



## External Assessment Report 2010

Subject	<b>Product Design</b>
Level	<b>Higher</b>

The statistics used in this report are pre-appeal.

This report provides information on the performance of candidates which it is hoped will be useful to teachers/lecturers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding. It would be helpful to read this report in conjunction with the published question papers and marking instructions for the Examination.

# Comments on candidate performance

## General comments

There was an encouraging improvement in performance in the written paper partly due to the question format being more accessible, but mainly due to improved candidate responses.

Markers once again indicated that there were some outstanding Design Assignment folios accruing full or near full marks.

As in previous years, candidates generally scored higher marks in the Design Assignment than in the written paper.

Year	2006	2007	2008	2009	2010
<b>Written Paper</b>					
<b>Average Mark</b>	35	35.3	35.3	33.2	35.9
<b>Design Assignment</b>					
<b>Average Mark</b>	42.6	41.2	42.3	42.5	42.6

## Written Paper

There was minimal change to the format of the paper although it was constructed so that more questions were set out into sub sections. This broke up the mark allocation into smaller parts.

### Question 1 (30 marks)

Generally speaking, answers to question 1 showed a similar level of response to last year.

- a) As in previous years, many candidates' specification points were too simplistic and reminiscent of Standard Grade. Specification points are generic for this question and lifting data from the question paper will not accrue marks. The information given is to enable candidates to identify issues which would appear in a Design Specification. Technical Specification points will not gain marks if they are simply lifted from the data given.
- b) Answered quite well.
- c) A variety of responses varying from excellent to very poor. Many candidates did not answer this question in terms of manufacturing processes. Marks are not awarded for identification of the processes but the justification for the use of appropriate manufacturing methods.
- d) Slightly disappointing.
- e) Answered very well.

- f) In general candidates have difficulty when discussing ergonomic issues.

**Question 2 (6 marks)**

Answered quite well although many candidates thought that working drawings were pre-production with some answers suggesting they were used in the development stages as a means of developing the product, NOT pre-manufacture with regard to manufacturing process or material.

**Question 3 (10 marks)**

Candidates' performance overall was very good.

- a) (2 marks) This is a familiar question which has been asked in a variety of forms over past examinations. Answered very well.
- b) (4 marks) Again a familiar topic made easier by being split into two subsections with which candidates coped well.
- c) (2 marks) Answered reasonably well.
- d) (2 marks) Answered well.

**Question 4 (5 marks)**

- a) (2 marks) Mixed responses: some very good answers, but the majority of responses were not extended enough to gain full marks.
- b) (3 marks) Again this question exposed the limited knowledge of the difference between thermo setting and thermoplastic materials and their properties. The performance in this question was disappointing.

**Question 5 (6 marks)**

- a) (4 marks) Answers were disappointing particularly for researching information for production planning.
- b) (2 marks) Mixed responses for what should have been a straightforward question.

**Question 6 (7 marks)**

- a) (3 marks) Not answered particularly well. Responses showed a lack of knowledge in engineering manufacturing processes. For example, deformation of sheet materials to improve the mechanical properties of components. Candidates frequently respond by stating that a process is 'quick' or 'cheap', but they will not gain marks for this level of response.
- b) (2 marks) Mixed responses to this question.
- c) (2 marks) Mixed responses to this question.

### Question 7 (6 marks)

- a) (2 marks) Answered reasonably well. Standard question which has been examined before.
- b) (4 marks) Poorly answered question even after split to target responses. A poor understanding of IPR issues was exposed.

### Design Assignment

Centres were, as last year, given a choice of design options based upon a theme. The range of tasks was devised to give as much opportunity as possible to candidates while still keeping a level of control on the assessment process.

As usual, candidates were given four scenarios; giving an opportunity for them to show creativity and expression. **This is done to enable candidates with a wide variety of talents and a wide background in knowledge to be able to show their capabilities. It is essential that centres encourage candidates to choose the topic they are about to embark upon carefully.**

The Design Assignment followed the same format where candidates are limited to eight pages of material. There was little evidence of candidates producing complex front covers and contents pages which are superfluous in the design folio. Once again the addition of page numbers by centres this year greatly assisted assessment.

The format was generally followed; there were few instances of folios exceeding eight pages.

### Section 1 Initial Ideas (15 marks)

This section is generally done well by candidates although decisions reached are still not highlighted and referred back to the specification.

In some cases **candidates still use four or five pages** for this section. This does not leave adequate opportunity to gain marks in the rest of the folio. Some time spent in class looking at the balance of their work and relating this to the Design Assignment Specification could minimise this problem.

### Section 2 Development of ideas towards a Design Proposal (30 marks)

This is where the more able candidates tend to gain significantly more marks than others.

Developments of ideas can be aesthetic, can use information from the research material supplied with the Design Assignment topics, can look at construction/production methods, standard parts etc. All developments should show progression and sketches must be well annotated and relevant to the topic. Decisions should be being made throughout the folio and highlighted. **Candidates who score high marks in this section usually consider technical as well as aesthetic development.**

This section is worth 30 marks and should be where most of the marks are gained by candidates. This was not the case in some instances; however there was once again an improvement in candidate responses in this section.

Candidates who did not score well tended to show a lack of knowledge in either manufacturing process or related materials.

### **Section 3 Communication**

This is split into three sections.

#### **Section 3a Communication of ideas towards a design proposal (10 marks)**

The marks awarded for this section were for the communication information, both graphical and textual, throughout the Design Assignment. Examiners are looking for links to the information given, use of the specification and progression of ideas and developments towards a final design proposal.

The candidate's folios which scored well clearly demonstrated this.

#### **Section 3b Recording decisions made in producing a design proposal**

Again marks are allocated right across the folio for this. In many cases decisions made were not justified and evaluated so that it was not clear why they had been reached. This area is still a problem for candidates.

#### **Section 3c Communication of Design Proposal**

More centres are now using computer modelling in this section which is aiding presentations for candidates with less ability in manual graphics. It is encouraging to see that there are still examples of impressive manual graphics.

### **General comments on Design Assignment**

Markers indicated that the level of response was similar to last year. There were some outstanding folios.

Markers also commented that the topics this year allowed candidates more opportunity to show technical development. There were also instances of impressive use of modelling to research solutions and inform decisions in the development stage.

The use of the research information given is minimal in some cases which is why some candidates don't perform as well in the development stage of the Design Assignment. This is particularly the case with the anthropometric data.

### **Areas in which candidates performed well**

In the written paper candidates performed well in general in Questions 1, 2 and 3. This is with the exception of Question 1f where the responses were disappointing.

In general, candidates performed well in the generation of ideas stage of the Design Assignment.

## **Areas which candidates found demanding**

### **Written Paper**

Candidates found Questions 6 (manufacturing, standard components, JIT, outsourcing etc) and 7 (IPR) demanding in the question paper.

### **Design Assignment**

Candidates sometimes do not leave themselves enough room to adequately develop their ideas. There is still some difficulty with this section for less able candidates.

The classroom teacher has a very important role in guiding the candidate at the preparation stage before they commence their Design Assignments. Candidates must be encouraged to choose the task carefully so that the topic suits their strengths and gives them the opportunity to perform to their best ability.

Some design tasks allow more creativity aesthetically while others allow for more technical detail and development.

## **Advice to centres for preparation of future candidates**

Make sure that the exemplar material on SQA's website is being used to illustrate the format for the Design Assignment.

SQA's Understanding Standards website is a valuable source of information on assessment procedures.

While there is an understandable temptation to use more than 10 hours for the Design Assignment, evidence suggests that this has an adverse effect upon candidates' performance in the written paper.

The classroom teacher has an important role in teaching pupils about planning the structure of a Design Assignment to make best use of the eight pages available. The choice of topic is also important. Guidance in choosing a topic that will allow the candidate to show their strengths is vital. This should not however result in an entire cohort being directed to a topic.

Preparation for the Written Paper must consist of training in examination techniques and acceptable responses. Candidates who have not had much practice at writing extended answers are not likely to be able to do so in the final examination. Candidates should be encouraged to discuss, debate, and argue so that they can acquire a technical vocabulary that will enable them to provide acceptable answers to questions in the final examination.

When preparing preliminary exams, questions should be in line with SQA guidelines and sourced from recent examinations. In particular, if using past papers it is advised to source materials from no earlier than the exemplar paper for Higher Product Design (produced for Diet 2005).

## Statistical information: update on Courses

Number of resulted entries in 2009	2390
Number of resulted entries in 2010	2462

## Statistical information: performance of candidates

### Distribution of Course awards including grade boundaries

Distribution of Course awards	%	Cum. %	Number of candidates	Lowest mark
Maximum Mark — 140				
A	16.2%	16.2%	400	98
B	25.4%	41.7%	626	83
C	29.3%	71.0%	722	69
D	11.9%	82.9%	293	62
No award	17.1%	100.0%	421	—

### General commentary on grade boundaries

While SQA aims to set examinations and create marking instructions which will allow a competent candidate to score a minimum of 50% of the available marks (the notional C boundary) and a well prepared, very competent candidate to score at least 70% of the available marks (the notional A boundary), it is very challenging to get the standard on target every year, in every subject at every level.

Each year, therefore, SQA holds a grade boundary meeting for each subject at each level where it brings together all the information available (statistical and judgemental). The Principal Assessor and SQA Qualifications Manager meet with the relevant SQA Head of Service and Statistician to discuss the evidence and make decisions. The meetings are chaired by members of the management team at SQA.

The grade boundaries can be adjusted downwards if there is evidence that the exam is more challenging than usual, allowing the pass rate to be unaffected by this circumstance.

The grade boundaries can be adjusted upwards if there is evidence that the exam is less challenging than usual, allowing the pass rate to be unaffected by this circumstance.

Where standards are comparable to previous years, similar grade boundaries are maintained.

An exam paper at a particular level in a subject in one year tends to have a marginally different set of grade boundaries from exam papers in that subject at that level in other years. This is because the particular questions, and the mix of questions are different. This is also the case for exams set in centres. If SQA has already altered a boundary in a particular year in say Higher Chemistry this does not mean that centres should necessarily alter boundaries in their prelim exam in Higher Chemistry. The two are not that closely related as they do not contain identical questions.

SQA's main aim is to be fair to candidates across all subjects and all levels and maintain comparable standards across the years, even as Arrangements evolve and change.