DESIGN TECHNOLOGY

Overall grade boundaries

Higher level

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 17	18 - 33	34 - 43	44 - 55	56 - 66	67 - 78	79 - 100

Standard level

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 16	17 - 32	33 - 44	45 - 55	56 - 66	67 - 77	78 - 100

Introduction

The examining team understands the importance of this report and past papers in preparing candidates for future examinations. Consequently we welcome feedback on the report and the examinations. The most obvious way to provide this feedback is through the G2 forms.

Teachers have three options for submitting the G2 forms – through either IBNET or the OCC, or in hard copy form. The number of G2 forms submitted for this examination session was the highest we have ever received, with almost 30% of schools responding. Thank you for your involvement and feedback in this way. The number of forms received was as follows:

G2 Comments		
	HL	SL
P1	10	10
P2	7	9
P3	8	6

The G2 forms are extremely valuable in providing feedback to the examining team and are always studied carefully and discussed extensively during grade award meetings. Comments from the G2s are fed back to other teachers via this subject report.

While the percentage of schools responding through the G2 forms is good, of course we would welcome more to help ensure that the feedback is representative. The examining team is receiving a good balance of positive and constructive feedback, so thank you.

PLEASE COMPLETE A G2 FORM AFTER EACH EXAMINATION EVEN IF IT TO PROVIDE NO COMMENTS BUT JUST TO LET THE EXAMINING TEAM KNOW THAT THERE WERE NO PROBLEMS.

This session has seen 369 candidates (13 new schools) being examined at SL, an 85% increase over May 2006; and 349 candidates (6 new schools) at HL, an 11% increase over May 2006. The dramatic increase in candidates sitting SL examinations is the outstanding

feature of this examination session. The maximum number of candidates from any one school is 44 (a new school) and the minimum is one. These numbers represent continued significant growth in Design Technology, and the highest percentage increase in the history of the subject.

Grade boundaries are determined by matching the Grade Descriptors for Group 4 to the evidence available from marked scripts. Each paper is set in a way that ensures that it provides enough evidence to enable the use of the Grade Descriptors and also to ensure that there is appropriate syllabus coverage and that the papers are appropriately discriminating. Grade award meetings first determine the three/four boundary by inspection of the scripts for each component, moving on to the six/seven boundary and then the two/three boundary. Other grade boundaries are determined by interpolation from these three boundaries. Paper 1 boundaries are set with reference to the Paper 2 boundaries as the Papers 1 and 2 have the same syllabus coverage.

Internal assessment

Component grade boundaries

Higher level

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 5	6 - 11	12 - 15	16 - 19	20 - 23	24 - 27	28 - 36

Standard level

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 5	6 - 11	12 - 15	16 - 19	20 - 23	24 - 27	28 - 36

The range and suitability of the work submitted

There continues to be an increase in the number of schools opting to teach Design Technology and it is encouraging to see the number of candidate entries grow in existing centres. Most of the new schools submitted work of a suitable nature, but closer examination of the assessment criteria and better guidance is required if candidates are to achieve higher marks. Work ranged from small design and make activities through to laboratory based experiments, as well as some challenging project work. Those schools that are established in the teaching of IB Design Technology tend to do better when developing a course structure for IA. Schools that adopt the design and make route for small investigations do seem to have fared better when addressing the assessment criteria, but not all areas were always done well. It is advised to use coursework as a support exercise in order to help students understand the theoretical nature of the subject. Small lab based investigations tend to require less time than design and make tasks and the integration of such assignments into the course structure is to be encouraged. The topics covered by coursework should be entered on the form 4/PSOW along with the time taken for each investigation. This helps the

moderator when providing feedback to centres regarding course structure. Teachers support materials/project briefs should be attached to the sample of work.

As marks need to be highlighted on the form for each assessment heading, one of the marks must be for the design project and the other for any of the other investigations. All work that has been highlighted, along with evidence of the group 4 project, should be sent for moderation. Where this did not take place more evidence of work was requested from schools. Other elements of coursework are not required for moderation unless a teacher deems it appropriate.

In a number of schools there is still some confusion over what should be contained within the project report and logbook. The logbook is not formally assessed, but reference should be made to numbered pages throughout the folio if work is integral to the final report. Most samples are presented in an organized structure and clearly labelled. Where possible work should be flagged to show where the teacher has assessed each criterion.

Photocopied work should be easy to read and sketches should be easily identifiable. Colour photocopies would be preferred where this is deemed important to clarify the assessment mark for ideas and development.

Some of the work submitted was disorganized and presented in an inappropriate format. To avoid this teachers are encouraged to send an individual student sample per folder/folio with the form 4/PSOW attached. Dividers should be used to indicate the start of different investigations.

Candidate performance against each criterion

P1(a): Most candidates seem to fare well in this section, but candidates had lost marks where all of the criteria had not been addressed under each aspect. Common errors included a repetition of a problem set by the class teacher and the omission of any reference to constraints. When using the design project assessment criteria, students should consider the feasibility of the study and produce a detailed specification.

P1(b): Most candidates displayed evidence of planning, but methods did not always control the variables. Those who included annotated diagrams did seem to fare better. When considering the design project some candidates omitted a detailed plan of action and material list. Materials and processes must be included if students are to achieve a high mark under this heading. Gantt charts are to be encouraged, but time intervals must be realistic. Those who had written their plan in retrospect failed to address some of the assessment criteria. Evidence of ongoing work could be in the form of photographs and annotation. A Gantt chart can be used to plan an overview of student time for the design and make project, but planning for making must be considered in greater detail after development has been finalized.

DC: Smaller investigations where candidates had to collect ‘raw’ quantitative data offered ample opportunity to address the assessment criteria. Where candidates had completed a literature search, the data allowed insufficient identification of uncertainties and errors in DPP. Literature search assignments on their own are discouraged unless linked to a design and make activity. The design project allows candidates to address research through identifying materials, ergonomics, existing products, user needs, environmental concerns and problem specific data, but some candidates had omitted essential data in order to solve the problem. Students should fully analyze the brief in PI(a) if they are prioritizing strategies in which to

collect focused data. Planning the collection of research data is to be encouraged and sources identified. Those that achieved a high mark in this section displayed evidence of focused research that had been annotated to indicate its relevance in order to solve the design problem and answer the analysis. Not all candidates design ideas were supported by an initial evaluation.

DPP: Most candidates addressed the majority of the assessment criteria, but detailed annotation and careful presentation of improvements was not always considered. Drawings and evidence of modelling should be presented in an appropriate format (orthographic drawings). The use of CAD is to be encouraged. Some candidates developed their chosen idea by using a range of sketches and modelling, but in most cases the quality of working drawings did not offer sufficient detail for the product to be realized. Modelling using a wide range of materials is to be encouraged. Teachers should consider how card, manufactured boards, Styrofoam, etc can be used to aid model development. Most candidates omitted the need to state 'final specifications'.

CE: In some cases, inadequate time had been devoted to completing a thorough evaluation/conclusion. Some candidates only offered superficial personal evaluations with no consideration being made to address the specification and suggest realistic improvements. Students should be encouraged to test their outcomes in the area for which they had been designed and suggest improvements in sketches. The more organised candidates did leave adequate time to address the criteria to a satisfactory standard. Most candidates omitted the need to state 'modified specifications'. For lab-based investigations students should draw a conclusion to the stated hypothesis, evaluate procedures and state how the method of collecting data could be further improved.

Recommendations for the teaching of future candidates

IA should be integral to the teaching of subject content and students should be given appropriate time to complete work to a satisfactory standard. Teachers are advised not to try and conduct investigations where they have limited resources. Where workshop equipment is limited students may be better placed to consider a problem that addresses a need that will not need specialized resources. Packaging projects need very little specialized equipment and offer ample opportunity to explore the design cycle. Small design and make activities generally require more time than lab based experiments, but are necessary if students are to develop the necessary skills to undertake the design project. The teaching of modelling skills required to improve the marks of DPP is to be encouraged.

Where students complete project work in small groups or teams, evidence of individual write-ups is required if highlighted for moderation.

The use of the OCC and attendance at teacher training workshops is to be encouraged if teachers and students are to become more confident in the teaching of design technology.

Higher level paper one

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 10	11 - 15	16 - 20	21 - 24	25 - 28	29 - 32	33 - 39

The mean marks for HL Paper 1 are summarized in the table below.

Examination Session	**HL P1 Mean mark**
May 2005	26.4
May 2006	27.8
May 2007	26.2

The G2 responses indicate that three teachers thought that the paper was a little more difficult than last year, which may be reflected in the slightly lower mean score compared with last year. However all teachers indicated that they felt the level of difficulty was appropriate.

With the increase in candidates in 2007 compared with 2006, the examining team considered the influence of the new schools on the mean scores, and was gratified to note that the candidates from new schools performed just slightly better than candidates from schools who had done Design Technology HL before.

General comments

Ten teachers completed G2's for this component, four of whom judged the paper as a similar standard to last year, two thought it was a little more difficult and one thought it was much more difficult. All ten suggested it was an appropriate level of difficulty, five said syllabus coverage was satisfactory and five said it was good; two said clarity of wording was poor, three satisfactory and five said it was good; four said the presentation of the paper was satisfactory and six said it was good.

Two teachers made general comments, one that it was a good paper and suitably testing. Another teacher felt that there was too much 'elaborated English' in the paper, particularly for candidates for whom English is a second language. Unfortunately the teacher did not provide specific examples, but the examining team appreciates the comment and will make a renewed effort to ensure the standard of English is both correct and accessible. A number of teachers made specific comments which are addressed below.

One teacher commented that Q5, about paper prototyping, was off the current syllabus (though it is included in the new guide). While this is true, the examining team felt that the nature of paper prototyping was adequately explained in Figure 1 and in the stem of the question, and represented a good example of students applying knowledge to a new context. The question was not really about paper prototyping, but about user research and user trial. The Difficulty Index for this question indicates students did not find it difficult.

It was pointed out by one teacher that in Q 32, answers A and B could be considered correct, given AS 8.9.2 of the syllabus and the glossary definition of Young's Modulus being the 'stiffness of a material'. The examining team agrees with this perception, and although the statistics indicate that it is not a bad question, the decision was made to delete it from the examination.

One teacher stated that Q 33 was ambiguous because in some instances a factor of safety of less than one may be used in order to protect certain parts of a mechanism, for example, by ensuring failure of a particular component in order to protect the rest of the mechanism. It is the examining team's understanding that the determination of the 'normal maximum load' element of the factor of safety formula is the load that is considered to be the appropriate maximum for that context, so for the same parts it may vary from context to context. If the factor of safety was less than one for a component then it would fail before reaching its maximum load.

Students found this to be a difficult question, with the majority choosing (D) as the correct response. However this response is less correct because regular inspection and maintenance would be a feature of low factor of safety designs, not high factor of safety designs.

A teacher commented on the use of a case study for Q 36. This is a new aspect of Paper 1s, and is an attempt to provide a more interesting paper and also to provide a context to which students can apply their knowledge. The comment was made that this involved extra reading, which would be OK if the students had reading time. The examination team appreciates this comment, and attempts will be made in future to minimize the amount of reading that students have to do in this section. In addition, a word count will be done on a number of papers to ensure that a case study does not significantly increase the number of words to be read.

It is interesting to note that, unlike some other subjects, there are very few blank answers on the Design Technology Paper 1's, indicating that candidates have enough time to complete the paper.

One teacher asked if paper manufacturing, used in Q 40, was part of the current syllabus. While it is not, the example was included in the paper to test student's ability to apply their syllabus knowledge to a new context. The statistics indicate that most candidates found it quite an easy question.

In addition, it was noted by another teacher that the large gap between Q 39 and 40 gave the impression that 39 was the last question of the paper. This was done because Q 40 would not fit on the page after Q 39, and it is a policy not to split questions.

Candidates may need to be reminded that if the message "turn over" appears at the bottom of the page then there are more questions. The answer key is also a clue to the number of questions on the paper – all 40 boxes must be filled for an HL paper.

The table below indicates, in question order, how difficult questions were perceived to be as determined by candidate performance – the higher the difficulty index, the easier the question! The * shows the correct answer and the numbers represent the number of candidates providing each individual response.

In addition, a discrimination index is calculated. This compares the performance of the top 25% of candidates on a particular question with the top 25% of candidates overall and can vary between 0.00 and 1.00. With such a small candidacy the discrimination index is a less

useful tool than it is in large entry subjects. Although the discrimination indices are not published as part of the subject report, all questions achieving a low or negative discrimination index are discussed at the grade award meeting.

Question	A	B	C	D	Difficulty Index
1	27	23	15	283*	81.32
2	51	9	8	280*	80.46
3	230*	2	100	15	66.09
4	35	255*	37	21	73.28
5	253*	47	20	27	72.70
6	29	297*	10	12	85.34
7	36	91	117	104*	29.89
8	333*	5	9	1	95.69
9	21	5	317*	4	91.09
10	43	7	133*	165	38.22
11	2	342*	2	2	98.28
12	6	6	329*	6	94.54
13	127*	16	28	177	36.49
14	69	224*	25	30	64.37
15	26	14	257*	50	73.85
16	66	75	157*	50	45.11
17	228*	35	72	12	65.52
18	6	11	20	311*	89.37
19	153*	16	41	138	43.97
20	32	4	7	305*	87.64
21	52*	99	31	166	14.94
22	37	24	25	262*	75.29
23	22	25	149	151*	43.39
24	79	145*	61	62	41.67
25	54	44	37	212*	60.92
26	15	6	322*	5	92.53
27	36	267*	2	43	76.72
28	48	22	266*	12	76.44
29	331*	16	1	0	95.11
30	63	191*	39	55	54.89
31	92	176*	47	32	50.57
32	157	110	40	40	0
33	40	106*	37	163	30.46
34	40	21	76	209*	60.06
35	256*	5	66	20	73.56
36	62	26	216*	44	62.07
37	46	12	261*	29	75
38	71	143	38	96*	27.59
39	43	254*	27	24	72.99
40	9	15	264*	59	75.86

The examining team analysed the statistics on all the questions, and while none had a negative discrimination index, those questions where a significant number of candidates selected an incorrect option were more closely scrutinized. These are discussed below.

The confusion that is evident in Q 7 seems to be because of a lack of understanding of percentiles. A percentile range is ‘the proportion of a population at or less than a given value’,

so by considering those up to the 5th percentile would be considering those who have a short reach envelope thus ensuring maximum numbers would be able to reach the items within the workspace.

Many candidates selected cutting as an example of a shaping process in Q 10, but cutting is a wasting process, weaving is a type of shaping (AS 4.1.4).

In Q 13 a majority of candidates incorrectly selected option D as the answer. This is not correct because variable costs would increase as a result of automating a mechanized production process because the volume of output would increase.

In Q 21, the majority of candidates selected Option III – the reduction of moisture content, to be included in their answer. This seems to be the result of confusion between treating and seasoning wood where seasoning is to reduce moisture content, but treating, which is what the question is asking about, relates to aesthetics and micro-organism attack (AS 7.1.8 – 7.1.9)

The majority of candidates selected option B as correct in Q 38, while the correct answer was D. B is not correct because the introduction of technologies to match the capabilities of the local population would cost more initially, and so would not enhance short-term profitability.

Higher level paper two

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0-9	10-18	19-22	23-30	31-39	40-47	48-60

General comments

Paper 2 is divided into two sections: Section A and Section B. Section A is worth 40 marks and comprises six questions – a data-based question (question 1) worth 20 marks and five questions worth 4 marks each to provide syllabus coverage. Students are required to answer all six questions in Section A. Section B comprises three questions each worth 20 marks, of which students are required to answer one question. Each question in Section B comprises three parts with each part divided into two or three sub-sections. The questions are contextualized by the provision of stimulus material – generally a photograph reflecting a particular design scenario and the questions posed explore different aspects of the design scenario to provide syllabus coverage. Throughout the paper the examining team tries to ensure that evidence will be available to enable the determination of the grade boundaries through the application of the Group 4 Grade Descriptors.

Of the seven G2 comments received for this paper, five were from schools who had taken this subject in previous sessions. All five commented that the paper was of a similar standard to the previous year. The mean mark for this paper (M2007) was 34.8 compared with 32.1 for M2006, 36.4 for M2005 and 34.5 for M2004. There were 38 new Schools providing 42 candidates who performed across the range (4-53!). This excellent performance by new schools is extremely pleasing. A special word of congratulations to them. The mean of 34.8

compared with 32.1 last year would suggest that the students did not find the paper more difficult but if anything slightly easier. There certainly were no questions on the paper which completely flummoxed the students which can throw the mean mark out. Notwithstanding comparisons with previous sessions, all seven G2s said the paper was an appropriate level of difficulty, that the paper was either satisfactory (4) or good syllabus coverage (3), that the clarity of wording was satisfactory (4) or good (3) and that the presentation of the paper was satisfactory (4) or good (3).

The strengths and weaknesses of the candidates in the treatment of individual questions

Section A

It is probably worth reminding teachers that the point of Question 1 is that it is to provide the opportunity for students to demonstrate data analysis and problem-solving skills and should be something that is off syllabus and providing an unfamiliar context for the demonstration of these skills. Most of the average and above average students coped well with the question and there were no obvious problems.

Question 1 (a) (i) required students to calculate the length of a self-adhesive label required for the base of the bottle. A value for π was provided as was the diameter of the bottle so the answer was πd/2. Most students were able to do this. Question 1 (a) (ii) required students to calculate the number of rolls of labels that would be required for each work shift when the production line is running at maximum speed (i.e. 440 glass bottles per minute). 440 x 60 x 8 is therefore the maximum number of bottles and at 36000 labels per roll will require 5.87 rolls which needed to be rounded up to 6 rolls. Most students were able to do this at least in part. Some did not round up to 6 and lost a mark.

Question 1 (b) (i) asked for a visual check that might be used to monitor the labelling process for the can. Only the weakest students were unable to gain a mark for this question. Question 1 (b) (ii) was slightly more difficult but most students were able to comment on the fact that a thermoplastic adhesive would melt on the hot can and the label would not stick to the can. Question 1 (c) (iii) required students to outline one advantage in using a water-soluble adhesive for the label for the glass bottle and most students pointed out the ease of removal by soaking when the bottle would be recycled.

Question 1 (c) asked why the labelling process for the can is much more complex than for the bottle. This was a hard question and answered well only be the average and better students. The label needs to have the glue applied as the can is being labelled, is a much more messy process and requires much more accurate placing.

Turning over the page some new data was introduced. Question 1 (d) (i) asked students to calculate the total length of cardboard material required to form the internal separation for one case. That the internal separation comprises two long pieces and three shorter pieces of card was figured out by all but the weakest students. Similarly the diameter of the bottle at 70 cm was also figured out. However taking account of the 5 cm thickness of the cardboard was the discriminating part of this question. Average and better students were able to arrive at the correct answer. Question 1 (d) (ii) posed few problems. One mark was awarded for getting

the correct orientation, i.e. the slits at the bottom of the divider, and one mark for getting the right number of slits, i.e. two. Most students achieved 2 marks for this question.

One specific G2 comment suggested that in relation to Question 1 (e) (i) that the wording was not clear. Certainly many students found this question difficult and whilst better students seemed to realise that there were 12 bottles per case, some did not. Many students responded that the cost advantage was 16$ rather than multiplying by 12 to get 192$ as the cost advantage. Question 1 (e) (ii) asked students to list two advantages of distributing drinks in plastic bottles rather than glass. Very few students were unable to achieve 2 marks for this question.

Question 2 (a) required students to define thermal expansion. It posed unexpected problems as some students were unable to provide a reasonable definition. A design context where thermal expansion is important in question 2 (b) similarly posed problems. Some students answered this question very well with appropriate examples (e.g. oven doors, thermostats, railway lines and bridges) being frequently cited as appropriate examples.

Question 3 (a) required students to outline one reason for a manufacturer to evaluate a product prototype prior to going into volume production. On the whole this was answered well as was Question 3 (b) which asked for one strategy for evaluating the usability of a product.

Question 4 (a) required students to list two raw materials used to make glass. This was answered very badly by many students. Question 4 (b) requiring students to compare the effect of impact on toughened and laminated glass was answered reasonably well on the whole.

Question 5 (a) asked students to list two materials apart from paper, glass and steel that can be easily and economically recycled. Some students seem to go out of their way to find obscure and bizarre examples of materials as responses and make a reasonably easy question much more difficult than it needs to be. Question 5 (b) asked for one green design strategy and a product to which that strategy could be applied. Many students said recycling of glass bottles (perhaps after spending time wallowing in bottles). Several interesting examples were cited and the question was reasonably well tackled by students.

Question 6 (a) required a characteristic of an appropriate technology and question 6 (b) an explanation of how energy considerations may have influenced the design of a named consumer product. If students are asked to name a relevant consumer product then one mark is allocated for that. It was surprising how many students were unable to find a suitable response to this question.

Section B

The design context for Question 7 focused on a skateboard. Question 7 (a) (i) asked students to outline one mechanical property that would make a material suitable for skateboard manufacture. The question posed few problems for most candidates. Question 7 (a) (ii) went on to ask for an explanation of one disadvantage of producing a skateboard deck by lamination. This was answered well by most students attempting this question. Question 7 (b) (i) asked for one property of nylon that makes it suitable for injection moulding of the wheels of the skateboard. The question proved quite difficult for weaker students who clearly did not have much idea about what nylon was. Question 7 (b) (ii) about how one-off production contributes to the batch production of the trucks was relatively well answered.

Question 7 (c) (i) asked how standardized components contributes to green design strategies was extremely well answered by some students as was question 7 (c) (ii) about three implications (for designer, manufacturer and user) of using standardised components in the truck design.

The focus for Question 8 was an MP3-type music player. Question 8 (a) (i) asked students for one property of a thermoplastic that makes it suitable for injection moulding of the components of the MP3 player and was well answered by most students. Question 8 (a) (ii) asked an explanation of one economic reason which injection moulding is used and all but the weakest students were able to comment on high capital costs but low variable costs. Question 8 (b) (i) asked students to outline one aspect of the design of the MP3 which has been influenced by anthropometric considerations and 8 (b) (ii) for an aspect of the design which had been influenced by ergonomic considerations. It was not clear from many answers that students understood the difference between anthropometrics and ergonomics. Question 8 (c) (i) asked for the stage in its product life cycle that MP3 players as consumer products are currently at. The portable music market is very fast moving and this was quite difficult for students with some deciding that the answer was mature and others decline. A robust justification was awarded marks appropriately. Question 8 (c) (ii) asking for three product characteristics that the MP3 player needs to have to be considered consistent with sustainable development was poorly answered. As in all these questions requiring three by three marks it is organisation of the answer that helps students to score highly. Students who scribble some notes in pencil to organise their thought and use bullets under headings or a table to organise their answer invariably score better. Those that go into a stream of consciousness and just pour words onto the paper often repeat themselves and while they may have written considerable amounts, sometimes several pages, are not notching up marks. This is the reason for the Grade descriptor at Grade 7 commenting 'Communicated logically and concisely using appropriate terminology and conventions'. Student achieving Grade 7s are often (not always) noticeably more concise.

Question 9 focused on a refrigerator with a computer in the door. Question 9 (a) (i) asked students to list two considerations in the design of the refrigerator that would minimize its environmental impact on disposal. A fairly easy question with students generally achieving full marks. Question 9 (a) (ii) asked students to outline one stage in the product life cycle at which designing the refrigerator to use less energy will have the greatest benefit for the environment. The 24/7 nature of refrigerators during the utilization phase of the product life cycle was commented on by better students who achieved full marks. Question 9 (b) (i) asked why the refrigerator is an example of incremental design and seemed reasonably easy. Question 9 (b) (ii) asked for an explanation of one advantage of undertaking a user trial at the prototype stage and was answered well by many students. Question 9 (c) (i) asked for two lifestyle changes that this product would be likely to promote – at least one and often two changes were appropriately identified by most students. Question c (ii) asked for an explanation of three strategies that the designer could consider, to overcome early obsolescence of the computer and the body of the refrigerator. This was extremely well answered by some students. Weaker students with poorly organised answers repeated themselves and did not achieve the marks for the question. Organisation is an important skill and cannot be emphasised enough to students.

Higher level paper three

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 7	8 - 15	16 - 18	19 - 23	24 - 27	28 – 32	33 - 40

General comments

G2 forms were received from eight teachers. Six stated that the paper was of a similar standard to the previous year. All eight teachers suggested that the level of difficulty was appropriate. Four suggested that syllabus coverage was satisfactory and four said it was good. Four suggested that clarity of wording was satisfactory and four that it was good; and four teachers felt that the presentation of the paper was satisfactory and four that it was good.

Only one teacher made any general comments, and that was that it was a good paper that was suitably testing but if students had worked hard throughout the year then it was possible to answer.

The main difficulties for candidates appeared to be with examination technique and knowledge. The range of knowledge and understanding did vary from excellent to very poor. It was clear that some candidates had rote learnt definitions but had difficulty applying them to a context or did not realize that the answer required understanding with examples.

It appeared that for many candidates they had the ability to construct answers, but had not read the question adequately enough to develop an appropriate answer. The weak candidates appeared to be very ill-prepared for the examination; this was typically the case where candidates for the same school attempted different options.

It would be beneficial for all students to practice examination techniques, especially how to answer Question 5 in each option. Some students highlighted or underlined key elements of the questions, and these candidates seemed to do well. The marks allocated for each of the action verbs should be clear to candidates so they can structure answers appropriately.

Some candidates appear to structure their answers, particularly the Question 5's as an essay with an introduction and a conclusion. This generally does not gain them any marks, as marks are only awarded for the relevant points made.

The low take up of Options G and H continues and is being addressed in the new guide.

The strengths and weaknesses of the candidates in the treatment of individual questions

OPTION D – FOOD TECHNOLOGY

This option was not selected by a large number of candidates.

Question D1

(a) Most candidates made a successful attempt at this question for 2 marks, being able to list the two processes.

(b) Most candidates received at least one mark by listing an organoleptic property.

Question D2

The majority of candidates who answered this question did so successfully by listing the two types of nutrients.

Question D3

The majority of candidates who attempted this question did so successfully by stating the information and then making two points in an explanation.

Question D4

Candidates tended to either know both the categories of diseases or not know any, so received either 2 or 0 marks.

Question D5

Candidates who selected this option were able to name three issues regarding genetically modified foods, but not all were able to discuss two different points related to each issue. Those who structured their question with three headings tended to achieve more marks.

OPTION E – COMPUTER AIDED DESIGN AND MANUFACTURING

Question E1

(a) Most candidates understood generally how CAD and CNC work together and so got at least one mark, but few knew the specifics related to programmed instructions.

(b) The most common error in answering this question was that candidates listed some advantages rather than selecting one advantage and discussing it. A list in this case can only receive one mark, even though each listed advantage may be correct.

Question E2

The most common errors in answers to this question were the provision of a general answer rather than focussing on cutting, and listing some aspects rather than comparing on one aspect.

Question E3

Many candidates were able to describe the characteristics of JIT, but few could relate the role of a CNC machine to the JIT approach.

Question E4

This question was not answered well with few candidates able to describe the characteristics of fibre optics.

Question E5

This question was answered quite well. A number of candidates did not read the question carefully and discussed the advantages to the manufacturing companies.

OPTION F – INVENTION, INNOVATION AND DESIGN

This option continues to be by far the most popular selected by students.

Question F1

(a) Most candidates were able to list two aspects of the camera printer for two marks.

(b) Again, as is common in an "Explain" question worth three marks, a number of candidates listed three reasons rather than explaining ONE. A deeper response is required in this type of question, and candidates should be aware of that requirement. Some candidates seemed confused by the notion of the lone inventor.

Question F2

Many candidates received full marks for this question and were able to outline a benefit of being a pioneering manufacturer.

Question F3

The majority of candidates successfully described one way the printing process safeguarded the environment for two marks.

Question F4

Few candidates had an adequate enough understanding of 'design family' to enable them to apply the idea to the camera-printer.

Question F5

Not all candidates answered this question well, with many candidates focussing on a discussion of the internet. Candidates who structured their answer into three headings of two reasons and one disadvantage achieved high marks.

OPTION G – HEALTH BY DESIGN

Very few students selected to do this option, and those that did seemed not to have been taught the Option or had spent little time in preparation.

OPTION H – ELECTRONIC PRODUCTS

The very few candidates who attempted this Option performed poorly.

Standard level paper one

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 7	8 - 12	13 - 17	18 - 19	20 - 22	23 - 24	25 - 29

General comments

The average scores for SL Paper 1 are summarized in the table below.

Examination Session	SL P1 Mean score
May 2005	19.6
May 2006	21.7
May 2007	18.3

With the 85% increase in candidates in 2007 compared with 2006, the examining team considered the influence of the new schools on the mean scores, and was gratified to note that the mean score for the new schools was very close to the score of the schools who had done Design Technology SL before.

Ten G2 forms were received. One stated that this year's paper was of a similar standard to last year's, four thought it was a little more difficult and one that is was much more difficult. This perception is reflected in the mean scores. All ten felt that the level of difficulty was appropriate. Four thought the syllabus coverage was satisfactory and six that it was good, three that the clarity of wording was poor, two that it was satisfactory and five that it was good, and two that the presentation of the paper was satisfactory and eight that it was good. There were no specific comments made about the clarity of wording.

Two teachers made general comments about the exam in the G2's indicating that it was very straight forward, students had positive thoughts on the exam, there was an excellent spread across all topics in the core areas, and it was a well written and composed paper.

One teacher commented that Q8, about paper prototyping, was off the current syllabus (though it is included in the new guide). While this is true, the examining team felt that the nature of paper prototyping was adequately explained in Figure 1 and in the stem of the question, and represented a good example of students applying knowledge to a new context. The question was not really about paper prototyping, but about user research and user trial. The Difficulty Index for this question indicates students did not find it difficult.

A comment was made about Q 12 using phrasing that is not in the current syllabus: 'focus on aesthetics' and 'predictability of product cycle'. The examining team felt that these phrases did not require pre-learning in order to be comprehensible, and that the spirit of the question is reflected in the guide (AS2.3.10). The statistics indicate that most students did not find the question difficult. However the comment is appreciated as we need to maintain a focus on ensuring the language is accessible.

On Q 19, one teacher thought that PVC pipe is produced by both extrusion and injection moulding, so B and D could both be correct answers. While some candidates chose option B, the vast majority chose the correct answer, D. The illustration in Figure 3 indicates pipes which have a straight axis and consistent section, which would be produced by extrusion. Pipes that are curved, or have integrated flanges could be produced by injection moulding.

A concern was expressed about the fairness of Q 22. While recognizing that the idea of proportion is a difficult concept and the statistics indicate it is a difficult question, the examining team felt that the question represented ideas from Section 5.3 of the guide.

A teacher commented on the use of a case study for Q 26 - 30. This is a new aspect of Paper 1's, and is an attempt to provide a more interesting paper and also to provide a context to which students can apply their knowledge. The comment was made that this involved extra

reading, which would be OK if the students had reading time. The students do have reading time at the beginning of the examination, and for Paper 1 it is probably wise to suggest that they use this time to read the case study. The examination team appreciates this comment, and attempts will be made in future to minimize the amount of reading that students have to do in this section. In addition, a word count will be done on a number of papers to ensure that a case study does not significantly increase the number of words to be read.

It is interesting to note that, unlike some other subjects, there are very few blank answers on the Design Technology Paper 1's, indicating that candidates have enough time to complete the paper.

One teacher asked the question if the plastics coding and recycling system used in Q 27 falls within the scope of the syllabus. This question was drawn from AS 6.2.5, and similar questions have been used in past papers.

Two teachers had a concern about students accessing language, one mentioned Q 28. The examining team is not sure why this is the case, maybe the word 'ensure'. We will maintain a focus on ensuring that the language used is accessible.

The table below indicates in question order the difficulty index of each question. A lower difficulty index indicates a harder question. The * indicates the correct response and the values represent the number of candidates providing each individual response.

In addition, a discrimination index is also calculated. This compares the performance of the top 25% of candidates on a particular question with the top 25% of candidates overall and can vary between 0.00 and 1.00. With such a small candidacy the discrimination index is a less useful tool than it is in large entry subjects. Although the discrimination indices are not published as part of the subject report, all questions achieving a low or negative discrimination index are discussed at the grade award meeting.

Question	A	B	C	D	Difficulty Index
1	39	30	21	270*	75
2	265*	65	20	10	73.61
3	92	8	21	238*	66.11
4	4	68	155	133*	36.94
5	230*	2	104	24	63.89
6	39	43	217*	61	60.28
7	53	228*	37	42	63.33
8	246*	62	20	32	68.33
9	12	266*	64	18	73.89
10	72	274*	7	7	76.11
11	38	93	145	84*	23.33
12	74	268*	9	9	74.44
13	320*	9	29	2	88.89
14	44	292*	18	6	81.11
15	49	17	273*	21	75.83
16	15	191*	39	113	53.06
17	29	12	167*	152	46.39
18	9	14	328*	9	91.11
19	2	86	9	262*	72.78
20	53	268*	14	24	74.44

21	183*	29	32	116	50.83
22	127	36	56*	141	15.56
23	36	28	231*	64	64.17
24	16	21	92	231*	64.17
25	9	38	106	207	0
26	82	67	154*	56	42.78
27	10	203	2	145*	40.28
28	219*	39	72	30	60.83
29	133*	26	55	145	36.94
30	27	8	11	312*	86.67

The examining team analysed the statistics on all the questions, and those questions where a significant number of candidates selected an incorrect option were more closely scrutinized. Some of these have been mentioned above, the remainder are discussed below.

The confusion that is evident in Q 11 seems to be because of a lack of understanding of percentiles. A percentile range is 'the proportion of a population at or less than a given value', so by considering those up to the 5th percentile would be considering those who have a short reach envelope thus ensuring maximum numbers would be able to reach the items within the workspace.

Q 25 had a negative discrimination index with the majority of students selecting option D. Analysis of the question led the examining team to accept that both C and D are correct responses, so this question was eliminated from the analysis.

Standard level paper two

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0-6	7-12	13-16	17-21	22-26	27-31	32-40

General comments

Paper 2 is divided into two sections: Section A and Section B. Section A is worth 20 marks and comprises three questions – a data-based question (question 1) worth 12 marks and two questions worth 4 marks each to provide syllabus coverage. Students are required to answer all three questions in Section A. Section B comprises three questions each worth 20 marks, of which students are required to answer one question. Each question in Section B comprises three parts with each part divided into two or three sub-sections. The questions are contextualized by the provision of stimulus material – generally a photograph reflecting a particular design scenario and the questions posed explore different aspects of the design scenario to provide syllabus coverage. Through the paper the examining team tries to ensure that evidence will be available to enable the determination of the grade boundaries through the application of the Group 4 Grade Descriptors.

Of the nine G2s received for this paper, five were from schools who had taken this subject in previous sessions. Four commented that the paper was of a similar standard to the previous year and one suggested it was a little more difficult. All nine G2s said the paper was an appropriate level of difficulty, that the paper was either satisfactory (5) or good syllabus coverage (4), that the clarity of wording was satisfactory (3) or good (6) and that the presentation of the paper was satisfactory (3) or good (6). One G2 commented that the exam was 'Very straightforward. Students had positive thoughts on the exam. I agree'. This is really helpful and encouraging. Please do send in G2s to feedback positively as well as negatively. Another G2 commented that question c (ii) for all Section B questions related to manufacturing processes and production. This was deliberate and done to ensure parity across the papers – the questions relate to different materials and processes. The paper should give appropriate coverage of the core material and there are no sections that students can afford not to study hoping that they will not have to answer a question on them. Hopefully between what is in Section B and the two syllabus covering questions in Section A there will be an appropriate slice through the syllabus for students.

The strengths and weaknesses of the candidates in the treatment of individual questions

Section A

Again it is probably worth reminding teachers that the point of Question 1 is that it is to provide the opportunity for students to demonstrate data analysis and problem-solving skills and should be something that is off syllabus and providing an unfamiliar context for the demonstration of these skills. Most of the average and above average students coped well with the question and there were no obvious problems.

Question 1 (a) (i) required students to calculate the scale at which the signs are drawn. This was supposed to be a straightforward question although some weak students would not agree with this evaluation! Question 1 (a) (ii) required students to identify the minimum size ISO paper on which the poster could be printed in landscape mode. This was answered well on the whole with students annotating Figure 2 in pencil as they brought together the data to make their decision on the right ISO paper size.

Question 1 (b) (i) asked students to state one advantage of using computer-aided design to develop ideas and was answered extremely well on the whole. In contrast question 1 (b) (ii) was more challenging and answered well by a smaller number of students.

Question 1 (c) (i) asked student to state one disadvantage of the sign in Figure 3 over the one in Figure 2. Most students pointed correctly to the text in English. Question (c) (ii) asked for an explanation of why international standards for the shape and colour of road signs had been developed. Three mark questions requiring more depth and organization are often answered poorly by all but the stronger candidates and this question was no exception. Scribbling in pencil to organize thoughts before answering properly does seem to help students to marshal their thoughts coherently and this is rewarded by the achievement of higher marks. In developing examination technique and preparing students for the examination challenge this is an important point for teachers to emphasize with students.

Question 2 (a) required students to define green design. This was supposed to be very easy although for some (weak) students this did not prove to be the case. Question 2 (b) asked students to discuss why some manufacturing companies have adopted pro-active approaches to their environmental policies. The question is straight off the assessment statements in the Guide but was not answered well by a lot of students. Issues related to the organizing of answers stymied some students.

Question 3 (a) required students to define planned obsolescence. This was answered very badly with students clearly not sure what planned obsolescence is all about. Eco-labelling similarly was a mystery to some students. It is surprising how many students did not attempt this question at all.

Section B

The examining team tries to pick design contexts that are accessible to frame a series of questions that cut across the syllabus. The age of the candidates, their likely experiences and the international context are all taken into account in assessing the accessibility of design contexts. We try to pick questions which require specific answers rather than ones that students can answer 'environment' or 'green' or 'recycling' and get a mark. We aim to make a paper that discriminated between stronger and weaker candidates. We try to get evidence to enable to us to use the Group 4 Grade Descriptors to grade the scripts in the Grade Award meeting. Well organized, logically structured answers invariable achieve higher marks. This is a skill which teachers should emphasize in preparing students for examinations.

The design context for Question 4 focused on a child's craft produced rocking horse. Question 4 (a) (i) asked students to state one feature of the rocking horse that makes it suitable for craft production. The question posed few problems for most candidates. Question 4 (a) (ii) asked students to list two advantages of using freehand drawings to communicate ideas. The question was generally answered well. Question 4 (a) (iii) asked for one criterion that would be used to evaluate the rocking horse to ensure that it is safe to use. Again the question was answered well on the whole. Question 4 (b) (i) asked for a list of two mechanical properties that make wood a suitable material for the rocking horse. Most students selected hardness and stiffness as responses. Question 4 (b) (ii) asking for an outline of one advantage of using laminated timber rather than single pieces of timber for the production of the rockers was answered well by average and better students. Weak students seem to think that lamination is about putting a plastic covering on a piece of card of paper and get thrown by questions on lamination in the context of the Guide which is about building up a thicker material from layers of thinner materials using adhesive. The strength of the resultant material, its cost and it ability to be shaped using a mould if necessary was pointed out by many students. Question 4 (c) (i) asked students to outline one way in which craft production can be considered a clean technology and many answers focused on low energy utilization or low/no waste as reasons. Question 4 (c) (ii) about three different manufacturing processes contributing to the production of the rocking horse was answered really well by some students who developed well organised responses to the question going into appropriate depth to achieve the full nine marks available.

The design context for Question 5 focused on a tent for hikers. Question 5 (a) (i) asked students to define brainstorming and was answered well on the whole. Question 5 (a) (ii) asked students to outline one way in which brainstorming with a group of experiences hikers

could contribute to the incremental design of the tent. The question was generally answered well with some of the better students mentioning the term constructive discontent. This was not required by the mark scheme but is an example of where better students – Grade 6 and 7 students – are able to use appropriate terminology to express their answers. Question 5 (a) (iii) asked for a list of two ways in which mathematical modelling might be used in the design of the tent. This was appallingly badly answered by a number of students. Question 5 (b) (i) asked for an outline of one mechanical property relevant to the selection of the material for the metal hoop used to support the tent and was answered well by about half of the students. Similarly question 5 (b) (ii) asking for an outline of one mechanical property relevant to the selection of material for the guy lines for the tent was answered well by about half the students. Question 5 (c) (i) asked students to outline one advantage if using CAD/CAM in the production of the tent. Many students suggested correctly that speed of redesign and accuracy of production were advantages of CAD/CAM and achieved both marks by following the reason with a brief explanation. Question 5 (c) (ii) about three different manufacturing processes contributing to the production of the tent was again answered really well by some students who developed well organised responses to the question going into appropriate depth to achieve the full nine marks available. Some students provided woolly, badly organised answers with lots of irrelevant and repetitive material and scored poorly. Teachers would be well advised to read the Group 4 Grade Descriptors to read about the characteristics of weaker and stronger performance. The Grade Descriptors are used in determining the grade boundaries for the paper at the Grade Award meeting.

The design context for Question 6 focused on a modular system used to produce a guttering system for a house. Question 6 (a) (i) asked students to list two advantages of using an exploded isometric drawing to communicate aspects of the guttering system to potential clients The question was answered well by all but the weakest students. Question 6 (a) (ii) asked students to explain how fixed costs contribute to the final cost of the components for the guttering system. Some excellent answers - how fixed costs are totalled and divided by the breakeven number determined by the manufacturer and added to the variable costs - contrasted with some answers from weak students which made examiners wonder if the students had studied the syllabus laid out in the Guide. Question 6 (b) (i) asked for an outline of one mechanical property that determines the spacing of the guttering support brackets in the guttering system and was answered correctly by about half the students attempting the question. Question 6 (b) (ii) about why the component labelled A could not be manufactured by extrusion was similarly well answered. Question 6 (c) (i) asking why using thermoplastic for the guttering system meets the design objectives of green products brought out an array of correct answers. Finally, question 6 (c) (ii) about three different manufacturing processes contributing to the production of the rocking horse was answered really well by those students who developed well organised responses to the question going into appropriate depth to achieve the full nine marks available.

Standard level paper three

Component grade boundaries

Grade:	1	2	3	4	5	6	7

Mark range:	0 - 4	5 - 9	10 - 12	13 - 16	17 - 19	20 - 23	24 - 30

General comments

Again the format for each of the Paper 3 options is that question 1 is a data based question providing stimulus and context in the form of a table, photograph, flow chart, etc. The last question in each option is an extended response question worth 6 marks to provide a better opportunity for candidates to demonstrate their understanding. It is through this question and its extended response that the more able candidates demonstrate their ability and weak candidates can be better discriminated from stronger candidates. It is important to reinforce with students that a question worth 6 marks is generally looking for 6 specific points in the answer, and that these can be presented as a list of points, and does not need to be structured as an essay. The examining team often notes candidates who waste time unnecessarily structuring their answer with an introduction and conclusion. The indicative space for answering the questions does not assume an introduction and conclusion. Often two main points are required in the answer, and then these are elaborated on by making two more points about each, for a total of 3 + 3 = 6 marks. Candidates should structure their answer clearly according to this formula.

Six G2 forms were received and all stated that the paper was of a similar standard to last year. All six felt that the level of difficulty was appropriate. Three stated that the syllabus coverage was satisfactory and three that it was good, three that the clarity of wording was satisfactory and three that it was good, and three that the presentation of the paper was satisfactory and three that it was good.

No teachers made any general comments on the paper. One G2 made a comment that in Option A, QA1b, 'laminated construction' was not mentioned in the syllabus details. It is mentioned in AS4.2.5 – 4.2.8, and the majority of students answered the question well.

A comment on the OCC discussion forum related to the perceived difficulty of Option B Q3, which was about gold and alloying, because gold was not mentioned in the syllabus. The assumption by the examiners was that students would know that gold is a metal, and the question is about the effect of alloying, not on specific characteristics of gold itself. So it should not be a disadvantage to students if they have not been taught about gold specifically.

In popularity order the options are ranked: F, E, C, D, G, A, B and H. In the majority of schools, most candidates from the same school attempted the same option. In some schools however, candidates selected different options, maybe suggesting that some candidates are tempted to answer options that they have clearly not been taught and this obviously impacts on their performance. It is also possible that in some schools candidates may be left to prepare for their options individually; an approach which also generally leads to poor outcomes.

As in the past, the main difficulties for candidates appeared to be with examination technique and knowledge. The range of knowledge and understanding varied from excellent to very poor. It was clear that some candidates had rote learnt definitions but had difficulty applying them to a context or did not realize that the answer required understanding with examples.

It appeared that for many candidates they had the ability to construct answers, but had not read the question adequately enough to develop an appropriate answer. The weak

candidates appeared to be very ill-prepared for the examination; this was typically the case where candidates for the same school attempted different options.

It would be beneficial for all students to practice examination techniques, especially how to answer Question 4 in each option. Some students highlighted or underlined key elements of the questions, and these candidates seemed to do well. The marks allocated for each of the action verbs should be clear to candidates so they can structure answers appropriately.

The strengths and weaknesses of the candidates in the treatment of individual questions

OPTION A – RAW MATERIAL TO FINAL PRODUCT

Few candidates attempted this option.

Question A1

(a) Candidates answering this question tended to get one mark for stating the characteristic as hard/tough/strong, fewer got the second mark for being able to elaborate and apply their idea to the skateboard.

(b) Many candidates described lamination rather than applying that knowledge to the skateboard context.

Question A2

Candidate tended to either receive 2 full marks or 0 marks for this question, many describing the benefits to the skater rather than the characteristics of nylon.

Question A3

Most candidates received at least one mark for their answer to this question which was most typically related to rust, although some thought that stainless steel resisted rust because it was coated.

Question A4

This question was not well answered with little understanding of the glass recycling process indicated. The answer from many candidates did not reflect their understanding of the 2 x 3 structure required in the answer. Some students underlined their six main points and these students seemed to do well.

OPTION B – MICROSTRUCTURES AND MACROSTRUCTURES

The very few candidates who attempted this option indicated a very general level of knowledge with very few technical details and very little in depth understanding.

OPTION C – APPROPRIATE TECHNOLOGIES

Question C1

(a) Most students achieved one mark for showing an understanding of alternative technology, but were unable to apply that to the pedal-powered drill.

(b) Many candidates found this question difficult, and few received all 3 marks. Many understood appropriate technology, but were not able to describe a context, which was the main point in the question.

Question C2

Most candidates received full marks for describing why pedal power is a form of renewable energy, though some failed to acknowledge that humans need an energy source.

Question C3

Most candidates achieved one mark, but tended to list two rather than outline one method a manufacturer could use. Some candidates related their answer to pedal power rather than sustainable development generally.

Question C4

Generally this question was well answered, with many candidates seeming to structure their answer of three points for each of two barriers.

OPTION D – FOOD TECHNOLOGY

This option was undertaken by very few candidates.

Question D1

(a) Most candidates made a successful attempt at this question for 2 marks, being able to list the two processes.

(b) Most candidates received at least one by listing an organoleptic property.

Question D2

The majority of candidates who answered this question did so successfully by listing the two nutrients.

Question D3

The majority of candidates who attempted this question did so successfully.

Question D4

Most candidates received reasonable marks for this question, being able to relate the characteristics of bread to a balanced diet.

OPTION E – COMPUTER AIDED DESIGN AND MANUFACTURING

Question E1

(a) Most candidates understood generally how CAD and CNC work together and so got at least one mark, but few knew the specifics related to programmed instructions.

(b) The most common error in answering this question was that candidates listed some advantages rather than selecting one advantage and discussing it. A list in this case can only receive one mark, even though each listed advantage may be correct.

Question E2

The most common errors in answers to this question were the provision of a general answer rather than focussing on cutting, and listing some aspects rather than comparing on one aspect.

Question E3

Many candidates were able to describe the characteristics of JIT, but few could relate the role of a CNC machine to the JIT approach.

Question E4

Many candidates spent time in answering this question by defining mass customization, for which they received no marks. Others gave more than two changes but provided little discussion of the changes.

OPTION F – INVENTION, INNOVATION AND DESIGN

This option continues to be by far the most popular selected by students.

Question F1

(a) Most candidates were able to list two aspects of the camera printer for two marks.

(b) Again, as is common in an "Explain" question worth three marks, a number of candidates listed three reasons rather than explaining ONE. A deeper response is required in this type of question, and candidates should be aware of that requirement. Some candidates seemed confused by the notion of the lone inventor.

Question F2

Many candidates received full marks for this question and were able to outline a benefit of being a pioneering manufacturer.

Question F3

The majority of candidates successfully described one way the printing process safeguarded the environment for two marks.

Question F4

Many candidates were aware of the developments that were important in the development of the bicycle; those that did not achieve full marks were unable to organize their answer to reveal six clear points.

OPTION G – HEALTH BY DESIGN

Very few students selected to do this option, and those that did seemed not to have been taught the Option or had spent little time in preparation.

OPTION H – ELECTRONIC PRODUCTS

The very few candidates who attempted this Option performed poorly.

Conclusion

As is often the case, many candidates could quite easily achieve more marks by developing their examination skills. A good understanding of the action verbs (e.g. state, outline, describe, explain) and their value is vital so that candidates recognise the significance of the mark weighting in relation to the expectations of the answer.

Good candidates took the advice from previous reports using headings and bullet points in their answers, but this practice is still not widespread. Many candidates still structure their answer as an essay, by repeating the questions in an introduction and then summarizing their answer in a conclusion. Other candidates who underlined or highlighted key phrases in the questions seemed to do well.

Teachers should continue to stress this to candidates and encourage candidates to confirm their understanding of the extent of the answer required by checking the mark allocation for the question, and ensuring that a matching number of points are identifiable in the answer. Answers from better candidates were more succinct and used appropriate terminology.

Care in reading the questions should be emphasized, in order for the required information to apply to the context provided rather than just repeated. Candidates repeat a definition when it is the application of the definition that is sought.

The answering of the last question in the Options proves to be the most difficult for many. The answer pattern is generally a variation on 2x3 or 3x3 for six or nine marks. Candidates should be encouraged to use headings, bullets or blank lines to divide their answer up into the required number of sections.

Candidates should be encouraged to use the indicative spaces provided for their answer. It is not essays that are required, as some candidates structure their answers with introductions and conclusions for which they receive no marks and which consume time and space.

Teachers should continue to familiarise themselves with the Group 4 Grade Descriptors. The examining team continues to strive to:

- ensure appropriate syllabus coverage;
- use accessible design contexts understandable around the globe;
- ensure parity between optional questions;
- make the expression of questions as straightforward as possible (particularly for second language candidates);
- ensure that the various examination elements discriminate appropriately between stronger and weaker candidates;
- Ensure that there are opportunities for candidates to provide evidence for the different aspects of the Group 4 Grade Descriptors within the examination papers to enable the Grade Descriptors to be used in the setting of the grade boundaries at the Grade Award meeting.