GCSE

Rewarding Learning

Chief Examiner's and Principal Moderator's Report

Technology and Design

Summer Series 2023

Foreword

This booklet outlines the performance of candidates in all aspects of this specification for the Summer 2023 series.

CCEA hopes that the Chief Examiner's and Principal Moderator's report will be viewed as a helpful and constructive medium to further support teachers and the learning process.

This booklet forms part of the suite of support materials for the specification. Further materials are available from the specification's microsite on our website at www.ccea.org.uk.

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GCSE TECHNOLOGY AND DESIGN

Chief Examiner's Report

Subject Overview

Poor handwriting was evident in several scripts. This caused difficulty for markers. Candidates should be made aware of the importance of clear legible handwriting when answering questions.

Although many candidates can produce well laid out flowcharts, a number of candidates fail to see the importance of producing neat symbols when constructing flow charts and often resort to drawing rough circles for every symbol. Time taken to produce clearly laid out flowcharts using the correct symbols should improve results for many candidates.

Some 4134 candidates were entered for the core module. Option C: Product Design was the most popular option with an entry of 1570 candidates; this was followed by Option A: Electronic and Microelectronic Control Systems which had an entry of 822 candidates and Option B: Mechanical and Pneumatic Control Systems which had an entry of 601 candidate.

Some candidates would benefit by taking more care when reading questions to have a clear focus on what a particular question is asking.

Assessment Unit 1 Technology and Design Core Content

Unit Overview

It was pleasing to note that there were fewer low marked scripts than in previous years.

Markers confirmed that the paper catered for the whole range of abilities and enabled the majority of candidates to attempt all questions. Only a very small number of candidates, some of whom left many answers blank, did not attempt all the questions.

Questions ranged from one-mark answers to more substantial questions that required reasoning and discussion of processes.

There was no evidence to suggest that candidates had insufficient time to complete the paper.

The level of language and readability of questions was deemed appropriate.

Q1 In part (a) the responses ranged from very good to poor. Candidates need to respond with correct names and sketches as given in appendix 3 of the specification. Very few candidates were able to sketch the symbol for the mechanical lever; many produced a sketch of the pneumatic lever symbol. A number of candidates were unable to produce an acceptable sketch of the thermistor symbol and a number of candidates' were unable to name the hazard symbol correctly. Some candidates wrote roller or roller follower in response to the roller trip symbol. Parts (b)(i) and (ii) were generally well answered by the majority of candidates but some did not attempt one or both of these basic questions.

Q2 Part (a) was generally well answered although a number of candidates thought that urea formaldehyde was the most suitable plastic for vacuum forming. Many candidates were able to give the correct reason but in other cases answers were not specific enough to attract both marks. In Part (b) many candidates gave clear sequential responses to the question. Other responses were often too vague or lacked understanding of the stages in the vacuum forming process. With a little more clarity some candidates could have gained more marks here. The majority of candidates were able to score some marks.

Q3 The majority of candidates were able to correctly mark the direction of rotation on both gears although a small number of candidates thought they rotated in opposite directions. Many candidates correctly marked the direction of movement of loads D and C but this part was less well answered with a number of candidates indicating that the loads were rotating. The more able candidates correctly calculated the speed of rotation of wheels A and C in Part (ii) but for many others the calculation proved difficult. A number of candidates did not attempt this part of the question.

Q4 Almost everyone correctly named the three pneumatic symbols in Part (a) and a majority of candidates were able to name at least one or other of the two pneumatic components in Part (b)(i). To be awarded marks candidates need to give the full name of the component, a number of candidates were writing button rather than push button for A. Many candidates provided full explanations in response to Part (b)(ii) but a number of others only provided partial answers to the control of the circuit by not explaining how the circuit was switched off.

Q5 Part (a) of this question was well answered by the majority of candidates with many achieving full or nearly full marks. Some candidates thought that copper is a good insulator of heat and that a marking knife is used to mark lines on metal. Others selected 'a thermoplastic' for melamine. In Part (b) many candidates struggled to outline the difference between the wasting and joining processes with the wasting process causing most difficulty. Only the better informed and more able candidates were able to provide acceptable answers for both marks and give one or two acceptable wasting processes for metals. Some candidates gave examples relating to wood.

Q6 In Part (a)(i) the vast majority of candidates were able to identify component A as a switch and B as a battery and most candidates correctly identified the motor. Parts (ii) and (iii) were also well answered although a number of candidates were not able to identify component C correctly or state how the output was controlled. Many candidates completed Part (b) correctly, but a surprising number produced unacceptable symbols, especially the battery symbol. Some candidates produced symbols but did not bother to insert them to complete the circuit as required in the question. Part (c)(i) was very well answered and a majority of candidates responded well to Part (b)(ii), most were able to work out colour bands one and two but colour band three was least well answered.

Q7 Many correct answers were produced for this flowchart question, they were neat, logical, well presented and drawn with correct symbols but there were also flow charts at the other end of the spectrum. Most candidates were able to achieve reasonable marks in this question.

A number of candidates did not set the alarm system at the beginning of the process and or did not switch the buzzer and LED off at the end. Many candidates produced unacceptable or poorly drawn cell symbols and many others had processes that were out of sequence. A number of weaker candidates drew circles around every instruction. Many candidates could improve their results by reflecting on some of the points above.

Candidates should be reminded that only generic flowcharts should be produced using the symbols that appear in appendix 3 of the specification. T his is stated quite clearly in section 1.39 of the specification. Statements need to be clear and precise.

Q8 Part (a) was generally well answered by many candidates, but it was surprising to find a number of candidates who were unable to put the three joining processes in the correct order. In Part (b) many candidates were able to outline four stages in the soft soldering process. A lack of clarity in responses was also evident in a number of other responses but in general most candidates were able to pick up some marks in this question. Parts (c)(i) and (ii) were not well answered, in Part (c)(i) the majority of candidates struggled to outline the difference between the two semi-permanent methods of joining. In Part (c)(ii) a number of candidates were able to select the correct method from the two given but very few were able to follow through with an acceptable reason.

Q9 Almost all candidates were able to achieve full marks for Part (a)(i). In Part (a)(ii) very many candidates recognized that valves A and B had to be operated but a number of others provided vague explanations of air pushing the SAC out without any reference to operating A and B. Many candidates recognized the need to adjust or remove the unidirectional flow restrictor in response to Part (a)(iii) but in a number of other cases the responses were vague or confused. Very many candidates got Part (iv) correct but some candidates left this answer blank. Part (b)(i) was well answered but some candidates responded with unsuitable answers. In Part (b)(ii) most candidates were able to state one or two acceptable reasons.

Q10 The marks awarded in this question spread across all three response types, very good, satisfactory and limited with most candidates scoring in the satisfactory range. The more able candidates were able to provide measurements to locate the brass sheet in the centre of the mahogany board and describe how to locate and mark out the four holes ready for drilling. They also recognized the need to clamp the sheet before drilling and were able to reference appropriate safety precautions. Although the size of the mahogany board and brass sheet was given in the stem of the question it was disappointing to see some candidates describe the cutting out of the mahogany board and the brass sheet to size. Careful reading of the questions may have improved results for such candidates. A number of candidates simply regurgitated some sentences from the stem and made little attempt to provide measurements. In a number of cases the tools used were incorrect, for example, using a scriber when a centre punch was required. Some candidates drilled holes into the mahogany with a countersunk bit. Many did not drill a pilot hole in the brass before using a countersunk bit. The use of a bradawl to locate the first screw in the mahogany was rarely mentioned. Some candidates continue to give isolated lists of general safety precautions and tools to be used rather than integrate them in the body of the text.

Assessment Unit 2 Option A: Electronic and Microelectronic Control Systems

Unit Overview

The general standard of response to the examination paper was good with a significant number of candidates making a good response to both questions. The level of language used throughout the examination paper was appropriate for the candidates sitting the examination. There was no evidence that candidates in general had insufficient time to complete the examination paper. Examiners reported that the answers indicated a large spread of marks catering for a full range of abilities.

Most candidates were able to attempt nearly all parts of each section of the two questions. Progression in both questions and a gradual degree of difficulty seemed to enable all abilities to provide answers and clearly will assist with differentiation within the paper. In general, there was a good indication that candidates were confident in dealing with flow chart questions but there is room for development in drawing and using the range of component symbols and in performing calculations in relation to electronics.

Q1 **(a)** **(i-ii)** The majority of candidates produced an accurate and correctly labelled sketch of a thyristor symbol, but some candidates produced sketches of other components such as diodes and transistors. In general, there seemed to be a section of the cohort that were not confident in drawing and identifying symbols.

(iii) Some candidates experienced difficulty in explaining the use of a thyristor as a latching switch for two marks, although almost all candidates were able to achieve one mark.

(b) **(i)** Almost all candidates were able to identify the potential divider circuit or recognise the circuit as a temperature sensing circuit.

(ii) Most candidates were able to identify the two symbols presented in the circuit.

(iii) Most candidates were able to identify the PTM switch, however, a few candidates stated only “switch” which was insufficient for the mark.

(iv) Many candidates struggled to explain the operation of a potential divider circuit in relation to the named components, however, many candidates were able to explain the formula and how it may be used to calculate the voltage at X.

(c) **(i)** Most candidates achieved full marks in this question, but some were unable to correctly produce the symbols for the LED in particular by omitting elements of the symbol or by incorrect orientation of the symbols.

(ii) Most candidates explained the function and operation of the components in the added components for full marks.

(iii) The vast majority of the candidates recognised the function of the addition as a “power on indicator” for the circuit.

(iv) This question was poorly addressed in general; most candidates did not complete the initial step of calculating the voltage drop but otherwise used the correct method to calculate the value of the resistor.

(d) **(i)** This question produced a polarised response, around half the candidates seemed confident and were able to access most of the marks but many seemed unsure about the symbols for the relay and the use of a diode to prevent back EMF and omitted the labels required in the question.

(ii) The majority of candidates were able to identify the requirement for a protective resistor at the base of the transistor, but many did not identify the need for a diode at the relay coil.

(iii) Most candidates identified that the circuit could be used to switch a higher voltage circuit, but a many of the candidates did not present a coherent answer.

(e) The vast majority of candidates were able to access most of the marks in this question and produced good explanations of the purpose of using flowcharts and flowchart elements.

Q2 **(a)** **(i)** The majority of candidates were able to describe the characteristics of a digital input, but many struggled to describe the characteristics of an analogue input.

(ii) Almost all candidates produced acceptable diagrams of an analogue signal but some produced sketches of digital signals that had fundamental flaws.

(b) This question was well addressed, and most candidates achieved full marks.

(c) Most candidate gave two coherent advantages of the use of PIC microcontrollers, but some candidates gave generic answers which did not warrant any marks.

(d) **(i-iii)** The flowcharts in general were answered well with many of the candidates using the correct command shapes for the various functions. The repeat count 9 was generally misread and poorly executed in the flow chart for part (ii). Candidates should be encouraged to make the flowchart symbols and commands as neat as possible and write the contents legibly.

Assessment Unit 2 Option B: Mechanical and Pneumatic Control Systems

Unit Overview

On average candidates performed reasonably well within the paper with a full range of marks obtained. The paper catered for a range of abilities and allowed for progression and differentiation with a range of question styles. It was evident that the mechanisms section was more challenging for pupils than pneumatics. Students struggled with some basic mechanism symbols within the first question, particularly the drawing of symbols which should be clear and as per the specification appendix.

Most candidates attempted to answer all questions with many showing their working out for calculation questions, which is welcomed, as these marks can and will be awarded for correct attempts at solving the problem. Candidates should be reminded that where ratios are asked for, the answer should be given in a ratio format such as 1:2 and not left as a fraction or a decimal.

In the describe, explain and QWC responses, most candidates answered questions with full sentences and succinct answers. Handwriting was in most cases legible and clear with subject-specific knowledge and key vocabulary used well by high-ability candidates.

Q1 **(a)** The majority of candidates answered this question; however, many candidates were not able to identify the threaded bar or pivoted lever. Candidates should be reminded to use the names given in the specification appendix and where functions are given, follow the question instructions and record the appropriate letter in the box given instead of making up their own function definition, which occurred quite a few times.

(b) **(i)** Well answered.

(ii) Some candidates failed to identify that the teeth on a motor sprocket are the same size as those on the machine sprocket.

(iii) Well answered.

(iv) Many candidates were able to identify one advantage of a sprocket and chain system but struggled with identifying more reasons than lack of slip.

(v) Again, many candidates were able to identify one disadvantage of a sprocket and chain system but struggled with identifying more reasons than requires lubrication.

(vi) This question challenged students with only a few candidates achieving full marks with many candidates inverting the formulae, although this is given to candidates on the exam formulae section (point 2) of the exam paper. Many candidates did not give the answer in a ratio format and so lost a mark.

(c) **(i)** This question challenged students with only a few candidates achieving full marks with many candidates inverting the formulae, although this is given to candidates on the exam formulae section (point 1) of the exam paper. Error Carried Forward (ECF) was applied to advantage candidates, but centers should remind pupils to use the formula given correctly. Many candidates did not give the answer in a ratio format and marks were lost.

(ii) If candidates had given an incorrect answer to Part (i) ECF was applied. Some candidates failed to realise the need to use their answer to Part (i) and used alternative figures. Candidates should be reminded to give the correct unit of measurement in all calculation answers to achieve full marks.

(d) **(i)** Candidates struggled to give appropriate applications of screw threads to "produce a large force". General applications were given that warranted no marks.

(ii) This question differentiated candidates of various mathematical abilities. Many candidates struggled to manipulate the formulae to give the desired formula and often gave no units of measurement in the answer. Higher-ability candidates answered this question well.

(iii) This question differentiated candidates of various mathematical abilities. Many candidates were able to identify the correct formulae for the circumference of a circle but did not progress the formula to divide by the thread pitch and so could only achieve [3] marks. Higher-ability candidates were able to apply their knowledge and solve the equation gaining full marks.

(iv) Most candidates were able to identify increasing the handle length to gain velocity ratio. However, it should be noted that candidates often only stated "increase effort". Candidates must explicitly explain their suggestions, with clarity, to allow examiners to award the maximum possible marks. Some candidates went on to correctly state decrease thread pitch while others often left this second line blank.

Q2 **(a)** This question was answered well by most candidates. Common errors were naming pressure source as pilot pressure. On a number of occasions, candidates failed to write the full terminology as given in "Table 3" and only recorded "working line", instead of Working line, Return and Feed Line as stated. Candidates should use the full terminology given to gain full marks.

(b) This question was reasonably answered by students with most candidates gaining three out of the four marks. While most candidates drew the correct connection from 3PV A to 3PV B the shuttle valve was often fully omitted, or the connections were incorrect. Flow restrictors were also often drawn which is a common error as in previous years. Pilot pressure lines were also often seen in use, which is not appropriate for this solution.

(c) **(i)** Well answered with most candidates gaining full marks.

(ii) This question was answered reasonably well by the cohort with many candidates gaining three marks out of the four marks. The majority of candidates could explain the sequence and use the appropriate technical terminology and component names. However, their description of the operation of the reservoir often failed to identify its use as a time delay and regularly only referenced the reservoir "filling" with air. Time delay should be specifically referenced when explaining reservoir operation.

(d) **(i)** The required formula for the force is given to candidates on the exam formulae section (point 5) of the exam paper. Many candidates calculated the outstroke force and did not take into account the area taken by the piston arm. ECF was applied in these situations and allowed many candidates to achieve half marks.

(ii) This question was answered well by the cohort with many top candidates gaining full marks. The majority of candidates could explain the operation sequence well and use the appropriate technical terminology and component names. Some candidates explained the DAC outstroke and instroke, but did not specifically discuss that it was slowed, instead saying it was controlled/monitored. Reference to cylinder speed should be in terms of fast/slow etc.

(iii) Well answered with most candidates gaining full marks.

(iv) Many candidates misinterpreted this question and answered with reference to controlling the output speed of the piston. Candidates should be reminded that "stroke" is the length of the piston arm stroke.

(e) This question differentiated candidates of different abilities. Many found this challenging with some leaving this question completely blank. Common mistakes were solid lines used for pilot lines and starting points from the 3/2 valves were not in the correct position. The more able candidates were able to show the required pneumatic circuit using all the additional valves required. The majority drew neat diagrams using a ruler, however, on occasion, this was not the case and made following connection lines difficult for the examiner.

(f) This question differentiated candidates of various abilities. Most candidates attempted a response with varying degrees of success. A few candidates used all the space provided and others only identified an application and left the rest of the lines blank. Higher-ability candidates gave incisive applications with full and in-depth descriptions of the application functions. While descriptions tended to be detailed many candidates did not go on to justify the selection of pneumatics in these applications. Candidates should note that spelling, punctuation and grammar are assessed in this question.

Assessment Unit 2 Option C: Product Design

Unit Overview

Candidates achieved marks which ranged from very low to mid high. The more able candidates accessed top mark bands in individual questions. Weaker candidates were able to access some of the marks across the paper. Generally, the average score of this paper was low. Candidates should be reminded that working out is important should the candidate not get the correct answer, marks can and will be awarded for working out. The language used in the paper was clear and appropriate. There was no evidence that candidates had insufficient time to complete the paper.

Q1 **(a)** A disappointing number of candidates struggled to correctly identify the correct names for the wood joints. Most candidates identified at least one of the joints correctly.

(b) A very small number of candidates correctly identified the mortice and tenon correctly. A small number of candidates inverted X and Y. A large number of candidates did not attempt this question.

(c) **(i)** The majority of candidates identified the difference between the two joints.

(ii) The majority of candidates correctly identified an advantage of the wood joint

Q2 **(a)** Most candidates gained some marks in parts of this question. A number of more able candidates gained full marks. A small number of candidates identified a product made using the different production methods. A common error was using definition and reason for continuous manufacturing instead of mass manufacture.

(b) Generally, well answered. A number of less able candidates identified the jigsaw as a saw but their response was not enough to gain the mark. A small number of candidates misinterpreted planer as planner.

Q3 **(a)** This question differentiated candidates of different abilities. Most candidates achieved some marks to full marks in this question. A small number of candidates did not attempt this question.

(b) This question differentiated candidates of different abilities. Most candidates achieved some marks to full marks in this question.

(c) This question differentiated candidates of different abilities. Most candidates achieved full marks in this question.

Q4 **(a)** **(i)** Very well answered by the majority of candidates.

(ii) Generally, well answered.

(iii) The majority of candidates correctly identified three reasons for using these materials for manufacture.

(iv) Generally, well answered.

(v) Poorly answered by the majority of candidates. Very few candidates demonstrated an ability to define technology push.

Q5 **(a)** **(i)** Very well answered by almost every candidate.

(ii) Generally, very well answered.

(b) **(i)** This question differentiated candidates of different abilities. A small number of candidates achieved full marks in this calculation.

(ii) This question was not attempted by a number of candidates. It was poorly answered by the majority of those that did attempt this calculation. Candidates should be reminded to show their working out to allow marks to be awarded in the cases of an error.

(c) Well attempted by most candidates. Candidates achieved across the full range of marks. A small number of candidates used no annotation in their response.

Q6 **(a)** Well answered.

(b) Generally, well answered.

(c) This question successfully differentiated candidates of different abilities. A small number of candidates listed products made from these materials with no attempt to suggest a reason for the use of this material.

Q7 **(a)** Generally, well answered.

(b) Generally, well answered but candidates should be reminded to consider the number of marks available for each question. A response of 'handle' is not enough to gain two marks in a question requiring a candidate to discuss a design feature of the container.

(c) Poorly answered by most candidates. Top ability candidates accessed the full four marks.

(d) This calculation was well answered by the majority of candidates. Candidates should be reminded to show their working out to allow marks to be awarded in the cases of an error.

Q8 This question successfully differentiated candidates of different abilities. Candidates achieved the full range of marks in this question. Candidates should be reminded to aim to include annotation addressing all features of the design question.

Principal Moderator's Report

Internal Assessment Overview

Candidates across centres engaged well with both themes but it was observed that the 'Fit for Life' theme was slightly more popular. The majority of centres had all administrative documents presented for moderation, work was labelled and laid out in rank order and this helped the moderation process. Most centres with systems projects had access to batteries or power supplies to show a working final prototype. Not all centres had models, jigs and formers on display, but most were able to produce them when requested. These should be displayed for moderation alongside the final manufactured prototype.

Most candidates stayed within the 10 A3 pages limit and most candidates adhered to the required font sizes. Candidates need to be reminded that all sourced images need to be referenced per JCQ guidelines.

It helps the moderation process if portfolio pages are numbered and titled with the headings of the five sections and that pages are collated in the correct order. This is especially important to make it clear where the concept pages finished and development of the solution begins within the portfolios.

It is important moving forward that candidates sign the Portfolio Cover sample sheet so that quality work can continue to be used for Agreement trials.

It was noted that ongoing union action meant many teachers did not annotate the eCRS forms which prevented moderators understanding how marks were allocated. It is important that centres annotate on the eCRS whether additional support was provided to candidates even if no other annotation is provided if ASOS continues through this exam series.

The Agreement Trial this year was pre-recorded and access links for the recording and support materials were provided to centres. Review of annual Agreement Trial support materials is extremely important to ensure that all teachers have access to guidance provided by the senior moderating team, and to gain further clarification of the mark descriptors for this controlled assessment task.

Assessment Unit 3 Design and Manufacturing Project

Design Thinking, Analysis and Specification

Most candidates were able to choose a design theme and appropriately explore possibilities. It was pleasing to see more candidates this year taking time to explore the theme in detail although many candidates could still benefit from this exploration whether by using spider diagrams, client interviews or background research.

Candidates were able to produce design briefs with many producing an initial design brief and a more detailed final brief after analysis and specifications.

Within the problem analysis many candidates are still presenting descriptive annotation where they could benefit from more analytical commentary and making suggestions on how they will use their research analysis in their concepts.

Centres should be encouraging candidates to include measurable points within their specifications as this will help candidates in the testing and evaluation stage of their project. It was noted by moderators that many candidates are making design decisions too early in the process, often including them within their specifications, and this can limit creativity within the concept section.

In some centres, there remains a culture from the legacy specification of candidates presenting generic research on tools, machines and components with little to no link to design thinking, and this should be discouraged.

To comply with JCQ guidelines all reference material should include sources; many candidates are still not referencing images used within this section.

Concepts and Analysis

There was evidence of creativity and creative thinking across many candidates with some excellent freehand sketching being demonstrated. In the best work candidates were able to use 2D, exploded, sectional and zoomed views to show their understanding of the proposed concepts.

Annotation within this section is an area where candidates could be encouraged to include more analytical commentary, as very often the annotation was mainly descriptive or even absent. Candidates need to be demonstrating detailed knowledge and understanding of the concepts they present as often technical detail was not included within sketches or annotation. Some candidates are still very text-heavy in this section which detracts from the sketching on the pages and makes it difficult to see the design thinking that is happening.

A few candidates presented CAD work within this section which did not merit the marks being awarded, and this needs to be clearly communicated within centres. There should be no CAD in this section of the portfolio.

It was noted that a few centres had heavily contextualized the theme which gave candidates limited creative opportunities for their design outcomes, and this should be discouraged. Some candidates had redrawn, or traced, research images as concepts and again this is a practice that needs to be discouraged as it limits the marks candidates will be awarded in this section.

It is important that centres that are undertaking a systems approach to the design solution, present concepts for both the system and the casing in this section. These concepts can be presented as block diagrams, basic circuits and simple flowcharts, and allow scope for development in the next section of the portfolio.

Development of Proposed Concepts: Modelling and Testing

There was evidence of some excellent CAD skills being demonstrated across centres and this is to be commended. Candidates need to be encouraged to produce analytical annotation as often it was descriptive and did not consider a range of appropriate factors.

Plans of manufacture are not required and some candidates used a lot of this section describing how they made their model or how they drew their CAD drawings which gave them limited space within the portfolio to develop their design solution. Analytical annotation on how the model and CAD has helped them develop their solution would have been a better use of the pages.

The quality of freehand sketching varied across candidates and candidates should be encouraged to experiment with a range of sketching techniques which could include 2D, 3D, exploded view and cross-sectional views.

Some candidates who were exploring a systems outcome did not develop either their casing or their circuit from their concept idea and this limited the mark they received. It is important in these centres that all pupils have individual outcomes for their circuit and the development of these are shown within their portfolios.

Most candidates produced appropriate working drawings but not all showed the necessary details to enable the prototype to be manufactured. Key dimensions and parts lists were often missing and some candidates did not produce 3rd angle drawings to BSI standards.

Most candidates used modelling within this section. It is important that pupils test and evaluate their model(s) to show how they inform their design thinking, and it is recommended that modelling occurs early in this section rather than at the end as a final model of the manufactured piece. Candidates who scored in the excellent band in this section used at least one model and showed through additional freehand/CAD drawings how the model had informed changes to their proposed solution. Some candidates produced a model but did not use it as a development tool.

Development of Proposed Concepts: Manufacture

With a return to practical work this year moderators were very complimentary about the practical work they saw in centres, with many candidates producing top band products that were creative, innovative, and functional. However, this section of the controlled assessment seemed to be where teachers struggled with their marking the most.

Many centres used a combination of materials within their manufactured prototypes and many candidates utilised 3D printed parts within their final solutions. The quality of finish in some centres was excellent with polished edges and an excellent fit on joints. The work of the best candidates showed a range of complex processes such as lamination, welding and lathe work while using a variety of materials.

However, quality of finish was an issue for many candidates this year, with little to no consideration being made to the finish on the product which prevented them from achieving top marks. Some candidates who followed the systems approach could have gained marks by securing their PCBs inside the housing and heat shrinking wires and components.

Not all centres had models and/or jigs or formers on display for moderation as requested.

Evaluation

Quite a few candidates clearly ran short of time and did not complete this section or produced a rushed attempt at it. It is important that centres leave enough time after manufacture to complete this final section of the portfolio to maximise the marks the candidate will receive.

The most able candidates used in-situ testing to really test the product and this was evidenced by the inclusion of photos in the portfolio. They were able to evaluate real findings, and this helped them produce analytical, evaluative work in the excellent band.

Many candidates are still copying over the specification to this section which limits space on the page(s) and does not leave room for reflective thought. This is to be discouraged with candidates being encouraged instead to produce analytical and constructive evaluation points and then identify valid modifications for improvement or future development.

The modifications suggested were often suitable but were not communicated through sketches which may have helped to clarify candidate thinking.

Contact details

The following information provides contact details for key staff members:

- **Specification Support Officer: Nuala Tierney**
  (telephone: (028) 9026 1200, extension: 2292, email: ntierney@ccea.org.uk)
- **Officer with Subject Responsibility: Judith Ryan**
  (telephone: (028) 9026 1200, extension: 2133, email: jryan@ccea.org.uk)

COUNCIL FOR THE **CURRICULUM, EXAMINATIONS** AND **ASSESSMENT**
29 Clarendon Road, Clarendon Dock, Belfast BT1 3BG
Tel: +44 (0)28 9026 1200 Fax: +44 (0)28 9026 1234
Email: info@ccea.org.uk Web: www.ccea.org.uk

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