-type: none"> Identifies criteria for evaluating success OR <ul style="list-style-type: none"> Identifies a method to develop criteria 	1

Question 13 (b)
Outcomes assessed: H4.1, H4.3
MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> Draws out AND relates the implications and relationship between the analysis of needs, ongoing and final evaluation AND the overall success of a product, system or environment 	8–9
<ul style="list-style-type: none"> Explains the analysis of needs, the purpose of evaluation and success of products OR <ul style="list-style-type: none"> Explains links between needs analysis and/or ongoing and final evaluation and/or success 	6–7
<ul style="list-style-type: none"> Describes needs analysis AND evaluation AND how products are successful without linking these OR <ul style="list-style-type: none"> Describes links between TWO of: needs analysis, evaluation or success 	4–5
<ul style="list-style-type: none"> Outlines a link between needs analysis and evaluation and/or success 	2–3
<ul style="list-style-type: none"> Identifies needs analysis or evaluation or success in relation to designing and producing 	1

Question 14 (a)*Outcomes assessed: H1.1***MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none">• Makes evident the relationships between the relative importance of function AND of aesthetics to the position of people at the bottom of the wealth pyramid	5–6
<ul style="list-style-type: none">• Describes the link between the relative importance of function and/or aesthetics to the position of people at the bottom of the wealth pyramid	3–4
<ul style="list-style-type: none">• Outlines a relevant functional factor or aesthetic factor	2
<ul style="list-style-type: none">• Identifies a relevant functional or aesthetic factor	1

Question 14 (b)*Outcomes assessed: H2.1***MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none">• Draws out AND relates the implications of introducing top of the pyramid technologies to bottom of the pyramid societies• Identifies the components of technologies and societies and the relationship between them	8–9
<ul style="list-style-type: none">• Explains the impact that top of the pyramid technologies could have on bottom of the pyramid societies by relating cause and effect	6–7
<ul style="list-style-type: none">• Describes the impact of the technology upon societies by providing characteristics and features of the impact	4–5
<ul style="list-style-type: none">• Outlines a technology from the top of the pyramid by indicating the main features of it <p>OR</p> <ul style="list-style-type: none">• Outlines an impact	2–3
<ul style="list-style-type: none">• Identifies an impact and/or a technology	1