RECOGNISING ACHIEVEMENT

GCE

Design & Technology

Advanced GCE **A2 H453**

Advanced Subsidiary GCE **AS H053**

OCR Report to Centres

January 2012

HX53/R/12J

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, OCR Nationals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

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This report on the examination provides information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the specification content, of the operation of the scheme of assessment and of the application of assessment criteria.

Reports should be read in conjunction with the published question papers and mark schemes for the examination.

OCR will not enter into any discussion or correspondence in connection with this report.

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OCR REPORT TO CENTRES

Overview

This was the second full January assessment session for the new GCE Design & Technology: Product Design specification. Candidates were entered for all four units.

Although the four Units are distinct and different, they are designed to complement each other as supportive and preparatory elements in the development of the skills, knowledge and understanding required in Product Design. There is further evidence in this January session that skills and abilities are being transferred across the units. Work in units F522 Product Study and F524/02 Product Design Component 2 show an increasing number of examples of exciting and innovative exploration and modelling of ideas.

Performance on unit F521: The Advanced Innovation Challenge was marginally better than last January, particularly on F521/02. There were a large number of candidates re-sitting this exam. Centres appear to be familiar with the examining routine and candidates are expanding their range of design thinking. It is important that when preparing candidates for this examination, techniques are employed to allow candidates to present ideas quickly and to familiarise themselves with the workbook and the time allocation for each section.

This unit encourages innovative and creative thinking, candidates should not try to predict the challenge and include pre-prepared work, such as specifications, in their job bag.

Centres are reminded to ensure that photographs show clearly the features and qualities of the design models.

Some exceptional work was presented for assessment for the Product Study Unit F522. It is encouraging that increasing numbers of candidates are submitting work as e-portfolios for this Unit. Candidates make good use of digital technologies to record the development of their work in ‘real-time’ and show effective evidence of interactive dialogue.

It is important that when candidates re-submit work, clear guidance is given as to where the modifications/additions have been made. Some centres made very good use of on screen annotation or ‘post it’ notes on appropriate pages in folders.

Centres are reminded that when submitting e-portfolios for F522: Product Study and F523: Design, Make and Evaluate, care should be taken to ensure that video clips are appropriate in terms of value to the project and that the presentations run correctly before packaging them. The majority of responses to F524/01 and F524/02 were for Resistant Materials with significant numbers attempting the Graphics Products and Manufacturing questions.

The overall standard on both papers was good, although in some cases, candidates attempted a question that they were obviously not prepared for. Some candidates attempted the Built Environment and Construction question in F524/01 or F524/02 with very little understanding of the specialist material and constructional detail required to achieve the full range of marks. Some candidates answer more than one question in F524/01. This is to be discouraged as it reduces the time available for F524/02 and the response to F524/01 is generally limited and lacking detail.

The following reports contain detailed breakdowns of general candidate performance of the January 2012 assessment session. They also include very valuable guidance and tips on how to access the full range of marks available.

It is helpful if the reports are read in conjunction with the full specification and appropriate mark schemes.

F521 Advanced Innovation Challenge

General Comments

Administration

It is important that both examination papers are dispatched to the appointed examiner in one package as soon as the reflection paper has been completed on the date set by OCR. Candidates will have access to their challenge work booklets during session 2; however they are not to write in it.

Answers must be completed in the challenge booklet and realisation booklet, there is additional space in the booklet should candidates require it; however, the use of this space should be labelled carefully with the box number that the work relates to. Additional supplementary sheets should be avoided if possible and additional paper of any kind should not be stuck into the booklet. Where 'non examination board' paper is stuck into the booklet it will not be marked. The front of the paper indicates that additional paper will not be marked.

All materials relating to examinations sent from OCR to centres will be dispatched to the examinations officer. It is important that colleagues check with the examinations officer that they have received all relevant and most up to date information prior to starting the challenge activity. Examination notices must be displayed in the area where the examination is to take place and an invigilator should be present. The teacher is there to read the instructions.

Running the Challenge

Centres are reminded that the role of the teacher is that of a facilitator and not that of a normal classroom teacher. They are there to provide access to modelling materials, monitor health and safety issues and read the teacher script to candidates, elaborating and explaining where this is indicated. Teachers must not:

- give advice to students about the design or manufacture of their product;
- cut materials to the correct shape or dimension for students.

It must be made clear to all candidates that this is an examination to assess the individual student's designing and modelling capability.

A number of students continue to approach the challenge with pre-conceived ideas and have failed to respond directly and creatively to the design challenges. A few candidates misinterpret challenges, either because they do not read them with sufficient care or because they choose to base their work on practiced work to a design challenge. The themes for the examination deliberately give little opportunity to prepare specification points or ideas in advance of the examination to prevent over-preparation of candidates. Each challenge has two specific key areas that candidates will need to address fully with fresh innovative thinking to respond to the challenge.

It is the centres responsibility to provide a suitable range of modelling materials for candidates. It is not advisable for candidates to bring their own materials for modelling as this will hamper design thinking.

A 'job bag' should contain inspirational materials, images and information about materials, anthropometrics that could be useful when designing. Candidates must not share resources or job bags during this examination.

The quality of photographs is generally good but examiners have reported some problems with the photographs presented for assessment. These problems include; failing to focus on the object, photographs being printed at a size too large for the allocated positions within the workbook. Photographs must be stuck into the correct boxes in the booklet. It is important that the centre provides colour images of a good quality

Centres are reminded that three photographs is the minimum required. Additional photos can be added to the workbook. This is particularly important if it is necessary to show other parts or views of an artefact or mechanisms to fully illustrate the final outcome. Extra photographs can be included in the evaluation or progress report boxes.

It is recommended that if candidates wish to annotate photographs, that a second print is produced and stuck into either the appropriate section of the workbook or into the 'additional space' and clearly labelled and then annotated. Candidates should be encouraged to stick photographs into the workbook as they are printed.

Security of Workbooks

Centres are reminded of the importance of appropriate security of all workbooks between the three sessions of the Innovation Challenge.

Work of Candidates

Again some highly creative work has been seen this session from candidates who have shown both design flair and sound technical knowledge. A significant part of the preparation for the exam should include techniques to allow the candidates to present ideas quickly and practice of workbook completion under timed conditions. Examiners are aware of the pressure on candidates in this examination and marks are awarded with this in mind.

Areas such as specification, evaluation of ideas and final products and the realisation continue to discriminate well between candidates. They are testing higher order thinking skills and these areas should be taught throughout the AS course.

In some centres, candidates responded to F521/01 in a formulaic way – students seemed to have been taught what to write/do in each box but unfortunately are not independent enough to respond directly to the challenge. Pre-prepared work taken in as part of the job bag such as specifications and mind maps can result in candidates producing generic work that will not achieve high marks.

The Challenge Assignment

Initial Thoughts

Candidates used a combination of text and drawings to explore the challenges within the theme of 'annual events' and identified possible design areas/problems. Some candidates failed to think creatively about the challenge or context and suggested only very predictable responses. Many candidates failed to consider the challenges of designing a product for an annual event. Candidates need to be encouraged to explore the chosen challenge widely, take risks and think creatively. Many candidates explored ideas in depth; thinking creatively, whilst considering the indoor or outdoor environment, users and space they were designing for. A number of candidates did not fully engage with the challenges set, missing one or both of the two key points and so lost marks in this first section.

Design Brief

Candidates should be encouraged to write clear and precise design briefs that develop the design challenge further and offer scope for creativity. The majority of candidates identified the appropriate user groups for their products. The best design briefs expanded upon the design challenge clearly adding users and extra market information in them.

Specification

The more successful responses are where candidates concentrate their thinking on the functional and user needs of the product in the design situation and ensure that the relevance of all points are explained. Generic specification points cannot be awarded marks, unfortunately a significant number of candidates continue to produce specification points that are generic. Some candidates disadvantaged themselves by using acronym methods eg ACCESSFM which often leads to generic points. Candidates should be advised to focus on functional aspects when writing a specification. Specific detail is required for high marks in this section, eg weight, size and material properties

Ideas

Initial ideas on the whole were creative, with some excellent examples of innovative thinking, and good use of annotation and sketching. Higher performing candidates produced a range of functionally different ideas that clearly related to their specification, situation and the potential users. Originality and creativity are key aspects of this criterion. It was encouraging that fewer candidates just presented one idea in this section compared to previous sessions.

Candidates used a combination of drawings, text, annotation and occasionally modelling/photographs to show their ideas. Higher performing candidates gave different views of objects or parts of objects and clearly communicated their creative design thinking and included specific detail of materials and manufacture/constructional techniques. This is an area that still needs developing, many candidates do not include details of specific materials and manufacturing techniques that could be used for the product.

An improvement was seen in this session for the evaluation section with good evaluative annotation in the designing section. Where evaluations were poor, candidates had not explained why they took the idea forward and why others were rejected. Quite often simply strengths of ideas are discussed with no mention of disadvantages.

Reference to source of inspiration/job bag was usually given although not always with pictures. The better examples of evidence from job bags were where candidates had collected a very broad range of items and took their inspiration from unrelated inspirational objects. Candidates should be advised against copying or presenting existing solutions as their own ideas. Examiners saw a lot of very similar or totally copied benches and chairs/tables presented for challenge two.

Many candidates had a clear structure to present their feedback in box 10 showing comments/ response/modifications. Clearly this is something that is influenced by practice in individual centres and it is something that some centres could easily work on to improve the work of their candidates.

Development of Ideas

There has been some improvement in this section, most candidates use notes or annotations to show how they are developing and improving their design towards an optimum solution that satisfies the design brief, specification and needs of the user. Candidates are also expected to show consideration of materials and components and to consider methods of manufacture for their product. Most candidates are able to suggest materials for construction, however generic terms such as 'wood', 'plastic' or 'card' should be avoided. It should be remembered that in this section the materials and construction are those that would be used for the product should it be manufactured commercially and not those that would be used in the workshop or for the model making.

It is also expected in this section that the size of the product is considered. Dimensions of individual features, components and/or thicknesses of materials are considered by the more able candidates.

Candidates should be advised against modelling extensively at this stage of the challenge. Usually this is not successful because there is insufficient time in which to consider the practicalities of the real product.

Plan for Modelling

Action plans were good with lists of materials and action plans ranging from basic statements to ones that included time schedules/flow charts and annotated sketches of how model would be constructed.

Recording Progress and Modelling

Some candidates give only brief statements in their progress reports with no real detail to show examiners what modifications/amendments or successes have been made. Those who have used extra photos or sketches of details of their models tend to complete these boxes more successfully. Candidates that provide little more than a cursory description of what they have done in the modelling are unable to reach the top band of marks for the progress report – reflection of modelling should illustrate with sketches/photos technical problems they have encountered and highlight how they have overcome these.

Most centres have a better understanding of the type of models required although many candidates concentrate exclusively on the aesthetics of their design ignoring any functional detail (eg folding mechanisms). There were some excellent examples of models – the main point here is for candidates to use appropriate modelling materials to enable them to fully reflect their design. Candidates need to be able to develop their quicker modelling skills using a variety of materials. Creative use of common inexpensive materials is probably the easiest way for candidates to score well in this section. Kits should not be used for final models as it restricts the candidate's ability to model their design accurately and skilfully; as does the use of existing products to form part of, or most of their model. The use of collected materials should also be avoided (loo rolls, cereal boxes, plastic bottles). The use of skills section cannot be highly marked if candidates have just stuck together collected items to form a model.

Evaluation

Some improvement was seen this session for the evaluation section. There is evidence of centres instructing candidates to structure the section as 'S and W', 'Evaluation' and 'Modifications'. This is usually a successful approach. However, many candidates fail to record their further modifications in sufficient detail and some don't indicate any possible weaknesses of their product. A very small number of candidates just talked about their model and not the product so failed to score any marks.

Comments on Individual Challenges

Generally the most popular question was the seating and eating area, challenge two. The promotional product, system to exhibit work and protective product, challenges three, four and six were also popular with all questions allowing scope for creativity.

Challenge One:
A product to promote healthy lifestyle. This question was quite popular; there were a wide range of approaches from exercise products to interactive displays/games. Some innovative responses were seen.

Challenge Two:
Seating and eating area for families. A very popular choice of challenge. Often little or no reference was made to the annual event – folding seat/picnic tables very similar to those seen in previous challenges. However, there was generally a varied response with some highly creative successful responses.

Challenge Three:
Promotional product for a music and fashion event. This question was quite popular. Some creative responses were seen with good consideration of the music and fashion event and the need to flat pack/post a low cost product.

Challenge Four:
A system to display art work, fashion and sculpture. A fairly popular choice of challenge. Some highly innovative responses were seen that showed good consideration of the problem and need to store the product after the event.

Challenge Five:
A system to help a performance to be seen by all. This wasn't a very popular choice of challenge. Some candidates missed the key aspect of the system or product being suitable for a variety of performances and venues; producing designs for permanent stadiums.

Challenge Six:
A protective product to be worn in the event of extreme weather, some creative responses were seen for this, the better candidates considered all types of extreme weather.

Reflection Paper

Candidates found this a more accessible paper than recent sessions with more candidates focusing on the product they had designed.

It was pleasing to see more candidates producing more focussed responses and addressing the bullet points; accessing the full mark range available. It is evident that the more successful candidates are planning their answers ensuring all bullet points are addressed in relation to the topic of the question. Not all candidates support the points fully with specific examples in reference to their product.

It should be noted that it is stated in the specification; “candidates have the opportunity to reflect on the challenge by answering questions that require them to consider their product. These will be derived from a design, manufacturing or marketing perspective, including: sustainability and the environment; product life; social, moral and cultural issues; environmental issues; inclusive design; the human interface; aesthetics; scale of production; production technologies; fashion; marketing; commercial issues.” These areas should be taught through the ‘AS’ course, and students should learn to apply knowledge to products when evaluating and analysing. Candidates should be familiar with technical terms related to these topics.

Question 1

This question was answered very well by some candidates, who clearly showed a good understanding of inclusive design. They gave realistic improvements to make their products more inclusive often to the elderly, children or disabled users. This was then backed up with clear details of how the modifications would be manufactured.

A significant minority of candidates did not understand the term ‘inclusive design’ and latched onto the phrase ‘appeal to wider market’ to explain changes to aesthetics etc to make their product more successful. Others talked about ergonomic changes to make the product more comfortable with no clear reference to inclusivity. Some candidates seemed to have a lack of understanding of the needs of disabled users and gave generalised statements, without specific reference to a particular disability. A few candidates just gave general improvements to their designs that did not relate to the question at all.

Question 2

This question generally performed better than Q1, the majority of candidates had a clear understanding of environmental issues and sustainability. Candidates that performed best discussed the different stages of the life cycle analysis and clear improvements to make their product more sustainable.

All candidates had some understanding of sustainability. The majority made some reference to product life cycle, which showed an understanding of the term but very little direct application to the product they had designed. A number of candidates talked about the 'products life' – growth to maturity to decline etc and had misunderstood the need to discuss the effects on the environment and the products 'life cycle analysis'.

The third bullet point could usually be awarded a mark because of reference to logos/marketing that could be applied to the product.

Some students boosted their marks with this paper, by addressing the bullet points fully and relating to their product.

F522 Product Study (Coursework)

General Comments

This session all moderators reported that projects were submitted in good time with appropriate documentation. The use of the downloaded interactive CSF form is to be encouraged as it adds up all of the section marks and gives a total thus avoiding arithmetical errors.

Most, but not all, entries in the January session are re-submissions from June 2011. Moderators appreciated the efforts of some centres to highlight additional work undertaken either by 'post it' stickers or on screen annotation.

OCR is encouraging the use of e-portfolios as they facilitate the use of real time digital images and 'interactive dialogue' in key sections of the study. It is acceptable to continue to use A3 portfolios and OCR appreciates that logistical implications do prevent some centres from submitting work on CD. Many re-submissions this session were paper A3 portfolios. In these circumstances it is absolutely essential for centres and candidates to appreciate that paper folios must include real time digital images of products and prototypes and crucially 'interactive dialogue' which can be interpreted as discussing products, prototype development, ongoing evaluation and testing with others and reacting to suggestions made in real time – not retrospectively. Those submitting on CD can include photographs/videos and sound bites, candidates submitting A3 must meet the same assessment criteria by other means. The most successful centres took real time photographs of interaction taking place and reproduced the actual comments of those interacting in real time in their own works recorded by them. It is worth emphasising again that retrospective comments (which are typically retyped) are not acceptable in this respect.

It was evident from some re-submissions this session that a small number of candidates had transferred their work from an A3 format to CD but had omitted to scan in ideas sheets and annotated sketching. Centres awarded marks where there was complete absence of any evidence. In these circumstances moderated marks this session could be substantially below the June marks.

The key message for Product Study success is to utilise the best features of both modes of presentation – to combine real time digital images and first hand interactive dialogue with, free flowing ideas sheets which demonstrate a wide range of creative, innovative ideas presented through high quality annotated sketching. Those who achieve this can access the top band of marks whether they submit using A3 paper or CD. Centres should note it is not possible for a candidate to submit both a folder and a CD.

OCR requires that all PowerPoint files are capable of being opened in PP2003 and centres are required to save in this mode. In practice PP2007 gives very few problems as file converters enable files to be read. Centres should however note that PP2010 causes considerable problems if not formatted properly.

Section by section guidance on Product Study requirements for Unit F522

These comments are common to most sessions and are added to when moderators raise additional issues for attention.

This product study should take candidates 30 hours to earn up to 120 marks.
1 hours work should notionally equate to 4 marks)
OCR recommended A3/PP allocations are indicated for each section – the total should not exceed 20

Product focus and analysis (8) (2 x A3/PP)

Products can be selected from any of 8 different focus areas:

- Built Environment and construction, Engineering, Food, Graphic Products, Manufacturing, Resistant Materials, Systems and Control, Textiles.

For marks in the top band all of the following should be addressed:

Detailed description of the intended purpose of one single selected named product (not a range)
Key Criteria used in the design of the product.
The needs of the manufacturer.
The needs of the consumer.

Where all four of the above have not been covered the centre should consider awarding marks in the lower bands. Moderators report that the 'needs of the manufacturer' section is not covered to sufficient depth.

Some candidates and some whole centre groups are still considering generic groups of products. The first page of the candidate product study should state quite clearly and categorically what **specific, single named product** has been selected for analysis.

- Candidates who do not present real time evidence and interactive dialogue should not be marked in the top band.

Ongoing comments from Moderators:

- A wide range of interesting products was chosen.
- Many centres are now showing the chosen product actually being used with the use of video.
- Some centres are not encouraging the candidates to show an image of the product in this section.
- Manufacturer needs is still the weakest area in this section. Points raised are very generic.

Strengths and weaknesses comparison (12) (2x A3/PP)

Good candidates should be encouraged to analyse the strengths and weaknesses of a *product* in *comparison* with similar products. Good responses often include a conclusion or summary, which relates similar products back to the single selected named product. Poor responses often include charts and tables populated with Internet images with no identification of the strengths and weaknesses of the selected product. Candidates should be encouraged to show evidence of actually using a range of products, which are compared with the selected product. For marks in the top band the following should be addressed: function, suitability of materials and manufacturing processes, ergonomics, aesthetics and cost.

Ongoing comments from Moderators:

- Candidates are not comparing a range of products against the original.
  It is not obvious which is the better product.
- Limited conclusions drawn.
- Little evidence of the candidates actually experiencing the products.
- A 'hands on' approach to this section is required!
- Some centres introducing video to this section, which enhances the work.
- 'Old table' format still being used by some centres. Some candidates however had made these interactive by the embedding of videos in the charts. This is an excellent feature to be encouraged.

Moral Implications (8) (1 x A3/PP)

Identify and analyse the moral implications associated with environmental, social and economic issues in the design and use of the product.

Moral implications should be considered in relation to the design and use of the product chosen for study:

The clear emphasis of this section is now on the moral implications associated with three specific issues. Centres need to prepare candidates for this by organising and structuring ethical debates about the environment, social cultures and economic issues. The term 'economical *issues'* should be avoided as it encourages a discussion of general cost issues, which is not what is intended. A far wider debate about the effects of the global economy and exploitation of workers is required. This section is very poor in many cases and moderators are making large reductions. Marks in the top band are not awarded in many cases. Centres may wish to consider inviting staff from 'critical thinking' or business departments to facilitate discussions, or inviting in visiting speakers.

Ongoing comments from Moderators:

- Many centres are not presenting a good response to this section and are content to award marks in the middle band for average responses.
- The ethical consideration of moral implications needs to be integrated into the AS course – it contributes to other areas of study.

Brief and specification for improving the product (8) (1 x A3/PP)

The design brief presented should relate to improving the single selected chosen product in some way. Centres should award marks in the lower bands where an improvement is not identified, or where the proposal is to redesign a complete product. Moderators still report that many candidates are still trying to improve too many aspects of their selected product.

- Proposals to redesign a complete new product should always be marked in the lower bands.

Specifications need to be detailed and justified, resulting from the objective analysis of the original product. Where there is little or no justification centres should award marks in the lower bands. It can help if the justification for each specification point is clearly identified by using a different font size, style or colour – better candidates often use this technique, and it would help candidates in the middle and lower bands.

Ongoing comments from Moderators:

- The majority of candidates identified an improvement or in many cases a number of improvements. (One will do!)
- The specification was not drawn from the analysis of the original product.
- Many focused on ergonomic improvements.
- Colour code, italics and tables were used to good effect.

Development of improvement (56) (10 x A3/PP)

This section relies on the integration of three separate requirements for successful completion. There is a very large allocation of marks for this assessment criterion; this is deliberate as it was considered during the development of this Unit that this is where the majority of candidates would choose to spend their time and energies. As there will be many different approaches to this section appropriate to different focus areas, it might be helpful to consider that the expectation in relation the notional guideline of 4 marks per hour means that candidates should devote 14 hours to this section.

56 marks is a very large allocation to accurately apportion in three mark bands and in the past some centres found this difficult. For the last three sessions OCR has provided a new CSF F522 form to make this task easier. The 56 marks have now been broken down into three sections as identified below. Additional advice is also given on the new CSF F522 form to award marks in different bands within each section. The new interactive mark sheet is available on the OCR web site. Please make sure this new form is used in the future as it enables marks to be appropriately awarded and cuts down clerical and addition errors. Please note that only the interactive form automatically adds up candidate marks.

The three sections:

Present a wide range of innovative/creative initial ideas, which demonstrate a high level of development using high quality annotated sketching, real time digital images and interactive dialogue. (14 marks)

The expectation here, for marks in the top band, is that a wide range of innovative/creative initial ideas are presented which demonstrate a high level of development using high quality annotated sketching. Simplistic sketches with little or no annotation should be awarded marks in the lower band. The expectation is that a specific improvement is developed, a few candidates try to re-design a whole product, and this is not the intention of this section.

Integrate this with real time evidence of a wide range of appropriate prototype models. (36 marks)

Moderators again reported some very high quality models were presented using a range of modelling materials. Many moderatos however pointed out that some centres were concentrating on producing one high quality single prototype. This may produce a high quality outcome but will not access the full range of marks available for the development of a wide range of appropriate prototypes.

Evaluate ideas against the specification in real time and justify the choice of one idea worthy of being taken forward. (6 marks)

It is important that Candidates evaluate their ideas against the specification and clearly justify decisions made. Where little reference is made to the specification, centres should award marks in the lower band. No marks at all should be awarded where there is no reference to the specification. Centres should note that it is impossible for candidates to access these marks if the original specification is missing.

Where candidates choose to annotate their ideas sheets, they must make it clear which specification points are being cross-referenced. Colour highlighting can help in this respect. Better candidates clearly rationalise the choice of one idea to be further developed. Interactive dialogue is mandatory in the development section, this can be best addressed by ongoing evaluation, which seeks the views of others and then provides evidence of responding to points raised.

Ongoing comments from Moderators:

- For this specification, for all focus areas, there is a need for presenting innovative and creative ideas, which are annotated. This is required for an E-portfolio as well as A3 portfolios – many candidates re-submitting again this January did not provide sufficient well annotated design sheets.
- In a small but significant number of submissions there was no evidence at all of any annotated design sketches, where no work is being presented –no marks should be awarded.

- The use of 'interactive dialogue' is mandatory in the development section –real time comments form third parties should be an essential feature.
- For this specification centres should encourage the use of ongoing evaluation on the candidate ideas sheets.
- Previous practice of tabulating responses to this section could still be relevant to the justification of an idea to be taken forward but should not be encouraged as the main mechanism for ongoing evaluation which is best provided in real time as ideas develop.
- 'We still need to see developed annotated sketching' –'marking of this is too high.' 'Often marks are awarded in the top band for poor work'.
- General standard of sketching quite poor.
- A great deal of 2D sketching.
- Some evidence of on-going evaluation through annotation, video and audio.
- Good use of CAM modelling.
- Range of modelling materials used.
- Some good instances of centres integrating the modelling more and using it to develop the idea.
- Some very high quality models which enabled realistic testing to take place.
- Good quality photographic evidence in most centres.
- Table approach to evaluation used less and candidates are using other pupils to evaluate with the use of video.
- Significant number of good quality but single products produced, not a wide range.

Testing of final developed idea (12) (2 x A3/PP)

There is no requirement to make a test rig – Candidates can if they want to! (Many candidates again produced test rigs in this session) Any appropriate method or system to formally test and evaluate the final developed idea will meet this requirement. Testing must be formally planned and implemented. Appropriate tests might include using a product or getting others to use it, wearing it or getting others to wear it or eating it or getting others to eat it. A scientific or technical test could also be appropriate for some focus areas. Whichever method is thought by the candidate to be appropriate – there must be formally presented results. The results should be presented in real time, clearly and concisely. Many candidates are still using customer surveys; some of these produce low level numerical data, which was of little value. Candidates should be encouraged to deepen the level of their analysis. It is worth emphasising again that real time evidence is required. Copying out neatly the responses of others is counter productive- it could actually result in reduced marks if there was no real evidence of real people being involved. Presenting blank questionnaires in this section should be discouraged.

Ongoing comments from Moderators:

- Test rigs are still being produced rather than testing the final design. (these are still acceptable but should not be contrived)
- Testing of the product often involved a customer survey or a questionnaire, which produced low-level numeric data.
- Some excellent examples of testing by outside agencies related to the chosen product.
- Videos used well by centres using PowerPoint in this section.
- Centres should make candidates aware of the need to plan as well as carry out testing; this feature is often omitted and leads to moderation adjustments. In general if no planning is evident marks should not be awarded in the top band.

Produce a summary of the results of the product development with detailed analysis of how the prototypes and final tests contributed to establishing the validity of the chosen idea.

Present one further improvement in detail. (8) (2 x A3/PP)

In addition to the presentation of the final test results, Candidates should summarise the results of their prototyping and suggest one further possible improvement to the product. There are three distinct sections to this assessment criterion. For marks in the top band, all three areas need to be considered. Better candidates show a clear annotated sketch of a further improvement. Analysis of results is also a more complex matter than simply stating results in a table.

Ongoing comments from Moderators:

- Some candidates completed a separate section as a conclusion; others relied on the summary produced during the development section.

Communication (8 marks)

Use a wide range of high quality text, graphical techniques, digital technology, and interactive dialogue as appropriate to present information. (8 marks All 20 A3 sheets/PP slides)

The use of ICT must be included in the range of communication techniques used in the presentation of the folder; an over-dependence on the use of ICT/CAD should however be avoided. A combination of different approaches is to be encouraged. Candidates should not over enhance the background of their ideas sheets if this impairs the clarity of presentation. Many moderators reported again that it is hard to read through some 'over decorative backgrounds. Some candidates spend a disproportionate amount of time in enhancing the appearance of their pages, often at the expense of clarity. Candidates presenting on CD still need to provide evidence of annotated sketching. This assessment requirement is not met by scanning in a few small images amongst other computer generated designs.

- For this specification the use of 'real time digital images ' is mandatory – they have to be used to record evidence of work as it actually happens.
- OCR is encouraging the use of short video clips, with sound bites (interactive dialogue) recorded as part of an E-Portfolio on a CD.
- If the preferred option is to continue to use a paper portfolio – Digital photographs must be used and interactive dialogue must be presented in alternative forms which show a positive response to the first hand opinions of others. Overlay sheets could provide an opportunity for comment without affecting the quality of candidate presentation. Comments should not be retrospective and re-typing should be avoided.
- Communication in this specification relates to the whole product study.
- Candidates should not over-enhance the background of design sheets.
- The use of Arial 10 pt (min) should be encouraged for PowerPoint presentations –this is widely available and does not corrupt.
- Some whole centres submit the work of all of their candidates in a form that cannot be accessed with the equipment that most moderators use. It is absolutely essential that all individual CD's are trialled on an independent laptop to ensure that all video clips and sound files have been correctly transferred to the folder. Candidates should be discouraged from using files from I pods, I tunes, and mobile phones if they are not compatible with a standard PP presentation. Additional steps should be taken for the next session to ensure that files produced by candidates using PP2010 can be viewed fully on a standard pre 2010 laptop.

Ongoing comments from Moderators:

- The vast majority of folders were well organised and matched the layout of the mark scheme.
- Many case of imaginative use of digital technology and some interactive dialogue. Centres should be encouraged to use digital technology to enhance the quality of the candidates work.
- Centres should be encouraged to develop e-portfolios at the earliest opportunity.
- Candidates using PowerPoint are advised not to over-enhance their presentations as dynamic effects can detract from academic content.
- Some candidates are still spending a considerable amount of time detailing the manufacture of models – there are no marks for this.
- Many centres still appear to be using A3 paper folders.

Summary of Main features for Unit F522

- The ethos of the Unit remains – A single specific named product is selected and shown in use – a detailed description of the product is given together with needs of manufacturer and consumer. Key criteria are identified. Throughout the study an identified improvement is developed and evaluated.
- A 'real time' digital image of the selected product in use will be an essential feature.
- Products for analysis can be selected from any of 8 different focus areas:
- Built Environment and construction, Engineering, Food, Graphic Products, Manufacturing, Resistant Materials, Systems and Control, Textiles.
- Work can be presented on 20 sheets of A3 paper or CD ROM equivalent to current OCR approved standard. (currently PP)
- Please consult the OCR guidance booklet for submitting E-Portfolios. In particular guidance on 'Pack and Go' or ‘Package for CD’ facility for PowerPoint. Videos will not work without this facility being used. This booklet stipulates acceptable formats and should be strictly observed.
- For the Product Study please do not over enhance backgrounds.
- Please use Arial font at least 10pt – this is widely available – can be read easily – does not corrupt.
- If video clips are used: 3–5 of no more than 20 sec. each would be appropriate. Make sure they work from an individual CD on an independent stand-alone laptop.
- A candidate must submit either an A3 paper folder or an individual CD not both.
- A Centre can submit some candidates work as A3 paper folders and some as CD's.
- Centre and candidate name and number must be on all paper and individual CD's.
- CD's must have full details on both the outside cover and written on the actual CD.
- Work must be recorded in real time and digital technologies must be used.
- The ideas section and modelling are linked in a section called 'Design Development'. The approach to this section will differ depending on the focus area studied by the candidate. The key thing is that the development is appropriate to the product and the focus area.
- For this specification prototype modelling should be fully integrated in to the development of creative ideas and ongoing evaluation. Different focus areas should respond with an appropriate balance of prototyping that suits the development of improvement for their selected product.
- Centres and candidates should note that creative/innovative ideas should be presented through a wide range of high quality annotated sketching. It is essential that this is represented in both A3 and CD based projects.
- It is important that all focus areas do respond with presenting an appropriate range of prototyped developments.
- One single ‘final prototype' is not within the overall ethos of the specification.

- The requirement to make a test rig is no longer necessary this has been replaced with the need to plan and implement an appropriate test on the final developed idea it is however still possible to submit one if it is considered an appropriate test.
- Communication skills should include the use of digital technology, and interactive dialogue – candidates who fail to use these techniques should be marked in the lower bands.
- Interactive dialogue involves discussing the selected product/comparative products/prototype development/ongoing evaluation and testing with others and responding to suggestions made. It could be used in other sections –many candidates use this feature to advantage in the moral implications section. In all cases evidence of interaction should be recorded in real time with the active comments of those involved recorded first hand and not retrospectively. Re-typing of genuine first hand comments is totally counterproductive and should be avoided.

- **For future sessions it is essential that centres take steps to ensure that work produced by candidates using PP2010 can be viewed on a standard pre 2010 laptop.**

F523 Design, Make and Evaluate

General Comments

There was only a very small entry in this session. Many candidates resubmitted coursework from the June 2011 session, and it was evident that efforts to improve the standard and quality of responses had been made.

Candidates had chosen a range of coursework titles that were appropriate to the requirements of the examination. There was considerable variation in complexity and demand, in terms of both designing and making.

Whilst it was pleasing to see sensibly scaled projects on the whole, in some cases the overall complexity of the projects as executed and the range and/or depth of skills involved in the design development, making and evaluating was insufficient for candidates to attain the marks awarded by the centre. In these cases adjustments were necessary to bring the centres assessments into line with the OCR standard.

Generic responses to the assessment criteria were common, where responses did not relate directly to the specific project and which lacked the focus and relevant detail required at A2 level. Such work was often over-rewarded by centres, where marks in the lower bands were more appropriate.

In most cases there was limited reference to the commercial and marketing aspects of design and manufacture throughout the project, although it was pleasing to see the benefit of greater reference to the needs of a client or specific target audience.

Some candidates' portfolios did not follow the assessment headings. In these cases it was difficult to follow the process of design and to interpret the evidence presented.

Skills in a wide range of applications using ICT, CAD and CAM were seen, and some candidates presented a professional standard of work. The downloading of large sections of text and images from the Internet is of limited benefit at this level and a more personal and interactive analysis of data and products is recommended.

The majority of candidates entered this session used PowerPoint software to record and present their coursework as an electronic portfolio. Some file sizes were excessive, and Moderators had to wait for several minutes for files to open.

Comments on Individual Sections

1 DESIGN BRIEF 3 marks

Present a design brief for a marketable product

- Four key areas need to be addressed in this section for maximum marks to be possible:
- Brief details of the CONTEXT – the situation, the problems, the need……
- A clear and precise BRIEF – what the candidate will be designing, making and evaluating.
- Clear reference to MARKETING – details of the target market/client – the important aspects of design and manufacture if this product is to be marketable.
- Reference to KEY ISSUES that will be important during the designing.

The marking of this section tended to be lenient when compared with the OCR standard. The majority attained the middle mark band.

2 INFORMATION, INSPIRATION and INFLUENCES 9 marks

Obtain information relevant to the design of the product

Present a range of evidence to show the sources of inspiration and influences on the designing

Very high marks were frequently given when there was no primary research or 'personal-contact' investigation and little inspiration derived from the evidence. This resulted in Centres' marks being lenient in most cases in this section. For marks to enter the top mark band (7–9 marks) there must be clear evidence of:

- personal contact (person to person, not via email or letter etc) with a client or representation of the target market

AND/OR

- personal contact with existing/similar products (the actual products – not internet image, photograph, etc.)

Similarly, quantitative and technical data such as measurements, capacities, weights, and timings, are necessary if high marks are to be awarded.

3 DESIGN SPECIFICATION 3 marks

Produce a design specification for the product

For the highest mark to be awarded in this section, candidates must state detailed requirements by reference to specific aspects of the product, including technical, numerical, measurable targets. This will include sizes (eg maximum or minimum/range of adjustments, positions), capacities, weights, quantities, nutritional values, costs/budgets, performance, life span, and features required, wherever possible. Candidates' responses mostly fitted the descriptor for the middle assessment box, with very few candidates scoring full marks.

4a DESIGN, DESIGN DEVELOPMENT and MAKING 57 marks

Demonstrate competence in the design, design development and making of the product, to include the following package of evidence:

- **the generation and exploration of design possibilities**
- **the use of digital technologies**
- **experimenting and modelling**
- **the refining and defining of a final design through ongoing evaluation, and**
- **the planning and making of the product**

The package of evidence presented by candidates in this section should include all five key areas listed above.

The overall sophistication, difficulty, and intellectual challenge involved in the designing and making will influence marks in this section. A simpler project will need to be carried out in greater depth to achieve the same marks as a more complex project.

In general, candidates displayed an integrated approach to designing, with freehand sketches, 2D and 3D modelling including computer modelling and evaluative commentary used to communicate design thinking and a progression of design.

- **the generation and exploration of design possibilities**

  Most candidates produced a useful range of initial design possibilities, although some showed little innovation or exploration and were based on fairly obvious commercially available designs. In a significant number of cases a more thorough development phase (to expand and confirm design detailing) was needed rather than a huge jump from a chosen design concept to final chosen product.

- **the use of digital technologies**

  Digital technology such as photography, scanning, CAD was used, and videos in e-portfolios. Also CAM was used in the modelling and making processes, with candidates usually presenting appropriate evidence to support the centre assessments. The use of digital technology by some candidates was of a professional standard, but the quality of photographic images was less praiseworthy in some cases.

- **experimenting and modelling**

  Candidates used experimentation, trials, visualisations and simulations in an integrated way to test design possibilities, to explore different concepts and design details, and to aid the development and refinement of their designs. To raise attainment, candidates are encouraged to further expand their design development through modelling and experimenting.

- **the refining and defining of a final design through ongoing evaluation**

  In general, centre's assessments of the level of competency demonstrated by candidates in this section were lenient when compared with the OCR standard. Greater attention to technical aspects in the refining and defining stage of design development is needed to improve candidates' performance in this section. Details of dimensions, materials, construction, ingredients, components, and fittings, are needed to access higher marks.

- **the planning and making of the product**

  Some candidates included evidence of planning but this was often more of a retrospective log or diary of making.

  There was a wide variety in the quality and scope of products. Centres' assessments were sometimes generous with high marks awarded to well finished but undemanding products.

4b INNOVATION 15 marks

Show innovation

In a few cases, centres had awarded a mark in the top mark band, alongside marks in lower bands in most other sections of this Unit. Although this is not an impossible scenario, only in rare cases might high marks be justified in this section alongside much lower marks in other sections. Marks are normally expected to be *'proportionate'* to marks in other sections. An assessment of the innovation shown will be influenced by the overall complexity, challenge, and level of difficulty involved in the project as a whole.

5 TESTING and INDEPENDENT EVALUATION of the FINAL PRODUCT 9 marks

Show evidence of the testing of the final product against the specification

Identify and state strengths and weaknesses in the product

Respond to independent evaluation

There are three clear requirements for candidates' responses if they are to satisfy the assessment objective:

- TESTING to the Specification
- STRENGTHS and WEAKNESSES
- INDEPENDENT EVALUATION

For the highest mark to be awarded, all three elements need to be covered thoroughly and in depth. In many cases the Moderator was unable to confirm high marks awarded by the centre where candidates had not clearly addressed all three requirements.

6 MARKETING PRESENTATION 15 marks

Using appropriate techniques create a marketing presentation suitable for the final product

It is recommended that centres make the teaching of the principles of marketing a higher priority. In a significant number of cases candidates did not show consideration of the basic aspects of product distribution, selling, and promotion.

For marks in the highest mark band to be awarded, a thorough, in-depth coverage of all key aspects is needed, including designs for promotional materials such as posters, leaflets, advertisements, presentations, and websites. Responses covering a more limited range of aspects in depth, or a wider range in less depth, should be given marks in the middle mark band.

Specific marketing aspects needing consideration in this section include:

- The 'Unique Selling Proposition' (USP)
- The '4 P's of Marketing' – Product, Price, Place, and Promotion
- Suitable media for the promotion of the product
- Product identity and branding
- A product 'logo' or trademark
- Packaging – the presentation and protection of the product.

7 REVIEW and REFLECTION 9 marks

Review and reflect on the effectiveness of the designing and making process that led to the final product

Consider the possible wider implications and impact of the product, including possible future developments

There are three clear requirements for candidates' responses if they are to satisfy the assessment objective:

- REVIEW and REFLECT
- WIDER IMPACT
- FUTURE DEVELOPMENTS

For the highest mark to be awarded, all three elements need to be covered thoroughly and in depth. In many cases the Moderator was unable to confirm high marks awarded by the centre where candidates had not clearly addressed all three requirements.

Specific considerations in this section include:

- An insight into the process of designing and making.
- Honest comments about the learning that has taken place.
- Use of Life-Cycle Analysis (LCA) to evaluate the wider impact of the product.
- Moral, ethical, and sustainability issues, together with economic and manufacturing issues.
- The likely success of the product in the market-place.
- Developments relating to potential industrial and commercial production (diagrams).
- Future developments including quality improvement or design variations (diagrams).

F524/01 Component 1

General Comments

The most popular question was Question 6 Resistant Materials followed by Question 4 Graphic Products. The vast majority of candidates fully complied with the rubric but some attempted more than one question. This should be discouraged as the quality and detail of the response for this paper would be limited and it would restrict the amount of time that they spend on the F524/02 paper. This consequently impacts upon the overall mark.

Parts (a), (b), (c), (d) and (f) were common across all questions.

For part (a), most candidates were able to give at least two justified design requirements for the given product. A number gave generic product requirements or very brief, simplistic and unjustified statements, which did not receive a mark.

Many candidates achieved high marks for part (b). Most were able to give two examples where anthropometric data would be used in the design of the context given. A significant number of candidates focussed on wider ergonomic features, which did not gain any marks.
Some candidates answering Question 6, did not achieve marks by focusing on the drinks container rather than the tray as instructed.

Part (c) was generally well answered. The most common correct responses were that goods/products must conform to the description given and that the goods/products should be fit for purpose. A number of candidates did not achieve full marks by giving very brief descriptions of warranties and guarantees, or safety issues, without reference to the Sale of Goods Act.

Part (d) was generally well answered. Geothermal and wave were the most popular choices. Most candidates used an annotated sketch to support their answer. The majority of candidates clearly explained the benefits to society of their selected energy production system but many did not explain the system. The best responses described the main principles of the system and focussed on how the environmental and cost benefits.

Part (e) assesses specific material content from the focus area.

Most candidates answered (e) (i) well, stating a specific material example with appropriate properties or performance characteristics given for Questions, 1,2,4,5,6 and 8. In some cases, reasons for choice of material were not related to the requirements of the product in question. There were no responses to Question 3.

For part (e) (ii), most questions include the instruction for candidates to *'Use a flowchart and/or annotated diagrams to support your answer'.*

In most cases candidates made the decision to use annotated diagrams to ensure that they include sufficient detail to access higher marks. Some candidates produced very detailed and full flowcharts to include the same level of technical detail. A significant number of candidates however produced a flowchart with very limited detail to describe the given process, and consequently did not achieve good marks.

A number of candidates did not fully comply with the rubric for (e) (ii). Some candidates missed key elements of the question eg batch size was not considered for some questions. For Question 6, it would be very unlikely that a batch of 250 trays would be injection moulded.

Part (f) was a 'discuss' question. Candidates were generally well prepared to raise and explain a range of issues and include supporting evidence or examples.

There was a wide range of responses to part (f). Some candidates gave full and detailed responses raising issues such as the opportunity for new products, increased functionality of products and cost implications. A number of candidates did not access the higher mark ranges by giving general responses on how designers select materials for products and did not focus on 'the availability of new and smart materials'.

A number of candidates missed out on achieving full marks by not including additional evidence or examples of smart materials to support their answer.

Further comments related to parts (e) and (f) are referred to in the Comments on Individual Questions.

Comments on Individual Questions

Question 1 Built Environment and Construction

More candidates attempted this question this year. Some gave very detailed and structurally correct responses to the construction of an internal load bearing partition. Some candidates attempted this question with no understanding of accepted construction techniques.

Question 2 Engineering

Although a very limited number of candidates attempted this question, the responses to parts (e) (i) and (e) (ii) were generally good.

Most candidates correctly identified a specific plastic and gave two appropriate properties. Some candidates used a flowchart with annotated diagrams to produce reasonable descriptions of the process to manufacture the seat rail. Not all candidates included full details of the special tooling required and quality control checks employed.

Question 3 Food

There was a very limited response to this question.

Question 4 Graphic Products

For (e) (i) many candidates stated card as an appropriate material. Only specific types of card such as solid white card or card 160–300 gsm, achieved a mark.

Whilst there were a number of very good answers to (e) (ii), a significant number produced very brief flowcharts, lacking in detail.

The best responses made good use of annotated diagrams, in some cases as part of a flow chart, to fully describe the process of embossing and the application of a high gloss finish to the perfume box. Some candidates did not comply with the rubric and described cutting and printing processes.

Question 5 Manufacturing

A number of candidates attempted this question. Almost all identified an appropriate material with appropriate properties for the side section of the ladder for (e) (i). Although aluminium was accepted as an appropriate material, aluminium alloy would be more appropriate.

There were a few excellent responses to (e) (ii). Most candidates produced flow charts (including appropriate sketches) of the extrusion of the side section. Most candidates described appropriate quality control checks.

Question 6 Resistant Materials

This was the most popular question with a wide range of responses. There was a wide range of materials proposed for (e) (i), the most common being aluminium, stainless steel and ABS. Most candidates gave two appropriate properties.

Some responses to (e) (ii) were outstanding; fully detailed methods describing the production of a batch of 250 trays, including details of the jigs and formers required.

A number of candidates did not access full marks by not taking into consideration the lip of the tray.

Some candidates described methods, eg Injection moulding would not be appropriate for a batch of 250.

Question 7 Systems and Control

There was a very limited response to this question. Most candidates correctly stated an appropriate type of battery for (e)(i).

A few candidates achieved high marks by drawing a spur gear system with a correct reduction ratio.

Question 8 Textiles

Very few candidates attempted this question.

Most were able to identify an appropriate fibre for the neck tie and were able to give appropriate performance characteristics for part (e) (i).

There were some outstanding responses to part (e) (ii). They were fully detailed and were a combination of flowchart and annotated diagrams. Some candidates did not access the full mark range by not giving full details of pattern pieces.

F524/02 Component 2

General Comments

It would help examiners if centres encouraged candidates to circle the question number attempted on the first answer sheet and to write their name and candidate number on each answer sheet. It would also be helpful if centres did not fasten the answer sheets together but simply placed them inside the folded cover sheet for each candidate.

Work of Candidates

This unit requires candidates to draw on knowledge and experience from the whole course to show an understanding of how products are made and how they meet the needs of users and manufacturers. It is pleasing to see increasing evidence of creative and innovative design thinking which is a key thread through all units of the course.

It is important that candidates are prepared for the need to support their design proposals with the technical knowledge of materials and manufacturing processes that would be necessary to produce a developed practicable design solution. Without this significant marks will be lost.

Comments on each of the marking criteria:

Specification Points (S):

Candidates are asked to write three specification points. To be awarded full marks each point must be directly relevant to the brief and justified in relation to the function of the product, the potential user or the manufacturer of the product.

Candidates continue to lose marks in this section by simply repeating information given in the question or making generic points relating to issues such as the need to be cost effective, aesthetically appealing or ergonomically suitable. Such generic factors, which are relevant to all products, are not given credit unless they are carefully justified so that their particular relevance to the product being designed is clearly stated.

Candidates are strongly advised to consider the key functional aspects of the product when writing their specification points.

Range of Ideas (R):

To achieve high marks in this section there are two complementary demands: firstly to produce a number of different concept solutions to the design brief set in the question, secondly to develop each concept to show details of possible alternatives and to consider how modifications could better suit the needs of user and manufacturer. Particular credit is given for innovative ideas that show an original approach to the design brief; this has significantly improved this session.

The majority of candidates performed quite well in the first of these demands but many failed to reach the higher marks because they showed little if any evidence of development beyond the initial concept. In a few cases ideas presented were unrealistic with little prospect of fulfilling the design brief. High marks cannot be awarded for ideas, which are completely unsuitable, with little or no prospect of satisfying the set brief, even if a suitable number of different ideas are present.

Less able candidates simply presented a broad outline of initial ideas, which frequently were based on established commercially available products.

Technical Detail (D):

Assessment of this criterion was based on three strands:

- consideration of methods of construction, assembly or manufacture;
- understanding of suitable materials, components, or ingredients;
- details of dimensions or quantities.

At this level of examination candidates are expected to have detailed knowledge of construction, assembly and manufacture of commercial products from their focus area and to be able to relate this knowledge to their own design proposals. The more successful candidates showed good subject knowledge by offering realistic options for construction and justified choices of materials by reference to their properties and performance. In some cases suggestions for construction and materials were inappropriate whilst a significant number of candidates made no reference to specific materials or construction details at all. No credit can be given for generic terms such as 'wood', 'metal', 'plastic' or 'card'.

A few candidates continue to include 'textbook' diagrams of manufacturing processes. This is not appropriate for this unit where examiners are looking for reasons for the choice of a particular process rather than a detailed explanation of how the process is performed.

In most cases dimensional detail was somewhat sparse with relatively few overall dimensions given. For full credit in this area at least some more detailed dimensions must be given, for example thicknesses of material or sizes of standard components, which would be used to produce the product.

Evaluation of ideas with reference to specification and volume production (E):

This was a weak area for many candidates who failed to carry out any meaningful evaluation of their ideas. This is very disappointing because the skills of evaluating form a significant part of all of the assessed units of the course of which this is the last.

A small minority of candidates considered how the product would be used and manufactured and drew attention to both positive and negative aspects of their designs.

Final Developed Outcome (F):

In this section candidates are asked to 'sketch a final developed outcome' and to 'justify key design features'. To access the higher marks it is important that a complete final idea is sketched rather than isolated components, which do not form a coherent whole. Justification of the choice of features was often unnecessarily lengthy: a concise statement relating to the function of the product, or appeal to the user or manufacturer is all that is needed.

Communication (C):

The mark awarded for communication is based on a combination of factors:

- The overall clarity of presentation evident in the layout of the three design sheets of the paper.
- The range and quality of graphical skills evident.
- The use of clear annotation which communicates the quality of the candidate's design thinking.

When preparing for this unit it is important that candidates practice the use of a range of graphical techniques (for example 2D, 3D sketching, cross sections, exploded views) and the appropriate use of these to show construction and assembly detail.

Techniques of annotation (for example using arrows to connect comments to specific points), which avoid long passages of text, would also help candidates communicate speedily and effectively.

The more able candidates show impressive skill, managing to communicate broad concepts whilst also including useful detailed sketches and notes on clear, attractive sheets.

Comments on Individual Questions

Question One: A permanent structure suitable for use by a variety of performers. (Built Environment and construction)

It is clear that this question is frequently answered by candidates who have had little preparation for, or experience of this focus area. Many attempts show an admirable range of ideas but lack the technical knowledge of construction and materials to achieve high marks.

Question Two: A barrier system suitable for use at a variety of outdoor events. (Engineering)

Too few questions were seen to make general comments.

Question Three: Hand held lunch product. (Food)

Too few questions were seen to make general comments.

Question Four: Fruit and vegetable carrier. (Graphic Products)

There were some excellent responses to this question, which showed good creativity and sound technical knowledge of the manufacture of graphic products.

Question Five: Product to enable items on high shelves to be reached. (Manufacturing)

This question allowed candidates to produce a wide variety of design concepts including reaching aids and steps. Most candidates focussed on a single type of product, which made it more difficult to score highly for their range of ideas. A significant number of candidates resorted to designs for large, elaborate contraptions of dubious practicality.

Question Six: A product to collect and dispense rain water. (Resistant Materials)

This was a popular question with some excellent detailed responses. Most responses were variants of a water butt with hose attachment although the more able candidates did develop useful design features pertinent to children who were the likely users of the product.

Question Seven: A product to pick up fallen leaves. (Systems and Control)

Too few questions were seen to make general comments.

Question Eight: Versatile, adaptable storage. (Textiles)

Too few questions were seen to make general comments.

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