



GCE A LEVEL EXAMINERS' REPORTS

DESIGN AND TECHNOLOGY: FASHION AND TEXTILES / PRODUCT DESIGN A LEVEL

SUMMER 2019

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DESIGN AND TECHNOLOGY: FASHION AND TEXTILES

GCE A LEVEL

Summer 2019

COMPONENT 1: FASHION AND TEXTILES

General Comments

The current academic year sees the first full award of the new GCE A level qualification in Fashion and Textiles with the 2019 cohort being the first candidates to sit this examination. This examination is worth 50% of the A level qualification. The number of entries for this new course is relatively low when compared to Product Design.

Most centres delivered a well-balanced course covering the full specification content which prepared their candidates for the non-exam assessment (NEA) and the theoretical aspect of the examination. Those centres are to be commended on their efforts as this approach ensures candidates gain the greatest success. From the evidence seen, there were many examples of excellent papers where candidates demonstrated sound subject knowledge and had clearly been well-prepared for the examination. Centres, where candidate performance in the NEA outweighed performance in the written examination, are advised to reflect on the delivery of the course given the 50:50 weighting for this qualification.

Questions were drawn from a broad range of topics listed in the 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 all questions, with no obvious questions causing any concerns. The maths element of the paper did not appear problematic for the majority of candidates although candidates do need reminding to show all their workings.

All questions are set in a context which either includes a picture of a product or, an outline scenario is stated. Candidates should be encouraged to carefully consider the context of the question before attempting an answer. This avoids knowledge in isolation and is intended to support candidates in applying their knowledge and understanding to the set context. Candidates should be mindful that overlong responses that stray away from the context of the question and do not answer the question, do not necessarily gain additional credit.

Comments on individual questions/sections

- Q.1** Candidates demonstrated good subject knowledge; overall the question was answered well and was considered very accessible, with most achieving high marks.
- (a)** Most candidates understood the purpose of a storyboard and gained full marks for this question.
 - (b)** Responses to this question varied. A product would be represented on a manufacturing specification as a detailed line drawing, (or flat) with all appropriate views along with the critical dimensions needed to make the finished product. Most candidates gained two marks for this part of the question. A number of candidates listed several other pieces of information when only two were asked for, but then failed to fully explain the importance of two of the '*other*' features listed.

Some responses were too long and did not fully answer the question. It is important that candidates read questions carefully, consider their response and keep to what the question demands. Writing more than is necessary does not gain additional marks.

Q.2 The responses to this question varied but overall considered accessible for most candidates.

- (a)** Most candidates clearly explained what is meant by the term laminating however some confused this with applying a coating which did not gain credit. Reasons for laminating the bottle carrier varied but most thought it would improve its properties. Some candidates suggested it would make it waterproof which is incorrect. Had candidates taken more notice of the question stem '*neoprene is a synthetic rubber which forms part of the laminated material*' they would have realised that neoprene – rubber – on its own is not suitable, it needs a more functional covering or for aesthetic reasons.
- (b)** Most candidates were able to describe a suitable method of comparing the thermal properties of different materials. The most common method was creating a fabric 'sock', to cover a test-tube filled with hot water, which is closed off with a rubber bung and thermometer. Time was also considered. Marks awarded varied depending on the candidates' version of the above method.
- (c)**
 - (i)** Most candidates correctly calculated the volume of liquid that could be held in a cylindrical bottle the same size as the bottle carrier. The formula for volume is $\pi r^2 \times h$. A few candidates did not consider the height others over complicated the calculation and failed to arrive at the correct answer: 1.2L or 1200ml.
 - (ii)** This question required candidates to calculate the circumference of the base: πd or $2\pi r$. This would give the longest edge of the rectangular template needed for the cylindrical part of the bottle carrier. A straight forward calculation although some candidates over complicated it and arrived at an incorrect answer.

Q.3 Overall the responses to this question were disappointing. A number of candidates repeated the same information in both parts of the question and failed to correctly answer either! Repetition in responses does not gain additional credit. Some answers were considered weak and superficial.

- (a)** This part question proved the most challenging for almost all candidates. Most suggested aramid fibres are strong and were given some credit however this question demanded more technical knowledge than that. Aramid fibres are engineered for very specific purposes, are five times stronger than nylon with no melting point for example. Other fibres derived from petrochemicals do not have these particular characteristics. Some made reference to the products in the picture which were included to support the next question. Few candidates were awarded full marks for this question.
- (b)** This question was an improvement on part (a). Most candidates clearly understood the use of Kevlar in protective clothing, answers were fully supported with sound reasoning. The safety gloves being cut resistant was the least popular answer.

Q.4 Candidate responses varied, depending on the methods of construction or calculation put forward. Overall the question was considered very accessible.

- (a)** Almost all candidates offered comprehensive details of a suitable method of making a pennant. A common feature often omitted was trimming the inner seam allowance and in particular the point which would allow the pennant to lie flat when turned through. Most included the binding along the top in their description and although this wasn't necessarily asked for, was given credit. Some missed the fact that each pennant was to be made from two pieces of fabric. A case of not reading the question carefully!
- (b)** The correct method of calculating the number of pennants that could be cut from a piece of fabric 150cm wide by one metre in length, depended on laying 7 pennant pieces across the 150cm wide fabric, inverting another 7 across the width, closely tessellating the templates. A minority of candidates correctly identified that this method would allow the height of each pennant to follow the straight of grain line on the fabric as stated in the question stem. 14 pennants fit across the fabric, with 3 rows of 14 moving down the fabric. 42 separate pieces can be cut but as each pennant is made up from 2 pieces of fabric this makes 21 pennants. Although better fabric usage is achievable by turning the pennant width for length this does not take account all of the information stated i.e. height of pennant follows the straight grain. Calculations based on the surface area were incorrect as they do not take into account wastage/ half triangles that would inevitably be formed. Technically this latter method would not be used in the textile industry when calculating a lay plan.
- (c)** Most candidates approached this question correctly and calculated 770m would be needed for the bunting, that, times 75p per metre gave an answer of £577.50. Some missed the 2 cm gap between each pennant. Some unfortunately put the decimal point in the wrong place and consequently got the answer wrong! More care is needed.

Q.5 This question was answered well by almost all candidates and considered very accessible.

- (a)** Most candidates defined the term 'iconic' with some responses demonstrating a deeper level of understanding than others. Less clearly explained were the reasons why contemporary designers are influenced by such designs. Some explanations were too long and often strayed away from the main focus of the question.
- (b)** This question was deemed very accessible to almost all candidates. They clearly understood the purpose of a lining in a jacket similar to the one shown. Explanations were clear, concise and fully answered the question.

Q.6 Overall the responses to this question varied; few candidates achieved full marks.

The question was about using laser cutters for 'design purposes' for example engraving fabrics and cut work which can be far more intricate than any other more traditional methods. Essentially what innovative and creative possibilities do lasers present to designers? Several candidates referenced lay planning and cutting out several plies of fabric during manufacture. Both were incorrect answers that did not gain credit.

Q.7 The responses to this question varied and, in some cases, candidates could not differentiate between quality assurance and quality control. Again, there was repetition in both answers which did not necessarily gain additional marks. Both parts to this question address AO3 where candidates need to show for 'analyse', logical chains of reasoning or connections within the information they are presenting. When evaluating there needs to be evidence of appraisal or making judgement in their responses. Some answers were more descriptive consequently full marks could not be awarded.

(a) Quality assurance (QA) is an over-arching system of checks designed to ensure products are free from faults; a set of processes monitoring production. QA focuses on the prevention of defects before production starts – testing and setting up equipment for example. It often starts with design through to after sales service. A number of candidates focussed on quality control aspects and although part of QA, did not fully answer this particular question.

(b) Most candidates fared better with this question than the previous one. Quality control (QC) was better understood than quality assurance and most candidates were able to describe appropriate QC points for the school shirt. The ability to evaluate effectively let some candidates down. Note, over long 'rambling' responses do not gain marks. Pertinent points must be presented concisely.

Q.8 Responses varied for this question but overall was answered well with many candidates awarded full marks. This question also addressed AO3 where for 'analyse' evidence of logical chains of reasoning were required.

Many candidates focussed on the work of designer Stella McCartney when answering this question although this was not specifically about her work, although it does exemplify what this question asked. Some candidates referenced the work of other designers to support their answers. This question was however related to 'high-end' designer type fashion typically seen on catwalks or high-end stores for example. Some candidates missed that point. Fairtrade, referenced by many candidates, does not fit into the descriptor of high-end. Candidates who discussed moral, social and ethical approaches to fabric choice, use of renewable energy sources for manufacture, cleaner processes for manufacture for example gained the most marks. I reiterate over long 'rambling' responses do not gain marks. Pertinent points must be presented concisely.

Q.9 This question was disappointing with only a few candidates fully understanding cell production. Few candidates were awarded full marks.

There were three elements to this question: cell production, benefits to the manufacturers and to the cell production worker. Where questions are structured in this way candidates should ensure all parts are considered within their answers. Some candidates did not address all three elements and consequently missed out on some marks.

Some candidates did not appear familiar with the term cell production and described a more general approach to manufacturing. Although credit was given for a partial response technically these candidates did not answer the question. In other responses there was some evidence of understanding but explanations lacked clarity and tended to stray away from the main focus of the question.

- Q.10** Overall this question was disappointing with only a minority of candidates gaining high marks. Those that gained the highest marks demonstrated very clear and detailed subject knowledge and expressed themselves with clarity and with clear evidence of appraisal in this, the final AO3 question.

In order to successfully answer this question candidates needed to demonstrate knowledge and understanding of technology-push and market-pull in relation to wearable electronics. Whilst technology-push and market-pull were generally understood, the weakest element of this question was knowledge of wearable electronics within fashion and textile products (as stated in the question stem). Examples of wearable technology include integrated heart monitors, blood pressure monitors, tracking systems, heating elements and communication systems - soft switches that rely on conductive threads in order to function. Smart watches or fitness trackers do not fully answer this question as some suggested! The best responses focussed on how emerging integrated new technology within fashion and textiles is pushed into the market place in new or re-invented products such as those listed; these products are embraced by consumers. Market pull identifies a growing need for more of the same wearable technology from consumers. Micro and Nano has opened up endless opportunities for new technological products specifically within fashion and textiles without which many of the listed products would not exist. Few candidates acknowledged that fact.

Quality of written communication which was assessed in this question was mostly considered good.

Summary of key points

- This report should be read alongside the 2019 component 1 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. Item level data sets out the candidates' performance in this year's paper at a national level as well as centre/individual candidate performance. Feedback on candidate performance for the 2019 paper will also be discussed in the forthcoming CPD sessions planned for the autumn 2019.
- I hope that the feedback I have provided in this report will enable centres to reflect on the strategies and advice given to their candidates as they prepare for the 2020 examination.
- Resources that support the GCE Fashion and Textiles course are available on the WJEC website:
<https://resources.wjec.co.uk/Pages/ResourceSingle.aspx?rlid=2633>
<https://resources.wjec.co.uk/Pages/ResourceSingle.aspx?rlid=2627>

DESIGN AND TECHNOLOGY: PRODUCT DESIGN

GCE A LEVEL

Summer 2019

COMPONENT 1: PRODUCT DESIGN

General Comments

Considering this was the first time many candidates had sat this style of paper it was pleasing to see some quality work done by many, though in some cases, candidates used generic terms such as 'strong' when referring to material properties without explaining what type of strength e.g. tensile, torsion etc. and therefore could not be given credit. Candidates should be encouraged to be as specific and detailed as possible in response to the questions on the examination paper.

For the extended answers at the end of the paper, candidates should be encouraged to underline the key points of the question to make sure they address each point. Many candidates provided mind maps or tables as a plan that allowed them to explore the question before starting to respond. This ensured that the candidate's answers were well constructed and addressed each part of the question allowing them to access the higher marks.

Candidates should be reminded to look at the mark allocation for each question so that they can make sure they provide detailed answers of suitable depth to gain maximum marks particularly for those questions that have a high mark value. In some instances, correct answers were provided but they were not provided in sufficient detail to gain the higher allocation of marks.

Comments on individual questions/sections

- Q.1**
- (a)** The majority of students correctly identified the material as carbon fibre. A few responses made reference to similar woven composite materials which were credited by the examiners.
 - (b)** In the strongest responses' candidates explained why the material was suitable using specific material properties such as 'tensile strength' and made a connection between the material property and the reasons why this was appropriate for the chosen product – a racing drone.
 - (c)** This was a popular question with most students answering correctly.
 - (d)** This question was generally answered correctly but some candidates did not provide enough detail of the specific test in order to gain the full three marks.
- Q.2**
- (a)**
 - (i)** The majority of candidates answered this correctly showing valid mathematical method. Some candidates simply showed the final answer. Candidates should be reminded to show full working as on larger mark questions, some credit can be given for the method used even if the final answer is incorrect.

- (ii) In the vast majority of cases the candidates answered this correctly. In a few instances candidates incorrectly added 10% to the value they presented in 2a(i).
- (iii) Excellent responses to this question showed a sound understanding of the application of mathematics in a Design & Technology context.
- (b) Many candidates were able to explain how the use of the template would be beneficial. This was a very well answered question.
- (c) Almost all candidates gave an advantage of 3D printing in this context. Those who provided a full description were able to gain the full two marks.
- (d) Many candidates discussed the environmental impact of using a plastic material and this showed a full and detailed understanding of the environmental impact. Many students made reference to companies making many thousands of models which would most likely go to landfill giving them the opportunity to discuss the negative impact. A few candidates also discussed how high-quality prototypes used for thorough testing ultimately lead to higher quality and longer lasting products thus reducing impact at the end of the life-cycle.

This was a very well answered question with many candidates accessing high marks

- Q.3**
- (a) The majority of responses correctly described the sequence of steps in the injection moulding process and many candidates used the correct terminology to describe parts of the injection moulding machine. Some candidates drew a picture of the process and while this was not credited directly, it did in some instances help clarify the description.
 - (b) Many candidates showed an excellent understanding of why steel is used for moulds and made reference to the specific material properties such as thermal conductivity or durability. In the strongest responses' candidates provided a full explanation as to why steel is suitable in the context of the mould rather than simply explaining the properties and characteristics of steel.
- Q.4** Almost all candidates attempted this question. Many candidates showed full calculations leading to the final answer and were able to access the full marks for this question. Even where candidates failed to calculate the correct final answer, partial credit could be given for method marks. It is important therefore that candidates remember to show all of their calculations on the answer sheet rather than just relying on a calculator and presenting the correct final sum.
- Q.5**
- (a) Many candidates were able to provide a definition of mechanical properties with a suitable example, few however were able to provide a suitable definition of physical properties, often providing mechanical properties as an example.
 - (b) Strong answers to this question directly linked the material properties to the application of the trampoline and some of the best answers demonstrated the candidate's understanding of why materials were chosen for this specific application.

Many candidates described the forces that would be acting on the trampoline during normal use and gave a suitable material property that could withstand the said force showing excellent knowledge in context.

- (c) This answer allowed the students the opportunity to demonstrate the understanding of physical and mechanical properties. Strong candidate responses described several properties in the context of use on the trampoline suitable for a question worth 4 marks. Some students failed to access the full marks as they described only one property which lacked enough detail to be awarded the 4 marks.

Q.6 Candidates showed an excellent understanding of how composite boards have impacted on the design of flat-pack furniture. The strongest candidate responses linked the two aspects of the question together allowing for a full and detailed explanation.

The weaker responses tended to talk about the advantages and disadvantages of composite boards over natural timbers without any reference to the flat-pack context. While this showed a good understanding, it did not address the question asked and so limited the number of marks that could be awarded.

Q.7 (a) There were many excellent responses to this question and candidates were able to use their practical experience in the school workshops and apply it to the question in order to provide an excellent analysis. The strongest responses from candidates identified a risk to the user and then analysed the design feature of the drill which helped reduce or negate that said risk. The detailed analysis by candidates demonstrated an excellent ability to bridge the learning in the practical environment to this theory paper.

Weaker responses to this question failed to explain how the safety feature helped reduce risk to the user, or only analysed one or two safety considerations.

(b) Candidates showed an excellent understanding of the benefits and limitations of solar power for the given context of the factory. Many also discussed the geographical location such as the UK versus locations in southern Europe. Many candidates showed an excellent appreciation of the challenges that would be faced if the factory were to run for 18-24 hours a day.

On a few occasions' candidates jumped straight into a discussion on hydro-electric or wind power, ignoring the question limiting the number of marks that could be awarded.

Q.8 Candidates are encouraged to use examples to help explain their answers, especially when the question specifically asks for it as this allows the candidate the opportunity to give a full and detailed evaluation of a product they are familiar with. Those who provided examples were ultimately awarded higher marks as explanations and evaluations tended to be more detailed and coherent as the candidates were able to reference their own experience.

To access the full marks the candidates needed to explain how products could be maintained by the consumer and how, through this maintenance, they impacted the environment. There were some excellent examples provided from cycles, to vacuum cleaners to digital products showing that the candidates have studied products from a maintenance viewpoint.

A few candidates discussed the product life cycle but failed to link the response to the context of the question significantly affecting the mark that could be awarded.

- Q.9** Candidates showed an excellent understanding of the benefits of CAD/CAM. Weaker responses tended to limit their answer to a discussion on these benefits without making reference to the global workforce as specifically asked in the question and this limited the amount of marks that could be awarded.

Where candidates did make the link to a global workforce answers were well-constructed, fluent and showed an excellent understanding of global design and manufacture businesses. The best answers were those that used examples of companies to help the candidate explain the points they were making. Many candidates made reference to linking global workforces balancing cost and supply of labour, equipment and moral and ethical issues of worker conditions. The introduction of 3D printing played a prominent part in many answers and candidates were able to discuss the benefits of distributing CAD files to several locations for printing/evaluation in those locations.

- Q.10** Where candidates knew what concurrent engineering was, they were able to provide detailed answers linked to high volume products or complex one-off products. These candidates were able to explain how the concurrent design/engineering/manufacturing activities would be carried out and what advantages and disadvantages there were to this way of working. There were excellent responses from candidates who were able to describe individual/teams who have expertise in certain areas working together on different parts of the project at the same time.

Some candidates focused solely on the manufacturing part of the process and while they were able to gain some credit for this type of response, they did not provide enough detail about the concurrent engineering methodology to be able to access the full marks for this question.

Some candidates confused concurrent engineering with reverse engineering or continuous flow manufacturing.

Summary of key points

- Candidates should be encouraged to be as specific and detailed as possible in response to the questions on the examination paper.
- For the extended answers at the end of the paper, candidates should be encouraged to underline the key points of the question to make sure they address each point.
- Candidates should be reminded to look at the mark allocation for each question so that they can make sure they provide detailed answers of suitable depth to gain maximum marks particularly for those questions that have a high mark value.
- Candidates should use the time allocation wisely quickly calculate the time for each individual question.

DESIGN AND TECHNOLOGY: FASHION AND TEXTILES

GCE A LEVEL

Summer 2019

COMPONENT 2: NON-EXAMINED ASSESSMENT (FASHION AND TEXTILES)

General Comments

This year sees the first full award of the new GCE A level qualification in Fashion and Textiles.

Most centres appeared to have taken the advice on board that was given out following the first AS qualification in 2018 and have established a sound foundation for the successful delivery of this course at A level. In general terms, the iterative process is understood, and evidence of testing and modelling has shown some improvement. Centres have embraced the changes to the assessment criteria and more importantly applied it fairly.

Design folios were generally well organised with most candidates adopting an informal sketchbook to record the iterative design journey and a more formal portfolio for technical details. This approach lends itself well to fashion and textiles candidates and allows them freedom to express their ideas in a range of creative styles.

Comments on individual questions/sections

Identifying and investigating design possibilities

The assessment criteria clearly demands that candidates explore a number of contexts initially in order to identify a broad range of design possibilities. These are not to be confused with a design brief that should only be arrived at following analysis of the context/problems and some early research. In most cases research was wide ranging and supported candidates in their decision making. It is advisable however that more detailed research continues alongside the generation and development of design ideas – one-part informing/impacting on the other. For example, research into materials should occur alongside testing and modelling of processes and techniques. This would lead to more informed decisions being made and an altogether much better understanding of the materials and product requirements. Research into materials should not appear as a separate fact-finding mission with no real purpose. Another area for improvement would be the identification of and engagement with a ‘real’ client. On-going dialogue with the user would become more accessible, would support candidates as their ideas develop and whilst testing their ideas and final prototype.

At A level the same approaches outlined above apply but research should be more comprehensive and detailed. Candidates are also expected to present a project management plan which is not to be confused with a sequence for manufacture which forms part of assessment strand (d). Approaches and effectiveness of this latter requirement varied but overall is an area for development.

Developing a design brief and specification

At A level, the final design brief should only be arrived at following the exploration of a range of possible design opportunities and analysis of research and investigation. In some cases, it was difficult to see how the final brief had been arrived at. An open-minded approach, avoiding idea fixation until other possibilities have been explored is advised.

Quality of specifications varied but most candidates offered a range of appropriate criterion. At A level there needs to be clear progression in terms of detail from AS level. Measurable criteria were often considered superficial and needs further refinement. As with the brief, in a minority of cases it was difficult to ascertain where some criterion came from! Specifications are working documents and should be referred to throughout the iterative process.

Generating and developing design ideas

Sketchbooks were well used to record initial ideas and development iterations. Most candidates presented clear evidence of testing and trialling of ideas from decorative techniques to construction processes. At A level this is however expected to be more in-depth and progressive. In a few centres there was excellent use of full-scale toiles that fully supported the development of the prototype and thoroughly tested its fitness for purposes prior to manufacture. In some centres the specification had been used to support decision making and the development of the product, though this again is an area for further development. Centres should note that social, moral and ethical factors also need due consideration where appropriate with the addition of environmental factors, sustainability and cost at A level.

Most candidates presented their final idea alongside the technical details in a formal portfolio, although level of detail varied. In a manufacturing specification product should be visually represented as a technical line drawing or fashion 'flat' displaying all seams, topstitching, components and any other design details along with all appropriate views. All critical measurements should be included with sufficient details for a third party to realise the same. At A level recommendations for different scales of production are required, this was not always evident.

Manufacturing a prototype

Candidates presented sequences for manufacture that included consideration of time however consideration for end testing was not always evident. Note that the sequence should be pre-emptive and sufficiently detailed for a 3rd party to realise the same. Overall products were well made at A level with clear consideration of appropriate materials, components and manufacturing processes. Products represented finished prototypes and were considered fit for purpose. In a few cases attention to detail in the quality of construction both externally and internally could be further refined. Note that 'quality' in a fashion and textiles products requires the internal finish to be of an equal standard to that of the external finish. In a few centres, some candidates had manufactured products that were of an exceptionally high standard, with many innovative and creative details.

Analysing and evaluating design decisions and prototypes

Most candidates had included reflective commentary as an on-going process throughout their iterative journey. Moving forward, some might find full engagement with a 'real' client more beneficial as potential issues could be highlighted and resolved earlier on in the process.

Summative evaluations were generally well written, considered the design brief and specification, took into account views of users and referenced end testing. More robust specification criteria would support candidates better particularly with reference to measurable criteria. End testing, through wearer or user trials is essential in gauging the success or otherwise of a product. This should be evidence based so photographic images of testing in situ are recommended. This is an area for further development at A level, candidates are also required to consider developing/improving their product in order to meet the needs, wants and values of users throughout its life cycle. Again, this was not always evident.

Many candidates had produced highly creative and imaginative work, clearly seen throughout their design journey through iterations with very high levels of skill evident in their final prototypes; those candidates should be commended for their efforts. That said, fashion by definition often pushes boundaries in terms of innovation or people's perception. With this thought in mind and although not a set requirement of the NEA, it would be interesting to see the latest technology being embraced by fashion and textiles candidates in an innovative and imaginative way. Integrated wearable electronics perhaps, or the use of 3D printers which have been fully embraced in Product Design, much less so in Fashion and Textiles. Something to consider for the future which will build on the achievements of the current cohorts.

DESIGN AND TECHNOLOGY: PRODUCT DESIGN

GCE A LEVEL

Summer 2019

COMPONENT 2: NON-EXAMINED ASSESSEMENT (PRODUCT DESIGN)

General Comments

The new specification has been well received and applied appropriately by the majority of centres. With the descriptors at A level varying slightly from AS, the following comments and recommendations are common to both qualifications.

For A level, this was the first experience of assessment/moderation under the new guidance, with the majority of centres opting for the two-year A level structure. As with last year's AS, this gave each centre the chance to express their interpretation of the new specification in what is an organic approach, moving away from the linear model.

The extension to two years at A level gave the chance to explore a range of potential outcomes, and moderators saw some exceptional outcomes. The emphasis towards an iterative process allowed the centres to explore the possibilities of their designing and making. The method of generating ideas whether by sketching, 3D modelling or virtual means, allowed individuals the ability to explore, and develop in styles suited to them, whilst on-going testing helped develop their solutions.

Comments on individual questions/sections

The specification is clear, that the context for the design and make "should be investigated", and a Design Brief should be refined, and developed, whether given as a contextual challenge at AS or determined by the candidates themselves at A level. The investigation and selection is an individual choice and should be encouraged to be so, not centre directed. It is vital that unnecessary research should be avoided, allowing "potential users needs and wants" to be a driving focus of the project.

There was evidence presented by the candidates within specifications that quantitative and qualitative criteria gave support to the development of the projects. This scaffolding allowed focused and refined designing, with suitable comment/annotation to act as formative evaluation supporting the iterative process. With objective criteria guiding the projects on-going testing highlighted decisions throughout the journey giving strength to the candidate's work.

Excellent modelling and rapid prototyping were presented which reinforced the exploration of the Design and Technology process showing breadth of skills applicable to the NEA. The creativity and range of the sketchbook work, either actual or virtual again gave strength to the design process especially where that link was purposeful and linked to the organic development of products. An A Level candidate should include clearly identified and perceptively considered environmental, sustainability, costs, social, moral and ethical factors, which are clearly relevant to the design and potential user(s).

It is essential that centres realise that the marks for models and test pieces can only be awarded in the developing section and the prototype marks should be just for the final piece. Centres must be aware of the allocation of marks in this area while still maintaining the need for a fully functioning prototype.

The area where centres needed to be mindful was that of the final prototype's quality and appropriate detail. The established standards of quality built up over the previous specification have been aligned to the definition of "prototype" successfully for the majority of candidates. If anything, candidates have used this to become more creative and adventurous in the selection of their outcomes whilst trying to fit the needs and wants of users.

The mark scheme provides a clear indication of the importance of a meaningful conclusion to the NEA. With a specification, giving the framework for an iterative and detailed design process, then formative comment should be evident. The summative evaluation is always an area where candidates can demonstrate their understanding of the process and end testing, with user trials, giving the final "fit for purpose" endorsement or potential for further development.

Summary of key points

Looking forward to 2020

- I would reinforce the message that the moderation of the NEA welcomes a creative, innovative approach where centres willing to push the boundaries will not be penalised, and candidates should be encouraged to seek out this type of challenge ensuring the wants and needs of users have been met.
- The iterative process where each step and decision made is connected, has replaced the linear model. Outcomes should evolve from this method reflecting the candidate's investigation and ability to create quality prototypes.
- There will always be a need for more formalised methods of communication, and this should remain, but as the specification matures, the freedom to express themselves will inspire students to tackle challenging scenarios and enhance their individual learning journey with the opportunity to access the higher-grade boundaries, while maintaining the fundamentals of manufacturing detail.
- At A level there is requirement to present a clear and logical plan for the project and that detail needs to be of suitable depth to gain those marks. A hastily prepared Gantt chart may not meet that threshold if it lacks detail.
- Finally, the mark scheme is a "best fit" model with the descriptors fully laid out in the specification centres should not allocate marks with any perceived importance, or remove descriptors, and expect to fulfil that mark boundary.



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