OCR
RECOGNISING ACHIEVEMENT

GCE

Design & Technology

Advanced GCE **A2 H453**

Advanced Subsidiary GCE **AS H053**

Examiners' Reports

January 2011

HX53/R/11J

Oxford Cambridge and RSA Examinations

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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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EXAMINERS' REPORTS

Chief Examiner's Report to Centres

This was the first 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, F523 Design, Make and Evaluate and F524/02 Product Design Component 2 show increasing examples of exciting and innovative exploration and modelling of ideas.

The new specification has been broadened to allow access to candidates from eight focus areas.

The majority of candidates had a Resistant Materials focus with large numbers from Textiles and Graphics. There were an encouraging number of candidates entered from Built Environment and Construction, Engineering, Manufacturing and Systems and Control. It was disappointing to see only a very low number from a Food focus.

There were some excellent examples of creative thinking in F521: The Advanced Innovation Challenge. This new and exciting assessment unit has had impact on the other units. Centres are more familiar with the examining routine and candidates are expanding their range of design thinking.

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

Exceptional work was presented for assessment for the Product Study Unit F522 and the Design, Make and Evaluate Unit F523. It is encouraging that increasing numbers of candidates are submitting work as e-portfolios for these Units. Candidates have used digital technologies to record the development of work in 'real-time' and shown effective evidence of interactive dialogue.

Radical changes were made to the Design, Make and Evaluate F523 Unit compared to the legacy specification. Centres are to be congratulated upon the way in which they embraced the new Unit and prepared their candidates. The changes were made to give more freedom to candidates to focus on the key elements when designing making and evaluating and to enable teachers to decide upon what level of intellectual demand and skill candidates had demonstrated when assessing their performance. The change in emphasis on assessment takes into account the differences of working in all of the material focus areas and will ensure a fair judgement. The written papers F524 are also a radical change from legacy in format, although the style and demand of questions are very similar to the previous specification.

The majority of responses to F524/01 and F524/02 were for Resistant Materials with large numbers attempting the Graphics Products and Manufacturing questions.

Although the overall standard on both papers was good, 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. The following reports contain detailed breakdowns of general candidate performance of the January 2011 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 and additional paper of any kind should not be stuck into the booklet. There is also no need for candidates to stick models or samples of materials into the booklet, photographs, sketches and notes will be sufficient to communicate ideas to the examiner.

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 approached the challenge with pre-conceived ideas and have failed to respond directly and creatively to the design challenges. It is not advisable to second-guess questions as this can also hamper creativity. The way in which Centres use the pre-release theme can have a significant impact on the responses. 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. There also seems to be some evidence of 'recycling' of answers to previous challenges e.g. bins/seating/seating with shelters; rather than having a completely fresh approach. This tends to result in a weaker narrow response rather than fresh new innovative thinking.

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.

Centres are reminded of the specification content:
"A theme is released in the September prior to the examination. Each theme runs for a year, enabling candidates to research and gather resources to form a personal handling collection/inspiration box/mood board. Candidates should identify and collect these resources individually, into a collection called a 'job bag', which is then taken into sessions 1 and 2. A challenge sheet based on the theme will be included with the workbook and will first be seen in session 1."

Candidates must not share resources or job bags during this examination.

Photographs

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. The addition of a card with the candidate's name within the photograph can be used to aid the return of photos to students but the photograph should focus on the work.

Centres are reminded that three "teacher" 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. A small number of candidates did not stick photographs in the correct place. Photograph 1 is of modelling progress after first session, Photo 2 progress after the second session and Photo 3 the final model. Space in this area allows for an extra photograph of the final model if necessary to show detail or workings. More 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.

It is also worth noting that "skills involving analysis, evaluation and synthesis (creation of new knowledge) are considered of a higher order, requiring different learning and teaching methods, than the learning of facts and concepts". Centres should teach evaluation and analysis throughout the 'AS' year in order for candidates to achieve greater success in these areas. It is notable that areas such as specification, evaluation of ideas and final products and the realisation specifically test these skills and are areas that continue to discriminate well between candidates. 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 in a more creative way. Pre-prepared work taken in as part of the job bag

such as specifications and mind maps can result in candidates producing generic work rather than work that directly responds to the specific challenge.

The Challenge Assignment

Initial Thoughts

Candidates used a combination of text and drawings to explore the challenges within the theme of 'public spaces' and identified possible design areas/problems. Some candidates failed to think creatively about the challenge or context and suggested only very predictable responses. 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. The better responses show greater creative thought as well as consideration of how/when/where and who by the product may be used. Some candidates are not fully responding to the challenges set.

Design Brief

Many candidates restated the challenge 'word for word' in this section. 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.

Specification

This section continues to discriminate well between candidates. 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, unless made relevant to the question and answered through specific references to the situation and theme. Careful justification of points is needed. It is disappointing that a significant number of candidates continue to produce specification points that lack justification. Specific detail is required for high marks in this section, e.g. weight, size and material properties. There is often evidence of mnemonics or prepared lists, as an aid to memory, used to prompt candidates to cover a broad range of specification points. Unfortunately, this often leads to a list of generic points.

Ideas

Higher performing candidates produced a range of functionally different creative ideas that clearly related to their specification, situation and the potential users. Most candidates produced a suitable range of creative ideas, although for some it seemed difficult to move away from one basic concept, meaning that all ideas were essentially the same, with relatively superficial changes in shape or configuration. Originality and creativity are key aspects of this criteria.

The standard of design communication was generally very good. 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. Annotation in some cases lacks sufficient evaluative comments and specific material and manufacturing techniques; in a significant number of cases annotation for this section was purely descriptive and showed no real evaluation at all. Many candidates only focussed on the positive aspects of their ideas.

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.

Group Feedback

The majority of candidates planned for the presentation and recorded the outcome. Where candidates scored highly they had taken the feedback and responded giving suggested improvements with the use of sketches to illustrate.

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. Candidates will have information in their job bags about suitable materials and specific names and details are expected; candidates should be encouraged to consider and explain their choice of materials. 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 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.

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

Reflection – this section has improved but some candidates are still focussing on the problems they had encountered rather than details on all the possible solutions.

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 lost marks when they failed to show all parts of their product through the model, e.g. if it has moving parts these were not modelled. In a few cases candidates used inappropriate materials for their model making. In some cases candidates attempting to model in resistant materials were unable to show all aspects of a model due to time limitations.

Good preparation for the examination, by the Centre, in terms of proving a suitable range of modelling materials is really important. Most Centres seemed to provide appropriate modelling materials Where a wide range of items were provided the candidates were unrestricted and able to reflect their design fully. 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.

In a few cases the quality and number of photographs made it difficult to judge the real quality of the models made.

Evaluation

Many candidates fail to record any further modifications in sufficient detail and some don't indicate any possible weaknesses of their product. A small number of candidates just talked about their model and not the product so failed to score any marks.

Evaluations should link to the specification and identify weaknesses or points that can be improved upon. This is an example of higher order thinking skills mentioned at the start of the report.

Comments on Individual Challenges

Generally the most popular questions were the seating, litter and sculpture, challenges two, six and one.

Responses to most questions were similar in quality, with all questions allowing scope for creativity.

Challenge One – An interactive sculpture for a library

Some exciting and creative responses were seen, ideas often developed themes around reading and characters from books, some candidates failed to respond to the bullet point about movement or interactive. Good consideration of the users' needs and safety were evident in most responses.

Challenge Two – seating for an outdoor space

This was a very popular question and some highly creative responses were presented. A number of candidates failed to fully address the challenge requiring seating for a minimum of two people that would be sensitive to the surroundings. Responses were varied with some candidates producing solutions for an urban space and others for the countryside; most candidates thought carefully about the user and environment for which the product was intended.

Challenge Three – a sustainably packaged cold refreshment

The responses to this question tended to focus fully on the food and its nutritional value; some solutions did not address the need for sustainable packaging and that the food was to be consumed when out and about.

Challenge Four – a product to provide entertainment and interaction in a waiting room

There were some exciting and creative responses to this challenge, most candidates thought carefully about the use of such a product in a public space. Good consideration of the users' needs and safety were evident in most responses.

Challenge Five – a free gift to be given away at the opening of a new eco outdoor space.

There were some innovative wide-ranging responses to this question. A small number of candidates failed to read the challenge carefully and designed an eco friendly outdoor space. Candidates should all be reminded to read the challenges fully and address the bullet point.

Challenge Six – chewing gum and cigarette disposal
There was a wide range of creative responses to this question from bins to personal litter collection devices to be carried by an individual. Most only considered the needs of the user, who was disposing of litter, rarely was the method of emptying the bin mentioned. Good consideration of the users' needs and safety were evident in most responses.

Reflection Paper

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 generally well answered demonstrating an understanding of Human Factors and usability. A small number of candidates failed to cover human factors at all in their response, perhaps due a lack of understanding of the subject area. The majority of candidates managed to give a suitable response discussing usability issues relating to product, age and ability, anthropometry and inclusive design. Most were able to suggest modifications they would make to their product to make it more ergonomically suitable/inclusive to a broader range of users, i.e. the elderly, the disabled or children. Most were also able to suggest improvements to the human interface and good responses provided detailed sketches to accompany their improvement. The better candidates were able to discuss materials and manufacturing techniques that could be used to achieve better ergonomics and usability and the cost implications of this. No marks were given for manufacturing methods unless related to improving the products ergonomics and usability.

Question 2:

Candidates generally scored less marks for question 2, although the majority were able to give the scale of production to be used. The more able candidates were able to discuss the manufacturing & materials implications related to the scale of production they had chosen. However some just gave general points about the material being used in terms of their properties. A number of candidates suggested processes not suitable for their chosen level of production.

Most candidates were able to give ways to improve the economic viability of their product. However a significant number of candidates thought that by using recycled materials this would make their product cheaper (when in a lot of cases it would do the opposite) and many simply suggested 'make the product smaller'. Some candidates referred to sustainability rather than economic viability, perhaps misreading the question as environmental rather than economic.

It should be noted that candidates should read each bullet point carefully and address each to ensure access to the full range of marks.

F522 Product Study

General Comments

The entry for the Product Study in January is typically much smaller than in June and consists mainly of re-submitted candidates from the previous June session with a smaller number of substantive Centre entries made for the first time.

Where work is re-submitted, either as a whole group, or as individual candidates amongst a larger group of candidates it would be very helpful to moderators if any additional work undertaken is clearly indicated. This can be successfully achieved by the addition of annotated 'post it' stickers to new A3 pages or additional CD Power Point work being annotated on screen. The practice of resubmitting studies with no additional work undertaken and with marks re-allocated to different assessment criteria is to be discouraged. An amount of re-submitted work was seen by moderators where there was no justification for any increase in marks from a previous session the work appeared to be identical with an unjustified increase in Centre marks.

Some Centres, usually with substantive entries, submit work from more than one group of candidates which is clearly identified on the CSF mark sheet. It is absolutely essential in these circumstances to ensure that a rigorous internal standardisation process is undertaken to establish a reliable rank order of candidates. It would also be appreciated if Centres differentiate the performance of candidates in a rigorous manner and avoid the tendency to submit groups of candidates on the same mark when there is a clear distinction in candidate performance. When rank order violations cannot be resolved by moderators the work is sent back to the Head of Centre with a request that the matter is resolved.

The ethos of the new specification is now becoming well understood by the majority of Centres, in particular the need for 'real time digital images' and 'interactive dialogue' where real products and design developments are shown in real time and the views of others are sought and recorded as they happen. Those submitting work on CD in the form of PowerPoint presentations are able to use videos and sound bites to very good effect and some outstanding communication skills are evident. It is absolutely essential in these circumstances to use 'The package for CD'/'Pack and go' save option when in PowerPoint to ensure that all videos and sound bites are correctly embedded in presentations. Centres are urged to try out all CD's on a stand-alone Windows laptop in a PowerPoint format capable of being viewed with a system circa 2003. This is the OCR standard and failure to ensure this could mean that moderators do not see what the candidate intended.

CD presentations are the OCR preferred option –this has an academic rationale as it makes 'real time' recording possible in a format, which is informative, and often inspiring; we advise that Centres move towards this format as soon as they feel able.

OCR do appreciate that some Centres face logistical problems and that e-portfolios are at present not an option. The full range of marks can be accessed by candidates submitting A3 paper portfolios. Many Centres have developed a successful strategy for presenting real-time digital images and associated 'interactive dialogue' by adding real time comments by third parties either directly onto A3 sheets , 'post it' stickers or on overlay sheets. Whichever presentation format is used candidates need to be made aware that there is a mandatory requirement to present evidence in real time and that the opinions of others should be obtained and essentially, recorded as it actually happens, in real time.

Section by section guidance on Product Study requirements for Unit F522
This product study should take candidates 30 hours to earn up to 120 marks.
1 hours work is notionally 4 marks)
OCR recommended A3/PP allocations are indicated for each section

Product focus and analysis (8 marks 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.

This January Moderators reported that:

- 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.
- Key criteria are often missing or completed poorly.

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.

This January Moderators reported that:

- 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.

- Some Centres introducing video to this section, which enhances the work.
- 'Old table' format still being used by some Centres.

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 poor in some cases and moderators are making reductions. Marks in the top band are not awarded in many cases. Centres may wish to consider inviting staff from 'critical thinking' departments to facilitate discussions or inviting in visiting speakers.

This January Moderators reported that:

- Many Centres are not presenting a good response to this section and are content to award marks in the middle band for average responses.
- In some cases where top band marks are inappropriately awarded it can have the effect of moving the whole Centre out of tolerance.

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.

This January Moderators reported that:

- 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 development 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 many Centres found this difficult. For the last two 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 new 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.

- *For the new 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.*

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 moderators 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. Zero for the specification automatically results in zero for the evaluation against it.

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.

- For the new 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.

This January Moderators reported that:

- '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 marks 2 x A3/PP)

There is no requirement to make a test rig – but candidates can if they want to! 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 test 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 emphasizing 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.

This January Moderators reported that:

- 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 Power-point in this section.

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 marks 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.

This January Moderators reported that:

- 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)

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 be encouraged not to 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 design. Many candidates try to avoid this issue.

- For the new 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 that show positive response to opinions from others. Overlay sheets could provide an opportunity for comment without affecting the quality of candidate presentation.
- 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 which cannot be accessed with the equipment most moderators use. It is absolutely essential that all individual CD's are trialled on an independent XP 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 iPods, iTunes, and mobile phones if they are not compatible with a standard PP presentation. OCR has measures in place to view non-standard files –This does however take up a disproportionate amount of time and success is not guaranteed.

This January Moderators reported that:

- 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.

Summary of Main features for Unit F522

- 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.
- 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.
- A 'real time' digital image of the product in use will be an essential feature.
- 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.
- 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 the new 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 which suits the development of improvement for their selected product.
- 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 now include the use of digital technology, and interactive dialogue candidates who fail to use these techniques should be marked in the lower bands.

F523 Design, Make and Evaluate

General Comments

Most Centres submitted their marks to the Moderator using the correct forms, although Moderators needed to contact several Centres after the due date in order to obtain MS1 forms, CCS 160 Centre Authentication forms, or the coursework itself.

There was only a small entry in this session. This was the first January session for this Unit, and all entries were candidates resubmitting coursework from the June 2010 session. In some cases it was evident that considerable 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.

The grid provided as part of the CSF form for Centres to provide a breakdown of marks from the 57 available in Section 4a was completed and forwarded to the Moderator in the majority of cases. The use of the grid was not a requirement, but it did assist the Moderation process where sent.

Some projects, often because of their size, were incomplete or not finished to an appropriate level of detail and quality. It was pleasing, however, to see focused and sensibly scaled projects on the whole.

In a several 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.

There was limited reference to the commercial and marketing aspects of design and manufacture throughout the project, although there was greater reference to the needs of the client or specific target audience.

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

Highly developed skills in a wide range of applications using ICT, CAD and CAM were seen, and Moderators noted the professional standard of work presented by some candidates. 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.

Approximately one third of the candidates entered for this Unit used PowerPoint software to record and present their coursework as an electronic portfolio.

Further guidance for all Units of this Specification will be given at the OCR Training Courses during 2011-12. Visit www.ocr.org.uk/training for more details.

Comments on Individual Sections

1) DESIGN BRIEF (3 marks)

Present a design brief for a marketable product
It is important for the candidate to look beyond their personal needs to the needs of a specific client or user group, and beyond this to the appropriate issues relating to commercial production and the marketing of their product. Marketing is specifically mentioned in the assessment objective for this section, yet candidates made limited reference to the aspects of the design of their product that would need to be considered from a marketing perspective, or give reasons why their brief was likely to produce a marketable product. Centres' assessments in this section tended to be lenient when compared with the OCR standard.

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
The highest achieving candidates in this section had researched using a range of techniques and both primary and secondary sources. They had then used this section to develop their understanding of the issues that needed to be addressed or carried forward into the designing. The purpose of this section is to enable the compiling of a detailed list of requirements and features for the product in the following section, the Design Specification.

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. Looking closely in person at a small number of items is of significantly higher value than studying a large number of items at a distance, both in terms of the useful information that will be gained and the marks that can be awarded.

Key data such as details and dimensions of items to be stored or fitted into the product, or details of the intended location for the product, or the legal guidelines or regulations which apply to their product, was often missing completely. This is key information – the restrictions, limitations, and boundaries imposed on the design of the product.

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 (e.g. 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. Centres' assessments in this section tended to be lenient when compared with the OCR standard.

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 complexity, demand, and intellectual challenge involved in the designing and making will influence marks in this section.

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.

Some candidates made contact with their client/target user group whilst working in this section, and in so doing were able to justify decision making more clearly.

In some cases Centres had awarded marks in the higher band in this section where the designing and making tasks were not sufficiently demanding at A2 level. Products varied from those that were highly imaginative and of a professional quality and finish, showing real flair and creativity, to those that were more appropriate to GCSE coursework. In many cases, Centres' marking in this section was lenient when compared with OCR benchmarking and standardising examples.

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

On the whole, 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.

There was a considerable difference in intellectual demand between projects. Candidates choosing very simple products with little complexity must be aware that considerable design exploration and detail will be needed if their work is to achieve high marks. Greater attention to technical aspects would improve candidates' performance, as would consideration of marketing aspects such as packaging, along with wider consideration of commercial and manufacturing issues.

- **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 poor in some cases.

- **experimenting and modelling**

Candidates used experimentation, trials, visualisations and simulations in an integrated way to test and exploring new possibilities, aiding the development and refinement of the design
A variety of modelling materials were used appropriately, and laser cutting and engraving CAM equipment was widely used to produce a range of models. Photographic evidence in this section was generally poor, with blurred images in some folios.
Centres' assessments in this section tended to be lenient when compared with the OCR standard.

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

Where the grid for this section was completed, the competency of candidates was often over-rewarded. In a number of cases there was no definition of the final design solution. For high marks, a clearly defined final design is required, which, if it was sent to a distant manufacturer, would enable that manufacturer to produce the item exactly as intended. CAD working drawings with supporting annotation are appropriate. Whilst some responses were to a high standard of detail and complexity, CAD drawings were most often incomplete and lacked the detail that would have enabled a third party to manufacture the product. In such cases, a mark in the lower or middle band is appropriate.

In general, Centres' assessments in this section tended to be lenient when compared with the OCR standard.

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

Most candidates included evidence of planning but often this was 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. On the whole, Centre's assessments in this section tended to be lenient when compared with the OCR standard.

When marking candidates' work, a carefully considered judgement is required as to the level of skill that has been involved. Relatively simple making tasks – which have been completed with minimal planning and setting up, and a basic knowledge and understanding – should be awarded lower marks than more complex making tasks which have involved many stages of preparation and planning, detailed setting up, and a more advanced understanding and knowledge of the materials and processes involved.

4b) INNOVATION (15 marks)

Show innovation

In general, candidates had explored and incorporated innovative features into their designing and making. It was pleasing to see originality, creativity and design flair and to reward this appropriately. Often an unusual means of manufacture will contribute to the marks, as would a product from a candidate who has taken a well-established design and re-ordered aspects of its design and making. Often a single innovative aspect, component, or method can demonstrate innovation.

In the majority of cases, the Moderator was in broad agreement with the Centre's assessments, although in some cases the Moderator had difficulty finding evidence to support the Centre's high marks where a conventional design had been produced using conventional techniques.

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

Sections 5, 6 and 7 follow the making of the product. They account for 27.5% of the total marks for this Unit. In many cases it was evident by the quality of responses compared to earlier sections that candidates had left insufficient time to complete these three final sections adequately.

Three elements are required in candidates' responses if they are to satisfy the assessment objective. For the highest mark to be awarded, all three elements need to be covered thoroughly and in depth. In some cases the Moderator was unable to confirm the maximum marks awarded by the Centre where candidates had not clearly stated strengths and weaknesses or responded to comments from an independent source. In some cases, no reference at all was made to the Design Specification.

There were few diagrams or drawings of possible improvements. Photographic evidence was lacking in some cases. Overall the responses by candidates to comments made by others and to the results of testing were disappointing.

Centres' assessments in this section tended to be lenient when compared with the OCR standard.

6) MARKETING PRESENTATION (15 marks)

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

This section represents 12.5% of the total marks for this Unit, yet often suffered as a result of insufficient time following the making work. There were some excellent responses with candidates producing detailed discussions of marketing strategies and worked-through examples of advertisements or marketing presentations for their product. These sometimes included videos or PowerPoint presentations showing the product in action.

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

Three elements are required in candidates' responses if they are to satisfy the assessment objective. For the highest mark to be awarded, all three elements need to be covered thoroughly and in depth. In some cases the Moderator was unable to confirm high marks awarded by the Centre where candidates had not considered the possible wider implications and impact of the product or suggested possible future developments.

There was a tendency for the *'review of the effectiveness of the designing and making process'* to be unrealistically positive rather than an honest appraisal of the project as a whole. Centres' assessments in this section tended to be lenient when compared with the OCR standard.

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

(Reference should be made to the published mark scheme for this unit when reading this report.)

A relatively low number of candidates sat this paper in the January session.

The most popular question was Question 6 Resistant Materials followed by Question 4 Graphic Products and Question 5 Manufacturing. There were a very small number of entries for the other five questions.

Some candidates attempted more than one question. This restricts the amount of time they will spend on the F524/02 paper and consequently impacts upon the overall result.

Parts (a), (b), (c) and (d) 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 general requirements or brief, simplistic and unjustified statements, which did not receive a mark.

Some candidates answered part (a) with a list of questions, which received no marks, rather than stating justified design requirements for the product.

Many candidates achieved high marks for part (b). Whilst most candidates gained credit for describing two ways in which CAD could be used in the designing of the given product, a number failed to gain marks by stating the benefits of CAD with no reference to the product.

Part (c) was generally well answered. Most candidates focussed on the disadvantages of high initial set-up and training costs for computerised stock control and the damage caused by breakdowns of the system.

Very few candidates achieved full marks for part (d). Many candidates wrongly interpreted 'Intellectual property' as the ability for materials to behave intellectually as in the case of smart materials.

The best responses referred to the ownership of creative ideas and outcomes giving copyright, trademarks and patents as examples.

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 and for Question 7; few candidates were able to produce a diagram to show how a DC motor could be used along with other components to pump air under pressure into a tyre.

With the exception of Question 7 Systems & Control, part (e) (ii) of F 524/01 included 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.

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

The mark scheme for part (f) has been amended to fit into a 'best fit ' assessment banding. Details what is required for a Level 3 (6-8 marks) is shown below.

Clear, cogent and well-structured response with two or three issues well explained.

Good use of examples and additional evidence to support discussion.

Good use of technical vocabulary.

There was a wide range of responses to part (f). Some candidates gave very brief responses, repeating the same issue relating to the basic testing of products and not considering the implications.

The best responses focused on key issues such as safety, functionality and reliability of the product. Candidates went on to explain the implications to manufacturers and/or consumers using relevant examples to support their case.

A number of candidates missed out on achieving full marks by not including additional evidence or examples 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

Too few questions were seen to make general comments.

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. Although aluminium was accepted as an appropriate material for (e) (i), aluminium alloy would be more appropriate.

Most candidates correctly identified a specific material and gave two appropriate properties. Some candidates used a combination of a flowchart with annotated diagrams to reasonable descriptions of the process to manufacture the connector. Not all candidates included details of quality control checks.

Answers to part (f) were generally brief and lacking detail.

Question 3 Food

Too few questions were seen to make general comments.

Question 4 Graphic Products

Most candidates stated foil laminated board as an appropriate material and gave appropriate properties and characteristics.

Whilst there were a number of excellent 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 printing, cutting and folding of the carton. Some candidates did not take into account the volume of production.

Most responses to part (f) focused on issues related to the testing for functionality of graphic products, user testing and consumer feedback.

Question 5 Manufacturing

This was a popular question with some excellent responses. Almost all candidates identified an appropriate material with appropriate properties 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). Candidates produced detailed flow charts (including appropriate sketches) of the manufacture of the leg. Most candidates included quality control checks.

Legal responsibilities, cost and safety were the main issues discussed in part (f)

The best responses discussed these issues in detail, making clear reference to the implications of testing to the manufacturer and consumer.

Question 6 Resistant Materials

Thus was the most popular question with a wide range of responses. Most candidates opted for part B (the frame). There was a wide range of materials proposed for (e) (i), the most common being aluminium, stainless steel and laminated or steam bent hardwood (beech, birch or maple). Most candidates gave two appropriate properties,

Some responses to (e) (ii) were outstanding; fully detailed methods describing the production of a batch of 50 frames and including details of the jigs and formers required.

Some candidates described methods, eg. injection moulding, that would not be appropriate for a batch of 50.

There were some excellent responses to (e)(ii) from candidates who selected part A,the shade. They included details of appropriate formers to create 50 shades and included the accurate positioning of both holes to be drilled.

Many candidates produced very good responses to part (f); a number achieving full marks. Most candidates focussed on issues such as PR and legal implications of faulty and/or unsafe products and the initial cost implications.

A number of candidates focussed on a single issue related to testing, ignored the implications and consequently did not access the middle or higher mark bands.

Question 7 Systems and Control

Too few questions were seen to make general comments.

Question 8 Textiles

Very few candidates attempted this question.

Most were able to identify an appropriate fabric for the dungarees and were able to give appropriate performance characteristics for part (e) (i).

Many responses to part (e) (ii) were full and detailed and were a combination of flowchart and annotated diagrams.

Answers to part (f) were generally good. Some candidates produced good responses, focussing on safety and legal implications. Some candidates did not give relevant examples or supporting evidence to support their answers and consequently could not access the higher mark band.

F524/02 Component 2

General Comments

(Reference should be made to the published generic mark scheme for this unit when reading this report.)

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.

Unfortunately many candidates lost 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. Factors such as these are relevant to *all* products so to be given credit in this section they must be carefully justified indicating more precisely how each would influence the design of the specific product to be designed.

In future 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 well done by some candidates who considered how the product would be used and manufactured and drew attention to both positive and negative aspects of their designs.

Unfortunately in many cases comments were summative rather than evaluative taking the form of simple statements that do not show any consideration of strengths and weaknesses.

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: Cycle storage area (Built Environment and construction)

Too few questions were seen to make general comments.

Question Two: Projector stand (Engineering)

Too few questions were seen to make general comments.

Question Three: Food product for the elderly (Food)

Too few questions were seen to make general comments.

Question Four: Drinks packaging (Graphic Products)

Although some excellent responses were seen to this question, combining fluent graphical skills with sound technical knowledge, many candidates found it difficult to propose ideas significantly different to those we see every day. Whilst credit can be given for developments based on established concepts candidates are encouraged to 'think outside the box' wherever possible.

Question Five: Play equipment (Manufacturing)

This question allowed candidates to produce a wide variety of design concepts, although most candidates did focus on a single type of product. Although most made clear reference to the need for the play equipment to dismantle in some way, many proposed unrealistic methods of connection (for example magnets) for components designed for vigorous play.

Question Six: Examination seat and desk (Resistant Materials)

This was a popular question with some excellent detailed responses. A significant number of candidates failed to recognise the requirement for the seat and desk to be 'integrated', simply designing folding tables and chairs as independent items. Errors such as this are penalised in the marking of '**R**ange of ideas'.

Question Seven: Illuminated warning device (Systems and Control)

Too few questions were seen to make general comments.

Question Eight: Cycling jacket (Textiles)

Too few questions were seen to make general comments.

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