GCE EXAMINERS' REPORTS

GCE
DESIGN AND TECHNOLOGY
ENGINEERING DESIGN / FASHION AND TEXTILES / PRODUCT DESIGN
AS/Advanced

SUMMER 2022

Grade boundary information for this subject is available on the WJEC public website at: https://www.wjecservices.co.uk/MarkToUMS/default.aspx?l=en

Online Results Analysis

WJEC provides information to examination centres via the WJEC secure website. This is restricted to centre staff only. Access is granted to centre staff by the Examinations Officer at the centre.

Annual Statistical Report

The annual Statistical Report (issued in the second half of the Autumn Term) gives overall outcomes of all examinations administered by WJEC.

ENGINEERING DESIGN

General Certificate of Education

Summer 2022

Advanced Subsidiary/Advanced

UNIT 1: WRITTEN PAPER

General Comments

The examination was taken by a small number of candidates and it was again disappointing to note that numbers had not increased on previous years. Evidence suggested that candidates had not prepared for the examination in the depth that might be anticipated. Technical knowledge and understanding of both mechanical and electronic systems appeared to be very superficial and the ability to communicate ideas through graphic illustration was very limited.

Questions that were most accessible to candidates did not require specific technical knowledge.

In future candidates should learn how to draw circuit diagrams and mechanical systems using recognised conventions. Failure to provide analytical answers to a number of questions also restricted achievement.

Comments on individual questions/sections

Q.1 (a) Very few candidates understood how an AND gate can be used to control an output. As a result, circuit diagrams were underdeveloped and lacked technical detail.

(b) Few if any candidates were able to explain valid reasons for using chips that contain NAND gates in preference to others.

(c) Those that understood logic systems and truth tables were able to gain marks for this part of the question.

Q.2 (a) In general candidates were unable to demonstrate the in-depth understanding of mechanical systems that is anticipated at this level. Most were able to make a relationship between the velocity of gear A and B but were unable to develop this in answering the question.

(b) The quality of sketching in answering this section was limited and, in most cases, lacked technical detail. The majority of candidates that did obtain marks provided an answer that was dependent on bolts being tightened onto a threaded shaft. The is not very effective and warranted half marks or less.

Q.3 Although many candidates had an understanding of reverse engineering very few were able to explain how this has been beneficial to iterative development. None of those who had completed the paper were able to score more than half marks. Little if any creditable reference was made to the benefits of morphological analysis.

Q.4 Most candidates had an understanding of Computer Aided Design and Computer Aided Manufacture but were unable to explain how these processes would be beneficial to the production of bespoke custom-made products. Some credit was given to those candidates who discussed the opportunities to make changes to the product prior to production.

Q.5 Responses to this question were very disappointing. Candidates in general did not understand how piezoelectric transducers are being used to improve the performance of interactive products. In many cases the answers did little more than reflect on the terminology used in the question.

Q.6 (a) Most candidates were able to provide a response to this question which demonstrated some understanding of the needs of a potential consumer. Those that were able to provide an analytical response achieved higher marks.

(b) Attempts to sketch mechanical systems were very limited and candidates had not been well prepared to answer this question. Very few marks were awarded for the selection of materials as choices tended to be generic and lacked justifiable reasoning.

(c) Only one candidate was able to access the full range of marks for this question. In general evidence suggested that the understanding of electronic systems was very limited. Many candidates were unable to draw components using recognized conventions and did not appreciate the need to use a relay as an interface.

(d) This part of the question required little technical understanding and some candidates were able to discuss improvements that could be made for people with more sever disability. Answers tended to focus on issues related to access and voice recognition.

FASHION AND TEXTILES

General Certificate of Education

Summer 2022

Advanced Subsidiary/Advanced

UNIT 1: WRITTEN PAPER

General Comments

The overall response to this paper was well received with many pupils demonstrating the in-depth technical knowledge and understanding that is required at this level. In some cases, it was evident that candidates had not prepared thoroughly for the examination and in the depth that might be expected. Some lacked the technical knowledge and understanding that would have enabled them to respond at a higher level. Virtually all candidates attempted all questions, with very few blank spaces, indicating that candidates had managed the time period effectively.

There are useful resources available when analysing candidate performance in this unit, particularly the Item Level Data which is centre specific and allows a full statistical breakdown of candidate performance question by question. Centres can also compare their performance against ALL centres to identify strengths and weaknesses in delivery of this specification. The Online Examination Review (OER) is also available via the WJEC website. This e-resource contains marked exemplar responses from scripts, where examiners marks are available, together with marking criteria and reasons why marks have been awarded and where responses lack the depth to access further marks. This is a powerful teaching tool for classroom activity with candidates. Useful teaching resources to support learners in the classroom are also available via the WJEC website in the resource section. Here you will find knowledge organisers and interactive teaching resources.

Comments on individual questions/sections

Q.1 This question was well answered and was considered very accessible with most candidates achieving high marks.

(a) Generally, well answered. Almost all candidates were able to define the term ‘reverse engineering / disassembly’.

(b) This question was answered well by almost all candidates. Candidates showed good understanding and were able to describe the benefits to the designer.

(c) Candidates were able to give other forms of research and in most cases their descriptions were detailed. In a few cases, candidates gave alternative forms of research but did not expand further.

Q.2 Responses to this question were positive overall and accessible for most candidates.

(a) Candidates were able to answer this question by giving answers such as; performs its function, fulfils its purpose and to ensure it works. This demonstrated their knowledge of a design specification.

(b) All candidates were able to give examples of measurable performance criteria and in most cases justified the importance of each example.

Q.3 Most candidates scored well on this question.

(a) Candidates were able to sketch a basic cross section of linen fibre. Some were able to annotate to explain how the linen fibre is able to absorb moisture.

(b) All candidates showed knowledge of linen and were able to give examples of its uses in the answer.

Q.4 Most candidates gave this question a go, but they failed to address the exact requirements of the question.

Many candidates did not show in-depth understanding of staple and filament fibres. Most candidates were able to describe the look of each fibre, which was taken from the images that were given on the paper. Candidates demonstrated a lack of understanding. They were not able to discuss how the type of fibre / yarn affects the fabric.

Q.5 It was evident that many candidates failed to score well in this question.

Candidates were not able to fully answer this question. Candidates did not know the meaning of 'iterative design'. Marks were awarded to candidates who included iterative design examples when talking about the design process. Most candidates answered this question with a linear design process in mind.

Q.6 Responses to this question were positive overall and accessible for most candidates on the whole.

(a) This question was answered poorly by candidates on the whole. Candidates gave superficial reasons for how iconic designs have developed over time. Most candidates were not able to access higher marks.

(b) (i), (ii), (iii),(iv) All candidates were able to show front and back views of a two-piece matching suit. It was clear to see that the mood board was used as inspiration for their designs. Candidates were creative in their design idea on the whole, and this was pleasing to see. Some lacked creativity and their ideas took the form of very basic line drawings. Annotation and communication varied. Some annotation was detailed and included named style details as well as construction notes and exploded drawings. These candidates were awarded the higher marks.

(c) (i) Candidates demonstrated their knowledge of wool tweed. They were able to explain the properties of wool tweed and relate the properties to its uses.

(ii) Most candidates showed knowledge of a plain and twill weave and were able to explain how each weave determined the design and characteristics of the fabric.

(d) Candidates demonstrated good knowledge of viscose and the suitability of viscose as a lining. Answers showed subject knowledge and application.

Summary of key points

General weaknesses in candidate performance include:

- Failure to develop a detailed response in order to gain the higher marks;
- Weakness in specific textile related knowledge in some areas;
- Failure to 'explain. 'An 'explanation' requires a fact and an elaboration of that fact;
- Well-planned and structured responses score well. These responses contain clear, and specific details relating to the question. A number of candidates' responses require more structure and planning in order to organise information clearly and coherently and attain higher marks.

PRODUCT DESIGN

General Certificate of Education

Summer 2022

Advanced Subsidiary/Advanced

UNIT 1: WRITTEN PAPER

General Comments

Given the circumstances of this year's examination the paper was well received by candidates and centres. In general candidate's responses were good however, the impact of the previous two years was evident in the general quality of response. In some responses candidates did not demonstrate the depth of technical knowledge or technical detail required at this level.

As the content of the specification and the structure of the questions become more familiar to centres it is assumed that the responses of the candidates will access the higher marks. The format of this paper remained consistent with the sample assessment material that has been available on the WJEC website and the past papers; **however**, centres would be advised that this can change in future.

Comments on individual questions/sections

Q.1 All candidates attempted this question. With 4.3 the average mark attained and a Facility Factor of 53.6.

(a) This first question was attempted by all candidates and was in many instances well answered. However, it is clear that some basic material knowledge is lacking, example, a number of responses stating that mild steel resists corrosion.

(b) This question was generally well received with a range of responses. Many candidates were able to give full and detailed responses relating to the weather proofing and aesthetic properties of galvanising. Some responses supplied more detail then required for the marks available.

(c) This question was generally poorly answered and reflect limited preparation by some candidates. Suitable responses would have referred to: Rivets, Welding, Brazing, friction welding and an appropriate diagram and notes for explanation. Responses that referred to a suitable method were appropriately rewarded. However, many candidate's simple guessed at an answer and these responses included: Hot glue guns, Screws and Nut and bolt. Supporting diagrams in this response tended to be weak.

Q.2 99% of candidates attempted this question. The average mark was 3.5 and a Facility Factor of 44.1. A small number of candidates did not attempt this question.

(a) The majority of responses were able to explain the term but a significant number of candidates lacked detailed explanations or confused stock forms with stock items. Many responses simply stating that Stock items were readily available. Many good responses referred to specific stock sizes of materials i.e. plywood sheets thus fully supporting their response. Some responses supplied more detail then required for the marks available.

(b) Responses to this question were good in many cases. However, candidates who lost marks were simply not able to identify the advantages for both the designer and manufacturer. In these instances, the response just repeated the advantages for both and did not refer to any specific benefit that was relevant to either the designer or the manufacturer. A list describing in detail benefits for both the designer and manufacturer would have been appropriate in this answer.

Q.3 98.8% of candidates attempted this question. The average mark was 4.2 and a Facility Factor of 52.6.

A small number of candidates did not attempt this question. The majority of responses were able to describe both strategies' and identify their importance in the iterative design process. However, many responses highlighted confusions regarding the application of either reverse engineering or product analysis with many responses using them as interchangeable, not identifying the specific information that could be gleaned from either strategy.

Stronger responses were able to link these strategies' to 'above / below the line' and the different information that could be harvested from either strategy. Again, some responses used list structure describing in detail benefits the use of the two strategies and this would have been appropriate in this answer.

Q.4 99.4% of candidates attempted this question. Thea average mark was 4.7 and a Facility Factor of 59.3.

A small number of candidates did not attempt this question; however, this was a very accessible question for the candidates.

In this question the QWC (quality of written communication) was assessed and some candidates did not respond in the appropriate manner providing a GCSE type list of benefits of polymers, in a few cases this was a bullet point list, this will have prevented them accessing the higher mark boundaries. The essay type response required by this question posed the greatest challenge to some candidates and is an area that with thorough preparation will easily allow them to improve their marks.

The majority of candidates were able to explain the benefits and drawbacks of polymers but very few made use of the image which provided valuable information for them. The majority of candidates who lost marks on this question did not provide a simple concluding statement. Candidates must be remined that additional space for expanding their response is available on the continuation pages.

Q.5 100% of candidates attempted this question. Thea average mark was 3.8 and a Facility Factor of 47.6.

(a) This first question was attempted by all candidates and was generally well answered. Almost all candidates were able to identify with reasons the selection of a suitable process to manufacture the end piece.

(b) This question received a wide range of responses. A surprisingly significant number of candidates displayed little or no understanding of a basic forming process. Many responses confused the manufacturing with forming and explained how the whole storage unit is manufactured rather than how the body is formed, in these cases the forming of the body was not mentioned. Many candidate responses displayed an appropriate level of detail and understanding referring to the use of a mould / former, glue, pressure and time. In many cases a good response was supported by clear diagrams and notes. At the higher end responses were detailed and well presented with clear, well annotated supporting sketches / diagrams.

(c) This question was attempted by all candidates and with marks easily attained in many cases, however a few candidates were confused between plywood properties and characteristics.

Q.6 A design-based question. 100% of candidates attempted this question. Thea average mark was 23.8 and a Facility Factor of 59.5.

(a) This question was generally well answered by a majority of candidates. Many candidates were clearly able to identify the key issues surrounding the use of portable BBQs and linked them to the images supplied. Many responses were also expanding the answer to discuss ease of use and simplicity of single use BBQs and the impact they have upon the environment in the context of both materials and manufacturing. Some responses provided much more information than was required for the marks available. Many candidates attained high marks in this question.

(b) (i) The verity of response was impressive and highlights that creativity remains a strength in this subject. Many responses demonstrated a range of simple yet appropriate innovations. The weaker design solutions did not demonstrate the anticipated level of analysis of the situation and resultant innovative proposals and in many cases appeared to be rushed.

(ii) Two justified issues were expected in this response and many solutions indicated a good response to this question, notes including possible materials, shapes and forms of the unit all demonstrated a clear understanding of this requirement.

(iii) Two justified answers were expected in this response; however, many responses were only able to justify one safety requirement. This resulted in lower marks in this question.

(iv) There was greater continuity in response with this question. Almost all responses highlighted a simple use of sketches to display their ideas, very few responses demonstrated candidates spending time colouring or shading their drawings. However, the quality of simple sketching and supporting notes varied significantly with a disappointing number of candidates presenting poor 2D or 3D drawings with little or no supporting annotation and in a few responses only 2D drawings were presented. Candidate would be encouraged to spend time during the course developing and practising this skill.

(c) (i) This question was attempted by all candidates and generally well answered. Responses often had two reasons for the use of a prototype however, a few responses lacked the detailed reasoning expected at this level.

(ii) This question was attempted by all candidates many responses demonstrated a basic understanding of the advantages and disadvantages of global trade and manufacture, however a lot of respondents did not link their answers to either consumer or manufacturer and were consequently generic in nature. Higher marks were attained where the candidate was able to clearly identify benefits and disadvantages of this system and link it to either consumer or manufacturer and place it in an appropriate context e.g. working conditions in a factory will only become an issue for the manufacturer if the conscience of the consumer influences their purchasing.

Summary of key points

- Candidates should be advised to read the question carefully in order to ensure that all elements are understood and are also included in their response.
- There were a number of examples where the responses throughout were not detailed enough to gain the higher level of marks.
- Centres should continue to advise candidates to use the mark allocation indicated at the end of each question to guide the depth of response required and manage time effectively, there were many examples of candidates providing too much information for the question.
- Allocate time appropriately, e.g. Q6 the design question is worth 50% of the marks, this question should take 50-55 mins of the candidate's time.
- Well-planned and structured responses score well. In many cases if candidates spend time organising their response this will ensure that the questions are fully answered and allow them to improve their mark.
- Question 4 responses varied considerably; responses generally require more structure and planning, whilst ensuring that **ALL** elements of the question are covered. Centres are reminded that this type of question requires an essay style response. Majority of candidates were able to identify benefits and drawbacks of polymers but very few discussed them in the context of the products included in the image.
- Centres should also be advised to remind candidates that answers could be amplified with detailed labelled sketches and / or diagrams where appropriate; many of the answers were unfortunately brief with a few words and simple sketches not allowing the candidate to fully explain the response and display the depth of knowledge required at this AS level.

ENGINEERING DESIGN / FASHION AND TEXTILES / PRODUCT DESIGN

General Certificate of Education

Summer 2022

Advanced Subsidiary/Advanced

UNIT 2: DESIGN AND MAKE TASK (NEA)

General Comments

This was the first time since the 2019 that moderation visits had taken place, after what has been a very difficult and challenging time in education for both pupils and staff. It was a pleasure once again to be able to see candidate creativity and innovation. Most centres adapted well and followed the WJEC adaptations but not all. Close reference to exam board adaptations are required in the future if anything else nationally disrupts education. Some centres manged to present the NEA as if there had been no disruptions at all. These centres must be commended for enabling the candidates to have such a complete learning experience. All centres must remember that for this subject specification the NEA needs to follow an iterative design process, where the candidate themselves can almost determine the direction of the project. In general, the majority of centres applied the assessment criteria consistently and fairly, but close scrutiny is required to the mark bands if high or full marks are to be awarded.

Comments on individual questions/sections

AO1 Identifying and investigating design possibilities

The assessment criteria clearly demands that candidates identify a broad range of problems/opportunities to clearly inform the development of possible design briefs. This was not the case in all centres. Care is needed here to ensure that access to the higher mark bands is possible, because with only limited very focused research, access to the higher bands is not possible. Candidates must be encouraged to undertake wide ranging research and investigation into a number of possibilities. Candidates need to be encouraged to use a variety of different design strategies during this section.

AO1 Developing a design brief and specification

There should be clear evidence within the project showing how the design brief and design specification has been arrived at, and a thorough understanding and requirements of the task ahead. Many centres produced design specifications with sufficient details required, but not all. This had been highlighted last time, and needs to be addressed if higher marks are to be awarded. The design specification needs to be specific and detailed and include a range of objective and measurable criteria. The design specification needs to direct and inform the designer whilst developing the design. Care is needed not to produce superficial specification points which do not contain measurable criterion and lack any depth. A quality in depth design specification will also help greatly when evaluating the product. It must be remembered that specifications are working documents and should be referred to throughout the iterative process. To become more of a valuable working document a suggestion could be to produce a draft specification which can then be adapted as and when certain points needed to be during the development of the product before arriving at the final design specification.

AO2 Generating and developing design ideas

Some candidates had fully embraced the iterative design approach with some exceptionally high-quality work being produced throughout this section. This is where thorough use of relevant modelling and testing of ideas, driven by the design specification can support decision making and move the project forward. Those candidates who had done this extensively gained valuable information and feedback prior to making their final prototype. Research of different findings and possibilities can also be included here, to aid once again with the iterative design process. Centres need to continue to encourage candidates to develop this iterative process as much as possible and to always remember to record their findings in some way. Saying that, not all candidates work should follow exactly the same format, as the project should be driven by their findings. For the iterative process to be of value candidates need to be encouraged to model, develop, test and evaluate as much as possible throughout the development stage. This could include simple sketch 3D models, more accurate physical models, test model / rigs and 3D CAD modelling. This is an excellent method for the candidates to gain an understanding of their project and for evidence of their iterative journey.

AO2 Manufacturing a prototype

Prototypes made this year were appropriate considering the adaptations put in place, with a real variety of final outcomes from different centres. Several centres had managed to complete quality fully functioning prototypes whilst others had presented a functioning model. The results seen throughout were very pleasing after the difficulties over recent years. It must be remembered that evidence of a logical sequence and achievable timeline for the stages of production is required in this section if higher mark band marks are to be awarded. This was particularly important this year if a model was presented as the final product. Some excellent making skills were witnessed but the standards of manufacture varied greatly as did the application of the assessment criteria. For next year, as we return to the full normal subject specification requirement, if top mark band marks are to be awarded the product needs to be a high-quality functioning prototype, displaying very good attention to detail with a quality finish.

AO3 Analysing and evaluating design decisions and prototypes

Many of the summative evaluations were generally well written, and considered the design brief and specification, and considered views of users and referenced end testing. A quality design specification with good measurable qualitative and quantitative criteria enabled the candidates to produce a more meaningful final summative evaluation. This was not the case for all, with them presenting brief superficial evaluative points being covered at the end of the project. Most candidates had included reflective commentary as an on-going process throughout their projects. This is very important and can be commended but the amount of detail of the ongoing evaluation could be enhanced to communicate the journey of the product. More end user trailing, and testing needs to be encouraged and then to communicate the further developments required to better meet the functional and / or aesthetic needs of the product. For this to happen care is needed to ensure that the candidates complete their prototypes in good time to allow the time for a comprehensive evaluation of the product to take place.

ENGINEERING DESIGN

General Certificate of Education

Summer 2022

Advanced Subsidiary/Advanced

UNIT 3: WRITTEN PAPER

General Comments

The entry for this specification remains a very small specialist cohort. There are a few centres who historically offer this course as a progression from GCSE. As the future demand for STEM based qualifications becomes more important over the coming years hopefully more candidates will undertake this qualification as it provides an exciting opportunity for candidates to develop new and existing skills that will be specific to careers in emerging technologies. With increasing national awareness of the importance of STEM subjects, and as candidate numbers increase, we will hopefully be able to establish better statistical patterns.

Comments on individual questions/sections

Q.1 The majority of candidates scored well on this question. Clearly most candidates were familiar with Reverse Engineering and the benefits that the activity entails.

Q.2 This question was generally well answered by most candidates. Most candidates were familiar with the required anthropometric data required to answer both values in (a) but there was some repetition of the responses for (b) whereby candidates simply repeated the same issues for both 1 and 2. For (c), most candidates were able to make good comparisons between the two different types of can openers, particularly in terms of the materials used, the production methods required and the disposal / re-use of both items.

Q.3 (a) (i) Was generally well answered but there were several candidates who could not identify breadboard modelling. Valuable marks were lost due to this, as the aforementioned knowledge was required for the continuation section (ii). For (b) (i), several candidates were unaware of what the term ‘bought-in’ PCB meant and this affected the quality of the responses. The overall responses to (b) (ii) were very poor with very few candidates being able to provide an explanation of the Darlington driver integrated circuit.

Q.4 This proved very accessible with most candidates gaining relatively high marks. The context was very familiar to most candidates with most having a clear understanding of the robot vacuum cleaner. For (c) most candidates were able to relate their knowledge of other, similar technological trends, and relate this to their responses.

Q.5 Candidates tended to struggle with this question and very few were able to identify a Class 1 Lever for (a). This had a knock-on effect for the explanation and valuable marks were lost here. For (b), very few candidates were familiar with how the forces were transmitted through the mechanical lifting aid and subsequently how these forces resulted in a shear force on the bolts. Some candidates were able to guess the results, but marks for this question were very low.

Q.6 This question proved to be accessible with many candidates achieving good marks. Most candidates were able to describe the importance of physical modelling and were well versed in the benefits and limitations of CAD.

Q.7 This question proved to be very difficult for most candidates. Few were able to identify Component A (a Light Dependent Resistor) and subsequently its function. Very few candidates were able to describe the events in the circuit (ii) that would enable the red light to illuminate. Most candidates were able to answer (iii) successfully. Very few candidates were able to answer (b) relating to the use of two 9V batteries.

Q.8 Most candidates were able to identify a suitable thermoplastic and to give appropriate properties for the material named. Valuable marks were lost for (ii) however as many candidates were unaware of the setting up and use of a laser cutter when faced with materials of different thicknesses. For section (b), very few candidates were able to identify the smart material (Quantum Tunnelling Composite) and were unable to gain marks for (b) (ii).

Q.9 This question was generally well received with most candidates being able to relate their responses to current devices such as an iPhone or an iPad. Many answers were, however, too descriptive and candidates failed to expand in terms of how the simplified interface was of a benefit to the user e.g. above the line features being very intuitive.

Q.10 This question was generally well answered with a good evaluation of how well targeted / designed objects can lead to better sales / profits. More marks could have been awarded, however for a more in-depth analysis on the impact of knowing the needs, wants and values of users. There was, for example, very little consideration on the importance of feedback provided to designers, cross-referencing during the design and development stages or testing to establish how products can meet the needs, wants and values of customers.

FASHION AND TEXTILES

General Certificate of Education

Summer 2022

Advanced Subsidiary/Advanced

UNIT 3: WRITTEN PAPER

General Comments

This current academic year sees the second award for the GCE A Level qualification in Fashion and Textiles. For this year only, it will stand alone as a qualification, with a 50:50 split between the NEA and examination. The number of entries is very low when compared to Product Design.

Questions were drawn from a broad cross section of topics listed in the full course specification. The style and demand of questions varied but effectively tested candidates' ability to demonstrate knowledge, understanding and skills acquired over the two-year period of study at GCE Level.

The style and structure of the questions meant that the paper was accessible to candidates who attempted almost all questions, however some of the questions towards the end of the paper which are set to test depth of knowledge and understanding proved very challenging for some candidates. The responses to these questions were often superficial, demonstrating a lack of knowledge or were poorly constructed; this could be down to a lack of examination practice and / or an indication of the impact the pandemic has had on learning. It is accepted that the last two years has been particularly difficult for candidates as they prepared for their A Level examination.

Centres are advised that each question is set in a context - a picture of a product for example or, an outline scenario is stated. Candidates should be encouraged to carefully consider the context of each question before attempting an answer.

Comments on individual questions/sections

Question 1

Q.1 Candidates demonstrated good subject knowledge; overall the question was answered well and considered accessible, with most achieving high marks.

(a) Most candidates understood the reasons the fancy dress outfit would be batch produced – it is a seasonal product (Halloween), it is also aimed at children, both factors imply a lower demand.

(b) (i) Cell production was less well known.

(ii) Candidates who understood the principle of cell production answered this well with most suggesting that it can lead to an increase in productivity.

Q.2 The responses to this question varied. Most answers were descriptive and lacked any form of reasoning within each response.

(a) (i) Most candidates understood what the designer would have considered for the function of the jacket i.e. needs to keep the user warm and dry but did not elaborate beyond this.

(ii) As aesthetics is a key consideration for products in the fashion and textile industry it was surprising that some answers failed to grasp the importance of this when referring to the design of the jacket. Typical answers included reference to using a nice colour but failed to expand on that. At GCE A Level it would be reasonable to expect all candidates to gain full marks for such a low tariff question.

(b) Responses to this varied but most candidates could **not** justify the cost of the jacket being set at £99.00. Most candidates described the features and materials listed but failed to expand further. This question was typical where candidates failed to consider the information given in sufficient depth before offering a response. Most candidates did not consider the correlation between the user's needs, the materials used and the expected performance of the jacket to justify the cost. The question was not about the manufacturer making a profit.

Q.3 Overall, the responses to this question were disappointing and either answered superficially and descriptive in nature or the topic was simply not known.

(a) Product A, the mini dress featured retro styling based on the iconic styles of the 1960s – shift dresses and the mini skirt. Many responses were descriptive but failed to go beyond that, thereby missing the whole point of the question. Full marks were rarely awarded.

(b) The question relied on candidates having some understanding of recent developments in fully integrated technology within textile fabrics – soft switches that rely on conductive threads in order to function or components parts that are sufficiently small or flexible enough to be embedded in textile products. The product shown is a CAD concept drawing illustrating the technological possibilities based on recent technology. Few candidates understood this consequently answers were often weak, superficial or descriptive.

(c) Most candidates did not know what morphological analysis is but understood it is a strategy for developing ideas. Some responses that referred to product analysis or disassembly were given credit, but technically this is incorrect.

Q.4 Candidate responses varied but overall were disappointing given that this question is about the iterative process of design that candidates would have experienced during the completion of their NEA.

(a) This question is about the quick generation of ideas to get initial concepts down on paper before ideas are forgotten – starting points for design. Few candidates scored well in what is a low tariff less demanding question. Responses lacked maturity.

(b) This question is about CAD modelling techniques to present ideas to clients. Most candidates missed this point and referred to CAD as being easier or quicker but failed to elaborate beyond that. At A Level, candidates are expected to demonstrate a clear, detailed and very specific body of knowledge in order to gain credit. Responses again lacked maturity and depth of knowledge. A few candidates referred to emailing designs to candidates; this was not what the question was about and did not gain credit.

(c) A minority of candidates did well on this part question but many missed the point that this question was about developing the '*dimensions*' for a product. I reiterate the need to read and consider the context carefully before attempting an answer.

Q.5 As has been the case at GCSE level for many years specific subject knowledge relating to materials is generally considered weak. For a few candidates this was clearly still the case.

(a) Responses varied but most candidates listed random properties that could relate to soy fabric but did not explain how these properties compare to cashmere or silk. Full marks were rarely awarded. Detailed knowledge and understanding was not evident.

(b) Soy fabric has specific properties that make it suitable for someone with sensitive skin for example, it contains amino acids which can be absorbed through the skin or it is anti-bacterial. Responses that indicated this level of detailed knowledge and understanding were rarely seen.

Q.6 The responses to this question were good overall with most candidates scoring reasonable marks.

(a) Most candidates suggested the fabric for the bag had been coated in some way but did not expand further i.e. with PVC or a PU coating. Most candidates did however fully explain the reasons for applying the finish.

(b) Most candidates knew how a brushed finish is achieved and why it is applied to fabrics used in clothing. A few candidates did not appear to know what a brushed finish is.

Q.7 Responses varied for this question. Overall, it proved challenging for most candidates; some parts were slightly more accessible than others.

(a) A simple response in explaining the term '*straight of grain'* is 'parallel to the selvedge edge'. Most candidates appeared to struggle constructing a simple description of the term.

(b) Most candidates suggested cutting the top on the bias would create problems with fit and possibly distort the shape whereas it could achieve the opposite. Generally, there was a lack of understanding regarding cutting on the bias.

(c) This part question proved too challenging for most candidates with very few being awarded high marks and a number of candidates did not attempt this part question. Lack of practical experience in the workshop in the last few years could have had an impact on this question.

Q.8 Responses varied for this question. Lack of subject knowledge was clearly evident in some responses.

(a) Most candidates demonstrated some understanding of the role of fashion forecasters in predicting future trends and were awarded marks accordingly. Where candidates failed to capitalise on the available marks was in explaining why designers rely on them.

(b) Answers to this question varied. Some candidates made reference to the planning stages they would have included within their NEA, which was given some credit but then failed to elaborate on how a critical path supports manufacturers in industry. Points made were not always fully explained consequently full marks were rarely awarded.

Q.9 This question was disappointing with very few candidates achieving high marks. Most candidates appeared familiar with the term 'dart' but not a 'princess line seam.' Both are very common style details used extensively in the garment construction. It is surprising that these technical terms were not better known. This question also addresses AO3 where candidates need to show evidence of appraisal or making judgements in their responses. Some answers tended to be descriptive consequently full marks could not be awarded.

Q.10 Overall, this question was the most accessible on the paper. Most candidates demonstrated very clear and detailed subject knowledge and expressed themselves with clarity with clear evidence of logical chains of reasoning in the second of the two AO3 questions. Quality of written communication which was assessed in this question was mostly considered good. Candidates understand the impact the fashion and textile industry has on the environment. Media coverage of fast fashion and environmental issues surrounding the textile industry has no doubt made an impact on candidates' knowledge and understanding strengthening their ability to answer this question. That said candidates should be mindful that over long responses that stray away from the main focus of the question do not necessarily yield higher marks. Most candidates had a better understanding of how designers could reduce waste and pollution levels and for most this was the focus of their responses. Less well known are the cleaner practices that manufacturers could employ.

This report should be read alongside the 2022-unit 3 paper and mark scheme. Centres are reminded of the item level data available on the WJEC secure website when they reflect on their candidates' performance. Feedback on candidate performance for the 2022 paper will also be discussed in the forthcoming CPD sessions planned for the autumn 2022.

I hope that the feedback provided in this report will enable centres to reflect on the strategies and advice given to their candidates as they prepare for the 2023 examination.

Resources that support the GCE Fashion and Textiles course are available on the WJEC website:
https://resources.wjec.co.uk/Pages/ResourceByArgs.aspx?subId=8&lvlId=1.

PRODUCT DESIGN

General Certificate of Education

Summer 2022

Advanced Subsidiary/Advanced

UNIT 3: WRITTEN PAPER

General Comments

- The paper was generally well received by candidates and most of the candidates answered all questions on the paper.

- Candidate's use of terminology and technical language together with knowledge of materials, design influences and manufacturing processes was generally weaker than the 2019 paper.

- We are starting to see more candidates making good use of planning notes to structure their responses and this is something that should be encouraged by centres during delivery of the course.

- There is a clear indication that the longer style responses generally require more structure and planning, as many candidates failed to clearly cover all requirements of the questions to gain the higher banding marks. Where candidates successfully applied their knowledge and understanding to the given context, they were able to access the higher mark bands within questions.

- Centres should continue to advise candidates to use the mark allocation indicated at the end of each question to guide the depth of response required.

- It appeared that most candidates used the time of the examination effectively and were able to dedicate sufficient time to all questions. When questions were not answered, it was often due to limited knowledge of the subject content rather than a lack of time.

- There were some scripts or sections of scripts that were illegible, candidates are reminded that they need to ensure the quality of written communication throughout is consistent.

Comments on individual questions/sections

Q.1 This question proved difficult for many candidates with a facility factor of 30.6. There was clear evidence that candidates had not explored the design strategy of morphological analysis. Where knowledge was clear the candidates scored high marks for the question and they were able to describe the design strategy effectively, with some using example tables / grids.

Many candidates identified the key considerations of using specifications. It was clear that candidates were able to use their skills and knowledge from their NEA projects to be able to link this to the question. A range of good responses were offered, and this was a well answered part of the question.

Q.2 This proved to be the most accessible question on the examination paper, with a facility factor of 58 and mean mark of 4.8 from 8. Candidates demonstrated their ability to interpret the stimulus provided and develop some good considerations that the manufacturer would need to consider.

Overall, candidates gave the main advantages and disadvantages relating to flat packed furniture. It was clear from the responses that centres have linked the knock down fittings to this type of product and some well-known furniture stores. On occasions candidates would only give advantages, not both advantages and disadvantages amplifying the importance to read the question carefully.

Q.3 This question proved difficult for many candidates with a facility factor of 30.4. There were mixed responses to this part of the question. Many candidates were able to achieve marks by referring to general benefits of metal finishes. Where candidates achieved the higher marks there was a clear link to the anodising process and how that benefits the manufacture of the chair.

The question was answered well by the candidates who understood that the anodising process was an electrical process. Unfortunately, too many candidates approached this question in the wrong way by describing the process of zinc galvanising as a protective process as per the 2019 Unit 3 examination question.

Q.4 With a facility factor of 51.8 this proved to be one of the most accessible questions on the examination paper. The best responses provided clear properties of plywood, which were linked to the product in question.

Standard bought in components were clearly understood by candidates and the vast majority were able to explain some good advantages with many linking this with just in time manufacturing.

Where candidates linked the batch production process to the balance trike they were able to discuss the benefits of manufacturing different coloured, shaped and special edition products to suit the needs and wants of the target market. Many candidates were also able to explain how batch production enabled faults and problems to be identified and rectified if required.

Q.5 There were mixed responses to this question with the mean mark at 3.6 for both part (a) and (b). Many candidates were able to achieve marks by identifying that the trademarks protect the logo or brand. Those that did achieve high standards were able to illustrate good levels of knowledge by identifying the process and time scales of registered trademarks.

Many candidates identified the ability to protect the product using a patent and where this was the case they went onto explain the benefits and process of applying for this intellectual property.

Q.6 There were mixed responses to this question with the mean mark of 3.8 for both part (a) and (b). Many candidates were able to achieve marks in part (a) by stating relevant health and safety requirements with the majority giving PPE and training as their responses. Candidates needed to describe this in more detail to be able to reach the higher marks. It is important that candidates expand on their response to achieve the top marks.

Responses to part (b) were generally weaker, with fewer candidates being able to explain in detail. The majority of candidates related answers to testing and safety but needed to expand on their responses further.

Q.7 With a facility factor of 53.0 this proved to be one of the most accessible questions on the examination paper. This question was generally well answered and it is clear that candidates have linked this to their own experiences of using 3D printing in their NEA projects.

Part (a) was answered well, however some candidate's responses were too general and not linked to the method of printing layer by layer as asked in the question.

Part (b) required a balanced response to achieve the top band mark as this was an AO3 'evaluate' question. Many candidates structured the response with clear benefits and limitations, however some candidates just listed or bullet pointed the correct responses missing out on the higher band marking descriptors.

Q.8 The facility factor for this question was 39.5, proving to be a challenging question to candidates. It must be noted that this question had three elements to it. The main concern with this question was that responses invariably did not offer detailed explanations as required for each part. The majority of responses for part (a) concentrated on the methods of promotion and lacked explanations of the impact of these.

Again, candidates were able to describe technology push but they were unable to link this to a detailed explanation of how it has contributed to the mobile phone sector. This was also similar with part (b) with many candidates able to describe that market pull is a need identified by a consumer or target market. Where candidates responded further explaining that this can arise from market research to make specific revitalised products, they achieved the top marks available.

Q.9 This question proved difficult for many candidates, with a facility factor of 39.4 and a mean mark of 3.2 out of 8. There were some good responses in which candidates identified a range of customer support methods including warranties, repair schemes, online and face to face support, however many did not go onto discussing the impact this could have on the company's reputation. It is vital that candidates read the question fully to understand what is required.

Q.10 Candidate responses to this question were hugely varied due to the open nature of this question.

This was an accessible question topic with a vast number of candidates making good attempts to link their skills and knowledge of testing and evaluating from the NEA project. The mean mark was 5.2 out of 12. Stronger candidates approached this question by focusing the response around the iterative design process, and then supported this with key benefits to the design and manufacture of a product.

There are still a large number of candidates that lack the structured well written answers required to meet the higher band marks and it would be beneficial if centres could continue to allow candidates to practice answers in a structured approach; using introduction, main points followed by a conclusion.

ENGINEERING DESIGN / FASHION AND TEXTILES / PRODUCT DESIGN

General Certificate of Education

Summer 2022

Advanced Subsidiary/Advanced

UNIT 4: DESIGN AND MAKE PROJECT (NEA)

General Comments

Following a very challenging and difficult time for candidates and teacher alike we have been extremely pleased with the way in which criteria for A Level Unit 4 has been met. With a perceived skills shortfall and a diverse range of circumstances faced by all centres we have still seen excellent examples of the fantastic design and innovation skills our candidates possess. Centres generally adapted the new changes, applied the new mark scheme and have identified additional requirements needed by Unit 4. Moving forward, consideration to the following comments and recommendations should be made.

Comments on individual questions/sections

Centres need to continue ensuring that candidates explore and analyse a range of project possibilities. These project possibilities could come under a range of contextual situations or could be under one context. There are still some centres directing candidates in certain briefs or context. The candidates must choose and develop their own briefs and it is not expected that whole samples show the same contexts. A good approach is to use 'live' projects with real clients, this has been seen to be a real benefit to the progress of many candidates' work and is seen as good practice.

The aim of the iterative process is to allow the candidates to consider a range of problems and briefs based on analysis of client requirements, research and deconstructing existing products and problems. At A Level it is also expected that candidates demonstrate a clear and logical plan or sequence for the development of their project. Furthermore, specifications will also demonstrate that they are working documents and contain some evaluative comments and ongoing iteration throughout the process. There was this year a large number of specifications which lacked sufficient measurable criteria, this is essential and allows evaluative comments to be really tested throughout the journey.

Design folios again were generally well laid out with good examples of the iterative process being followed by many centres. This was evident in A3 folios and some good use of sketchbooks. Centres should continue to encourage candidates to model, develop and iterate as much as possible. These models, tests, concepts could take on the form of a physical model or a 3D CAD model. Sketchbooks must also continue to be developed and encouraged as an iterative working tool, marks for good use of sketchbooks should be rewarded in the generating and developing ideas section. At A Level, greater reference to the implications of the design and its impact on social, moral and sustainability issues should be evident.

Product solutions and prototypes across many centres were appropriate considering the concessions in place. Please remember products should in future represent a finished functioning product. When centres are making concept models, the products, regardless of function, must look and feel like a real product. Quality of finish and the expectation of suitable manufacturing processes will be a real focus next year and it is important to note that the standard of finished prototypes will return to historic standards. Also remember only the finished prototype(s) can have marks awarded in this section. Marks cannot be awarded for models and test pieces, these are rewarded in 'generating and developing design ideas'.

Along with the finished prototypes centres should ensure that the logical sequence and timeline completed should be in a pre-emptive context. Centres should also ensure that flow charts and manufacturing plans contain sufficient detail, considering the 'third party' aspect. Moderators are seeing Gantt charts as a means of planning the manufacturing; although this is an acceptable method, a simple coloured box on a chart is meaningless unless it is reinforced with realistic detail including reference to H&S, QC and timings that reflect the true manufacturing process.

Evaluations as with the previous specification were generally well written. However, centres need to ensure that far greater time and emphasis is placed at A Level on evidencing, testing and user trials. Consideration here should also be made to how the product could better meet the needs of the user throughout its life cycle. Modifications should be fully realised in annotated sketches or CAD presentations.

Summary of key points

- A range of problems must be identified by the candidate not prescribed by the centre;
- The problems could come from one in-depth context or a range of different contexts could be considered;
- Specifications should contain a number of measurable criteria;
- Encourage more modelling and testing of concepts to aid the iterative process. Including CAD modelling;
- Continue to develop the use of sketchbooks as an iteration tool;
- The journey candidates have followed should be clear throughout the folio and sketchbook;
- Concepts and prototypes of designs made can only have marks awarded in the 'generating and developing ideas' section;
- The final concepts and prototype should look and feel like a real product;
- Standard of prototypes will return to historic standards next year (no concessions);
- Finish is important. Could the product be taken to an investor?;
- Logical sequences should be pre-emptive and should be sufficient for a third party to make the product;
- Evaluations should contain end testing and user trials with clear suggestions of possible modifications to the product.

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