# GCSE EXAMINERS' REPORTS

## DESIGN AND TECHNOLOGY

## SUMMER 2016

© WJEC CBAC Ltd.

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.


| Unit | Page |
|---|---|
| Controlled Assessment | 1 |
| Food Technology | 8 |
| Graphics Products | 13 |
| Resistant Materials Technology | 18 |
| Systems and Control | 22 |
| Textiles | 27 |
| Product Design | 32 |


© WJEC CBAC Ltd.

# DESIGN AND TECHNOLOGY

## General Certificate of Secondary Education

## Summer 2016

## CONTROLLED ASSESSMENT

### General Comments

This year marks the sixth year where the Controlled Assessment Task (CAT) has been undertaken in centres. This is now settled and well established in most centres, where teachers and candidates are comfortable with the demands and challenging presented with this method of assessment. There have been a large number of new centres using WJEC this year for the first time.

Candidates and centres must be congratulated for their hard work in completing tasks to the standards witnessed by moderators this year. There are an increasing number of valuable resources to be used to support the CAT delivery and assessment for both teachers and candidates, including the OER (Online Examination Review) where each focus area has marked CAT pages available for teachers and candidates to consider. Overall, it appears the standard of work in general has improved this year; there were some excellent examples of innovative and creative designing and manufacturing in centres, with candidates achieving very high marks. Testament to this, the 2016 Innovation Awards will feature 30 GCSE projects on exhibition as a result of the very high standard and large number of excellent entries from Welsh centres this year. Teachers are reminded that the attendance of staff and pupils to the Innovation Exhibition is critically important both for development of Design and Technology in centres and to support this showcase event. The Cardiff and Bangor exhibitions will again provide free teachers CPDs, seminars for students and exhibit sector leading exemplar projects at GCSE, AS and A Level.

### Assessment of CAT work

In general, the majority of centres apply the assessment criteria consistently and fairly across all candidates in all focus areas. There are instances where marks are generous, and in few cases, rather harsh on candidates where they may deserve slightly more. Internal cross moderation remains an area for further development within centres. It is clear and evident that when an adjustment is required to bring candidates in-line with the national standard, this is often in one focus area in a centre which is delivering multiple focus areas with various classes and teachers. Some centres would benefit from an internal discussion on standards, considering candidate outcomes and the detailed marking criteria, and then the application of that agreed standard to all candidates in all focus areas. The likelihood of one focus area being over generous or harsh will be much reduced, and as such, less adjustment will be necessary.

© WJEC CBAC Ltd.

## Delivery Issues

Centres largely comply with the instructions for delivering and assessing CAT work. However, this year it was evident that there were some issues relating to procedures and managing CATs in centres.

(i) **Centres must use the CAT dated for the year of the award**. A small number of centres failed to use the correctly dates CAT workbook sheets. This presents issues regarding task taking and raises questions regarding the 'control' of the task taking.

(ii) **Centres must adhere to the 3 set briefs published each year.** The vast majority of centres comply with the set briefs, and produce outcomes within the spirit of the assessment.

(iii) **Prepare for Moderation.** Communication via email is critical in organising moderation dates and times. A number of centres failed to display work effectively this year with a lack of organising and managing the moderation process. Centres are responsible for ensuring effective communication between WJEC and themselves in order to present the generated sample of work for the visiting moderator. Contact must be made if there are any issues to jeopardise this process.

(iv) **15 page A3 CAT workbook**. A very small number of candidates amended or added to pages when completing designing pages in the CAT workbook. Working on any materials outside the page frame will not be considered part of the CAT. Fold out parts, notes on the back of pages, duplicate pages etc. will be ignored by the moderator.

(v) Writing frames given to candidates to help completion of pages constitutes support and guidance. This will therefore reduce the marks awarded when compared to a candidate who has worked without support, guidance or a writing frame.

## Administrative Issues

The Notes for Teachers clearly sets out the requirements for assessing and authenticating candidates work in a standardised manner. There appeared to be some areas of uncertainty for centres which resulted in some modifications, additions or replacements for some paperwork during moderation days. In order to host a 'problem free' moderation day, the following is suggested:

(i) Once marking is complete, the sample is generated automatically when all marks are entered via www.wjecservices.co.uk. Centres must then print a hard copy of the WHOLE entry for each focus area, and print a SAMPLE for each focus area. It is then clear to moderators how the sample represents the whole entry, and whether other candidates work outside the sample may be required.

(ii) All DT2 forms must bear the Candidate and Centre Name and Number, Focus Areas highlighted, Brief Number highlighted and a Candidate and Teacher authentication signature.

© WJEC CBAC Ltd.

(iii) The justification of the mark awarded to candidates by a centre is critical. For designing pages, supporting comments should be added to the bottom of CAT pages. This is an opportunity to support the marks awarded by giving some reasons. This helps the moderator agree with centre marks. For making marks (M1 to M6) the DT2 has areas for brief supporting comments.

(iv) For the moderation display, the sample should be presented in rank order using the generated sample sheet. The DT2 should be attached to the front cover. Page 15 should contain 4 photographs of the artefact/s made. All product/s should be available to support design folios. Work from outside the sample still needs to be available to the moderator and may be requested. No CAT work, design based or practical, should be removed from the centre before November after the award.

## COMMENTARY ON THE CAT WORKBOOK

### Pages 1 to 4

Candidates analyse products well. This page allows candidates to report on investigations and research in a realistic timeframe. The analysis / disassembly of a competitor product could be more detailed in some cases.
Specifications could be improved. The majority do not use measurable data when presenting Design Specifications. Sizes, weights, costs, and tolerances can all allow candidates to access higher marks by adding numerical data to criteria. It also provides a clear set of tests during the Evaluation process. SMART specification criteria require some additional thought, so candidates need to develop specification points into meaningful designing parameters. E.g. ..*It must be safe to hold..* is a low level response, whereas ..*it must be no larger than 100mm x 45mm x 20mm so that it safely fits in the users hand…* is a more developed and higher level response.
Initial ideas require 4 appropriate concepts that reflect the specification criteria. The best features from these ideas are then 'morphed' into a best idea on page 4.

*The assessment of the D&T content and the QWC was usually accurate.*

© WJEC CBAC Ltd.

**Pages 5 to 9**
The development pages have improved progressively in the last few years. Candidates need to develop ideas, and this needs to be done using modelling, testing, experimenting and reflecting. Tables of words are not really idea development. The assessment scheme clearly shows that the marks from 2 to 5 can only be awarded if a candidate has explored a number of possibilities and made a decision based on analysis. Many candidates fail to offer options and alternatives and as a result access low marks. If a narrow and 'thin' approach is evident throughout the development pages, candidates are failing to access the majority of the marks available. **This is an area where moderators generally disagree with centre marks because the candidates work does not fit the assessment descriptors.** It is the intention that development pages contain notes, sketches, diagrams, models and testing. These pages should 'tell a story' of how ideas are being refined. This year, moderators saw some very 'wordy' development sheets, with information often presented in tables, which offered possibilities and decisions with little or no reference to sketches of the ideas. This approach prevented candidates from understanding the constructional details, form, components required and possible sizes of their ideas and only limited development could take place as a result.

*The assessment of these pages was usually generous. Centres must only award high marks if the work presented clearly meets the descriptor. If work does not match the descriptor, a lower mark should be given.*

**Pages 10 and 11**
These pages are the final detailing required to visualise products, and also clearly understand technical details such as dimensions, assembly methods, fixtures and fittings etc. An effective approach is for candidates to consider:

(i) Page 10 is where the final proposal is presented to a client. A highly visual representation of the concept. Colour renderings and CAD generated images work well here.

(ii) Page 11 is where all the engineering drawings, sizes, measurements, assembly details are presented. Anything a manufacturer would need to make the product drawn on page 10 needs to be presented here.

Together, these pages should give enough detail for a manufacturer to produce their product/s without consultation to the designer. If sufficient details are present, high marks may be awarded. To award four marks the assessment scheme states: "A **very good graphical presentation** of the final product. It **uses a recognised graphical technique**, is **accurate in its structure** and it shows **effective shading and / or colour rendering**." A simple sketch will not fulfil these requirements.

Centres are reminded that these pages impact on the Dimensional Accuracy mark awarded in the making of the product.

*The assessment of page 10 was often generous with poor quality illustrations awarded high marks.*

**CREATIVE THINKING**

This mark is available for any evidence of creativity throughout the designing and development process. There may be innovative use of materials in designing. Sketching and development of form may be very imaginative and artistic. Candidates may approach function divergently and have a product with inventive features. There may be a clever use of a manufacturing method or process in the development of construction. Candidates should be rewarded for their creative thinking wherever it occurs.

*Centres appear to be comfortable and confident when marking Creative Thinking. It is not an area where Moderators generally disagree with Centres. The assessment of this aspect was usually accurate.*

© WJEC CBAC Ltd.

**Page 12**
Planning is probably still the weakest sheet within the CAT workbook. Few candidates presented fully detailed manufacturing stages, with time constraints, equipment and tools required, and details of the practical activities that would take place. Many candidates presented a retrospective 'diary' of what they had done to make their product. This is not a plan and will only fit the 1 – 2 mark descriptor.
Centres should note that to award more than 7 marks "A list of realistic manufacturing steps is evident detail of the processes required… a realistic estimate of the time needed to manufacture the outcome." A simplistic Gantt chart with basic details is not enough to access 7 marks. Moderators frequently adjusted centre marks in this area.

*The assessment of the D&T content and the QWC was usually generous. Adjustments were common in Planning.*

**Pages 13 and 14**
Evaluations are generally good. They must be presented as continuous writing, and candidates who use bullet points or table with ticks and crosses are penalised here. The quality of QWC is critical to accessing higher marks. Candidates with well-structured specifications find the analysis easier because they have clear criteria to measure the product/s against. Where specifications are weak, basic or limited it is difficulty for candidates to establish how far they have or have not met their design intentions and the target markets requirements. Writing frames are discouraged here because they structure candidates work, and often this support and guidance is not reflected in the marks awarded.

Modifications pages are often repetitive and reflect similar features from the evaluations. This page is an opportunity to further develop solutions, to modify and re-design aspects which have been criticised in the Evaluation. Candidates should follow on from the evaluation and 'put right what is wrong' rather than accept that the project has ended. There were some very good examples where candidates had produced sketches and diagrams of alterations and changes that would further improve proposals. These gained higher marks. There is a tendency for weaker candidates to 'run out of steam' during pages 13 and 14 and gain low marks. There are 20 marks available for these pages and time must be allocated to complete the pages as fully as possible.

*The assessment of the D&T content and the QWC was sometimes generous. Centres must award marks for work that fits the descriptors clearly, so that moderators will not have to recommend adjustment of the marks awarded by the centre.*

**MAKING**
There are 90 marks available for candidates to access when manufacturing the product/s that they have designed, developed and presented in the CAT workbook.

**Range & Difficulty of practical processes**
Candidates must demonstrate several accurate practical processes that would be considered demanding or challenging for GCSE students in order to access high marks here. Simplistic processes will not allow high marks to be gained. Repetitive processes will not allow high marks to be gained. Wholly CAM projects with one process, like laser cutting, will not allow the range of processes to be accessed. Candidates should use CAM with other methods of manufacturing where appropriate in order to demonstrate the variety required. Most centres awarded marks correctly in this section but some centres awarded high marks for simple and repetitive making processes which did not meet the assessment descriptors.

*The assessment of this aspect was usually generous and the award of marks needs to be reviewed by centres so that moderators will not have to recommend adjustment of the marks awarded by the centre*.

© WJEC CBAC Ltd.

**Quality of Making**
This mark relates to the levels of accuracy achieved by candidates in their practical outcomes. A common problem is that centres award high marks for products that are generally adequate, and the levels of accuracy are quite low. Also, some centres award inflated marks for partly complete products.
To access 11 to 15 marks, the assessment descriptor states “An adequate level of accuracy is evident in some aspects of the construction/making”. If the work is unfinished but what has been done is very well then this is the maximum mark range that can be awarded. Poor quality making would of course gain a lower mark.

*The assessment of this aspect was usually generous and the award of marks needs to reflect the assessment descriptor so that moderators will not have to adjust the marks awarded by the centre*.

**Dimensional accuracy**
This factor caused problems again this year. This mark is for candidates producing their proposal that has been presented on pages 10 and 11. If pages 10 and 11 are blank or incomplete then a lower mark is likely because it is impossible to evaluate how close to their intentions candidates have worked. Moderators will consider work on pages 5 to 9 to see if information about the final design proposal is present in considerable detail and award some marks. Centres must provide a full justification on the DT2 if this occurs, but even with very full and detailed development pages, no more than 6 marks should be awarded.

*The assessment of this aspect was usually generous and the award of marks needs to reflect the assessment descriptor fully so that moderators will not have to recommend adjustment of the centre marks.*

**Quality of Finish / Appearance**
This aspect of making has proven to be clearly understood by centres and candidates work is consistently and accurately assessed.

*Moderators generally agree with centre marks here.*

**Function**
This aspect of the assessment caused problems this year. It is not possible to award high marks here if the Final Brief and Design Specification are not detailed about the function of the product. The major problem is that candidates do not provide enough details on pages 1 and 2 to cover what the exact function of the product needs to be. Again, it is then impossible to determine whether a product functions without a frame of reference to compare it to. The assessment scheme states that for a mark of 3 or 4 to be awarded “The product functions to a limited extent.” This would be the correct mark band when the brief and specification are limited, basic or lack detail. If a candidate has a detailed brief and comprehensive measurable criteria in the specification and the product meets all of these intentions then a high mark can be awarded.

*The assessment of this aspect was usually generous. Marks needs to reflect the assessment descriptor so that moderators will not have to recommend adjustment of the marks awarded by the centre.*

**INDEPENDENT WORKING**
This mark is a reflection of how well the candidate has produced the product by following their plan of manufacture. The amount of support, guidance, help and assistance given here will affect the mark awarded. It is likely that the sample in a centre will contain candidates who have had varying levels of teacher support. Therefore, not all candidates will be awarded the full 15 marks here. Thus said, some centres ignore the assessment descriptors and award all candidates 15 marks. Moderators are unlikely to accept these marks unless the sample consists of very high achieving candidates with very detailed planning pages.

© WJEC CBAC Ltd.

When making a judgement of the marks to be awarded the following should be borne in mind:

(i) Marks awarded are for following the plan on page 12. A candidate is likely to need support and guidance if the plan produced is basic, lack depth and does not clearly define the production stages in detail.

(ii) The degree of intervention the teacher needed to make is crucial in making the judgement.

(iii) An incomplete product cannot be awarded all 15 marks as the candidate has not worked independently to the plan to produce a complete product.

It is expected that most candidates will be awarded 7 to 9 marks as the assessment scheme states “The candidate has required some support and advice during the making of the product.” If a higher mark is awarded then the centre must provide a detailed justification on the DT2 that explains the independence and self-sufficient candidate.

*The assessment of this aspect was usually generous and the awarding of marks needs to reflect the assessment descriptor so that moderators will not have to recommend adjustment of the marks awarded by the centre.*

Finally, I wish to thank centres for producing such good quality work overall. Although this report focuses on many of the shortcomings from the 2016 CAT moderation, the process was very positive for both centres and moderators. At this particularly busy and stressful climax to the year, the standard of work presented continues to uplift all parties involved. I hope the visiting moderation process remains a constructive mechanism to ensure that candidates work meets the expected standards and that centres are supported in order to improve candidate performance in future.

© WJEC CBAC Ltd.

**DESIGN AND TECHNOLOGY**

**General Certificate of Secondary Education**

**Summer 2016**

**FOOD TECHNOLOGY**

## General comments

The examination paper this year appears to have been as accessible as 2015. The paper was challenging in that it covered a broad range of topics contained within the specification content. The style of questions set within the paper varied considerably to enable all candidates of different abilities accessibility.

Centres must encourage candidates to take the time to carefully read the questions set as this could reduce many of the incorrect responses put forward by candidates. All centres must continue to ensure that preparation for the examination is thorough and detailed. Candidates should be given opportunities to complete past papers and practise questions related to the different specification areas to enable them to understand the depth of knowledge required and the difference between a basic and developed response. Centres are encouraged to make use of the Online Examination Review which is available via the WJEC website. This e-resource provides marked exemplar scripts which include examiners marks with comments on why marks have been awarded and reasons why some responses have not gained marks. Example exam questions accompanied by the marking criteria are available for classroom use.

Centres are encouraged to use the Item Level Data to assist in analysing the performance of individual candidates and the performance of the entry from the centre in order to identify strong successful areas and also any specification content that needs further development.

## Q.1 Product Analysis

This question was well attempted by the majority of candidates, but the performance in some questions was quite poor.

(a)&(b) Most candidates were able to identify the correct number of calories a half portion of the salmon and potato bake would provide as well as provide a good reason for the bake being sold in the foil tray.

(c) Many candidates failed to recognise the bake as being diet related with controlled calories and targeted nutrients therefore they were not able to identify a suitable target group and clearly explain why the product would be appealing to them.

(d) Many candidates gained one mark for providing a suitable reason for using the tomato passata. Just stating the fresh diced tomatoes was to provide ‘flavour and texture’ is not sufficient to gain marks.

© WJEC CBAC Ltd.

(e) (i) Many candidates were able to recognise the range of colours used in the product: red sauce, creamy potatoes, or the presentation of the potato slices and sprinkling of the herbs and discuss these in relation to the aesthetic appeal of the product.

(ii) Some candidates were able to secure one mark by correctly identify the potatoes as being a bulky/filling food as well as source of carbohydrates. Developed responses discussed slow release energy, vegetables that provided low calories and the meal being balanced or controlled to provide sufficient calories and prevent the eater from feeling hungry after consuming.

(f) They were some errors in the calculation. Many candidates failed to correctly add up the total sales for June- September which then led to an incorrect calculation for the average sales per month. Many candidates gained one mark with the correct addition for sales and workings shown, but did not calculate the average sales correctly. Candidates must be encouraged to include all workings.

**Q.2 General Issues**

This question was accessible for many candidates.

(a) No real issues with the identification of true or false statements. However there were an increased number of candidates who did not attempt the question, this style of question is designed to be accessible for abilities.

(b) (i) Allergies was the most popular answer identified by the majority of candidates.

(ii) Many candidates were able to correctly identify the ingredients should be presented with the largest amount listed first. Some candidates secured both marks by including descending order of weight. Many candidates discussed ‘text used should be clear’ or allergy information must be clearly stated these were not suitable responses.

(c) Many candidates were able to recognise the macaroni cheese was high in fat. Many developed responses discussed looking for a healthier option; candidates must be more specific to gain the mark. A high number of candidates focused on the sugar content which was not related to the savoury dish.

(d) Nearly all candidates could put forward a basic explanation of the term food miles. To gain the full 3 marks, candidates needed to discuss the full distance of travel – from field to plate and the impact on the environment.

© WJEC CBAC Ltd.

## Q.3 Designers Essay

The essay question is still proving to be quite demanding and challenging for some candidates. There is still only a small number of candidates achieving the full 10 marks.

(a) The majority of candidates were able to correctly name each designer.

(b) Jamie Oliver was the most popular designer with the candidates. There were some very good, well written responses. Some of the candidates' responses are still very factual and discuss the designers' career which does not answer the question set. Some centres are teaching their candidates to continue writing their essay on both continuation pages at the back of the paper. This is not necessary; candidates should be encouraged to compile a concise, factual essay on the fifteen lines provided.

## Q.4 Designing and Design Question

Many candidates did not access the full 7 marks available in the first section of this question. Candidates must apply the knowledge they gained from completing the CAT and consider the process they have gone through when answering this question.

(a) Many candidates were able to match the correct term to each meaning. There were an increased number of candidates who failed to attempt the question.

(b) Many gained a mark for identifying a reason for using a questionnaire. To find out peoples likes and dislikes was a popular answer.

(c) The majority of candidates failed to read the question correctly and lost valuable marks. Candidates produce a design specification on page 2 of the CAT; the question was asking why this is important. Correct responses made reference to identifying what the product must do – function, or the identification of essential points/criteria that act as a guide when designing.

(d) Normally this part of the question is generally completed well. This year many candidates did not read the question carefully which led to meals being put forward which were not one dish, or included salad or coleslaw which is not suitable for serving hot. Suitable suggested dishes included lasagne or hotpot type dishes. Candidates must be encouraged to clearly label ingredients used and include information requested such as nutritional value, or the texture the ingredient will provide in the dish. Many marks are lost due to candidates not relating to the 'marks will be awarded for section'. This section of the question carries 18 marks and candidates must practise it so that they become familiar with the layout and demands of the question.

© WJEC CBAC Ltd.

## Q.5 Commercial Manufacturing

Most candidates scored well on this question.

(a) The majority of candidates were able to identify two scales of production.

(b) (i) Many candidates were able to gain the full 2 marks.

(ii) Most candidates were able to secure one mark with an answer related to the presentation/positioning of the foods. Some candidates secured two marks by discussing consistent standards or the opportunity for visual checks.

(c) Nearly all candidates could provide a basic explanation of the term assemble.

(d) Many candidates provided a 'stock' response from previous exam papers and mark schemes on batch production which did not fully answer the question but gained them some marks. Candidates failed to recognise the limited edition aspect of the question and how important it would be to trail the product first to see how well it sells before bigger batches are produced. Candidates do not gain marks for simple responses such as 'quicker' or 'easier'.

## Q.6 Materials and Components

For many candidates functions of materials and changes in ingredients/materials that take place due to conditions or environments proves to be problematic.

(a) Many candidates were able to identify the correct flour used to make each product. As previously seen in the paper there were an increased number of candidates who failed to attempt the question.

(b) Some candidates achieved full marks. Many candidates put the flour and yeast function the wrong way round. Some candidates ticked all boxes; candidates must be encouraged to just tick one function.

(c) Many candidates identified a reason for using the pre-prepared pastry and gained one mark, but were not able to develop the same response for the full two marks.

(d) (i) Jam was the most popular answer provided by candidates.

(ii) Limited candidates were able to identify that the high sugar concentration helps to prevent the growth of micro-organisms.

(e) (i) Many candidates failed to identify foam as the type of structure. Set was a common answer.

(ii) Some candidates were able to secure one of the three marks available by recognising that the egg whites are whisked, a few continued with a developed response by including comments on aeration or the addition of sugar. The third mark proved more challenging to most candidates as they were not able to fully discuss the protein being stretched and the sugar helping the foam remain stable when heated. Many candidates lost marks as they misread the question and discussed how you pipe the meringue mixture to make a nest.

© WJEC CBAC Ltd.

## Q.7 Tools, Equipment and Making

Generally a very accessible question, once again visual images assisted candidates when answering questions.

(a) Most candidates struggled to name the ravioli cutter.

(b) (i) The majority of candidates gained full marks.

(ii) Some tips on successful pastry making were listed. Many candidates incorrectly identified blind baking and chill before baking. The question was related to the making process.

(iii) Many candidates dropped silly marks because they did not clearly identify how to improve/develop the pie. Add a glaze or add a vegetable were not sufficient to gain the marks.

(c) Required knowledge in relation to the two methods used. Many candidates gained one or two of the four marks available by making a comparison between the two methods; creaming the fat and sugar together was a common response as well as putting all the ingredients in the bowl for the all in one and mixing. Many candidates got confused with cake making methods and discussed the whisking method. The differences between the two sponges were discussed by many candidates this was not a correct response for the question asked.

## Q.8 ICT, CAD, CAM, Systems and Processes

Many candidates demonstrated a lack of knowledge and understanding when answering this question which led to marks being lost too easily.

(a) Nearly all candidates correctly identified the true and false statements.

(b) It was disappointing to see the number of candidates who were not able to identify the three main stages of a production system. Many candidates related their answer to designing stages.

(c) The two questions were based on CAD and as in previous exams with this style of question responses can be limited. Many candidates dropped silly marks because they just repeated the stem of the question for their answer. The question was asking about the benefits of using CAD and many candidates just gave a limited response about what CAD means.

(d) Most candidates were able to identify that timing, weights of ingredients, decisions or quality checks would be included on a more detailed flow chart.

(e) Many candidates were able to gain one of the four marks available by referring to one example answer such as; machines can work without breaks unlike a worker. Some candidates were able to develop their response by also discussing that machines can work for 24/7 without stopping or having a break which will increase the volume of goods produced, whereas a worker would have to stop for breaks. Many candidates were not able to provide a developed response, discussing two very different points in very basic detail. Centres must teach candidates how to answer questions of this nature that require one point to be discussed in full detail. Once again responses such as ‘it’s quicker’ or ‘it is cheaper’ do not gain any marks.

© WJEC CBAC Ltd.

## DESIGN AND TECHNOLOGY

## General Certificate of Secondary Education

## Summer 2016

## GRAPHIC PRODUCTS

### General comments

The Graphic Products examination was again well received by the majority of candidates this year. Many candidates showed that they had a good knowledge and understanding of certain aspects and good graphical skills and techniques. This is testament to the hard work that is done in centres by staff to ensure candidates success. There were however, some candidates that failed to show a deeper understanding of the course and as a consequence could not access the full set of marks available. Section A is usually where candidates perform best. This was true again this year. Very good understanding and knowledge were shown in most of the questions parts. Most candidates gave a good account of the designers work; they failed to access the full marks as they could not discuss the influences the designers had. It was pleasing to see some quality responses in question 4; this to be expected of Graphic products candidates. The number of poor to medium quality of graphical answers was disappointing and surprising, outweighing the good. Section B had many aspects that have been tested repeatedly over the years. It would be expected; therefore, that this section be responded to well, unfortunately, in general it was not. Where good responses were seen it is pleasing that the quality of answers was very good.

There was a surprising lack of knowledge in fundamental aspects of the course. The inability to identify something as elemental as the printing process or have an understanding of what was done at Pre-press stage in printing was a surprise. When tested on some basic geometrical construction on question 8 (Sign), it is alarming that graphics candidates cannot execute such basic skills. Only a few were seen that could present a good answer. At worst a sketch was offered, gaining no marks. Does this suggest that all work in the course is done on computers? It needs to be remembered that the course and specification requires a range of techniques and skills.

As was stated at the beginning there are centres that deliver the course well. However, I would like to reiterate what was said in last year's report, which is for the need for centres to be paying attention to the specification content in year 11 as well as year 10. Time can be an issue; it needs to be managed well. There needs to be effective time management to allow for revision of skills and knowledge.

© WJEC CBAC Ltd.

## Section A

### Q.1 Product Analysis – 15 marks

(a) (i) Some know about appropriate properties of materials.

(ii) Duplex seemed to be an alien concept to some, those who knew gave good clear answers.

(b) Not many were linking the raisins to healthy eating. Most seem to relate to the fact that they were for children; this was explained in the question. Novelty of packaging was mentioned by some.

(c) (i) In general this was poorly answered. It was surprising that not many were relating to quantity and quality of finished product.

(ii) The answers here were confused. It was missed by most that the issue was with producing the product **by the company**. Misreading led to the inappropriate answers that were offered.

(iii) Very few identified that the products would become collectors' items one day. Most seemed to believe that parents buying for their child would be the most likely reason.

(d) (i) The majority got 6,000.

(ii) Most understood the simple mathematical percentage calculation. Some started the calculations but failed to conclude with the correct answer.

### Q.2 General Issues – 10 marks

(a) (i) + (ii) It was pleasing to see that the majority understood the organisations role and could easily and correctly identify the logos.

(b) (i) Good overall understanding of LCA. Most could identify the cycle and it application to product design.

(ii) Not many understood sustainability. This was not answered well. Most related to materials, only a few could show greater understanding by referring to organisations such as the FSC.

(c) This was the poorest answered aspect of this question. The majority of answers could not truly identify the principles that the Packaging Regulation promotes.

### Q.3 Designers – 10 marks

(a) The majority were able to correctly identify the designers.

(b) The essays were fairly evenly attempted between both the designers. There were a lot of basic content relating to the work of both designers which were written well. Again candidates offer biographical information relating to their birthplace and where they were educated, this gained no marks and in effect the candidates penalised themselves in using time and writing space. Those who scored highly were able to articulate well the information regarding their work and more importantly how this has affected the world of design. Not many mentioned the latter.

© WJEC CBAC Ltd.

## Q.4 Design problem – 25 marks

(a) (i) There was good reference and understanding to types of research.

(ii) Most were able to identify correctly areas of the design specification.

(b) Planning consideration was in general quite poorly attempted. There were a few correct indications relating to materials and cost, very few mentioned time or resources. Some misunderstood the requirement of the question totally.

(c) (i) Some good logos were seen. Very few well drawn examples were seen. Most were able to link the Eco theme.

(ii) Most candidates attempted an answer which was either a bag or a box. The questions required a more innovative approach than this and due to this were not able to score highly. There were a few very original methods of display and package. Totally original and innovative answers were very rare. Some again misread and produced adverts!

(iii) When asked to give detail about the product it was surprising that the knowledge seemed poor on such detail. It was hoped that more would be offered in terms of a net, material details, finish etc.

(iv) Nearly all candidates did very well here and clearly show the details of the logo, bar code etc.

(v) Surprisingly very few scored highly here. It has to be remembered that communicating the idea effectively requires a lot of information, written and graphical.

## Section B

## Q.5 Commercial Manufacturing Processes – 10 marks

(a) The vast majority could pair up the correct terminology.

(b) Some identified the correct printing process. It is surprising that this was not known by more.

(c) Quality control was surprisingly not understood. Where candidate knew the correct application, they would mention registration marks, colour bars etc.

(d) Some knew the method of UV spot varnishing. Very few could give a detailed answer. Most were vague repeating parts of the question.

(e) Pre-press surprisingly poorly explained and understood.

© WJEC CBAC Ltd.

**Q.6 Materials and components – 15 marks**

(a) Paper and boards were identified well.

(b) Approximately half could identify Tint and Tone correctly.

(c) The answers here made reference to explaining how the colours are suitable for various applications. The majority had an understanding of mood and feeling with colours. There should be further understanding under the terms progressive and regressive.

(d) (i) Typographical terminology could be identified well by most.

(ii) Very mixed quality, most understood what serifs were, either a slab or triangular shape drawn.

(e) There were some very good examples when the answers were correct mentioning in detail examples. Most had an indication of small, but could not relate the answer to an actual example.

**Q.7 Tools, Equipment and Making – 20 marks**

(a) (i) Some did identify the scanner, but it seems that there aren't many scanners around these days.

(ii) Rendering seemed a mystery to some. Not many could give good answers here. Pencils, fineliner and software were some of the best answers.

(b) Most identified embossing and debossing. Some creative answers thought the item to be a paper weight.

(c) Health and Safety in Graphic Products is always a difficult topic to identify. Those candidates that could, made reference to general issues with liquids and electricity.

(d) (i) Most identified vector software or an appropriate software.

(ii) Reasons for the use were not clearly expressed. Most that did well were able to differentiate between pixels and coordinates and that scaling would be better with vector.

(e) (i) Only a few knew the Bezier name. Approximately ten were seen.

(ii) Some had a good grasp that the nodes were used to adjust the curve of the line.

(iii) Most understood that increasing the amount of pixels would improve the clarity of the image.

(iv) Some had a grasp of levels; very few fully understood what would happen when levels were adjusted.

(v) A good number had a good grasp of the use of layers in graphical editing software. A good understanding was shown that parts of an image could be separated and edited.

© WJEC CBAC Ltd.

**Q.8 ICT, CAD, CAM, Systems and Processes – 15 marks.**

(a) The majority were able to identify the file formats correctly.

(b) It was surprising the number could not number the pages correctly. There should be an easy technique to allow candidates to decipher the correct number layout.

(c) Not many got full marks for this geometry. What should be a fairly simple construction repeated, was poorly executed. A simple sketch scored no marks. It is worrying that candidates could not apply simple geometry skills to construct the shapes.

(d) A few very good answers were seen. Very few were able to identify that the truncated pentagonal pyramid had a sloping top face. Some offered a one point perspective answer which gained some marks.

© WJEC CBAC Ltd.

## DESIGN & TECHNOLOGY

### General Certificate of Secondary Education

### Summer 2016

### RESISTANT MATERIALS TECHNOLOGY

## General comments

There were 5162 students who sat the Resistant Materials paper this year, a reduction of just over a 1000 students compared to previous years. The cohort continues to be predominantly male.
The paper was well received with very few enquiries about its content being received by the WJEC. It was designed to be accessible to all whilst also being challenging to candidates of higher abilities. This aim proved to be successful with respect to the first part of the paper but, in many cases, a lack of knowledge hindered candidate's ability to answer many of the questions posed in part two. It seems that many centres concentrated on maximising their student's performance or even completing the Controlled Assessment Task and either ran out of time or depended on the students themselves to revise for the examination. Design and Technology departments increasingly find it difficult to fit in the 30 hours plus preparation time necessary to complete the CAT during year 11. Students are regularly being withdrawn from Resistant Material lessons to revise and sit examinations in core subjects.

In many cases candidates started the paper well, their responses to questions 1 to 4 often displaying maturity and common sense. However, following a positive start, and in an alarmingly high number of instances, candidates struggled with the remainder of the paper. It is again evident that the centres with the best performing candidates are those in which the specification has been systematically taught during year 10 and time has been found to revise thoroughly prior to sitting the examination.

A variety of free resources are available to aid teachers in their delivery of the RMT specification. A comprehensive series of multimedia materials can be accessed from the hwb.wales.gov.uk website.

As well as Item Level Data, which is, centre specific and allows a full statistical breakdown of candidate performance question by question, with all marks awarded for individual questions. Centres can also compare their performance against all centres to identify strengths and weaknesses in delivery of this specification. The Online Examination Review 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.

© WJEC CBAC Ltd.

**GENERAL POINTS FROM THE EXAMINATION PAPER:**

**Q.1 Product Analysis – worth 15 marks; the questions were based around the analysis of a Primary school coat rack.**

(a) This proved to be a fairly accessible starter question with the vast majority of candidates being able to gain marks even though many wrote a specification point rather explaining how the given point had been achieved.

(b) The question asked for advantages to the manufacturer whilst candidates often spoke about disadvantages to the customer. Some candidates start 2, 3 and 4 mark questions such as this by repeating the stem of the question in their own answer. This fills up most of the available space and is a pointless exercise as no marks are gained.

(c) The straightforward sum required for part (i) was mostly formulated and answered correctly. Part (ii) was less well answered with many candidates able to work out the comparison between buying a single and multiple unit namely 88% for 1 mark but not then going on to calculate the percentage saving of 12%.

(d) Most candidates gained marks here according to their abilities with some discussing economy of scale whilst others wrote about the advantages gained by manufacturing products in bulk.

**Q.2 General Issues – worth 10 marks**

(a) This question on the 6Rs was generally well answered with a general understanding of the difference between recycling and reusing shown by many.

(b) Extended answers gaining the full 2 marks were fairly rare here. Most answers were simple assertions such as "It causes less pollution".

(c) Limited understanding of the purpose of a Life Cycle Analysis was apparent here with candidates from some centres confusing it with the Product Life Cycle which is not included in the RMT specification.

**Q.3 Designers – worth 10 marks**

(a) Virtually all were able to name the correct designer of the two products shown.

(b) This is the first time that Bethan Gray has been one of the named designers. This year candidates were allowed to write an essay on their designer of choice. It was pleasing to note that a fairly equal number chose to write their essay on each of the two designers. However, once again many devoted a large part of their essay to personal facts about the designer such as their early life and education even though the question asked for a description of their work and their approach to designing. Centres are also reminded that the quality of the candidates written communication is assessed here as part of the possible 8 marks that can be awarded.

© WJEC CBAC Ltd.

## Q.4 Design process – worth 25 marks

(a) Candidates generally showed a satisfactory understanding of the design process in their responses here. Of the 3 missing design stages that were called for to complete the table (Research, Initial Ideas and Planning) planning was the most common stage to be incorrectly identified.

(b) Most candidates were able to gain 1 mark for this question. Fewer were able to justify their initial statements or to list more than one valid reason.

(c) Again a question that relied more on common sense rather than revision with 1 mark out of the 2 available being most commonly awarded.

(d) The design question was understood by the vast majority of candidates. Very few misinterpreted the nature of the design challenge or did not attempt to answer the question. Candidates of all abilities sketched and annotated relevant responses and as a result gained marks appropriate to their abilities. There was evidence of good practice to be seen here, in that centres are now encouraging candidates to practise this question with many using the technique of cross-checking their answer against the Specification points and the list of "Marks will be awarded for". Fewer candidates are neglecting to dimension their solutions and most label their materials with specific rather than generic titles. Centre should note that no marks were allowed for repeating materials and dimensions that are given in the question.

## Q.5 Commercial manufacturing processes – worth 10 marks

(a) Blow moulding and vacuum forming were commonly identified, extrusion and rotational moulding less so.

(b) There was a very poor understanding about the difference between quality assurance and quality control. Most candidates wrote about quality control.

(c) Wood laminating was often confused with steam bending and surface lamination. It is also apparent that many candidates confuse the purpose of formers and jigs.

## Q.6 Materials and components – worth 15 marks

(a) Magnetic catch was often correctly identified. The self-tapping screw and pop rivet less so.

(b) Again Kevlar and carbon fibre often gained marks, Tungsten carbide did not.

(c) These two common properties of materials have not been covered by many centres. Ductility is not well understood and toughness is often confused with hardness

(d) Many explained that MDF is manufactured by mixing wood fibres/'sawdust' with resin/ glue for 1 mark but a more extended knowledge of the process was not often demonstrated.

© WJEC CBAC Ltd.

## Q.7 Tools, equipment and making – worth 20 marks

(a) The names of these common cutting tools (Tenon saw, Hacksaw and Surform file) that candidates must have used during their D&T lessons have either not been taught by centres or have not been revised by candidates.

(b) Generally, candidates were able to identify the risks of working on a metalworking lathe. Most answers were generic safety precautions rather being specific to the lathe.

(c) Most candidates outlined the basic process of drilling and cutting to remove the waste. However, the level of detail required to gain 4/5 marks in part (ii) was rarely evident in candidate's responses. Making plans outlined in questions such as this should outline the making activities in a reasonably logical order with some indication of the tools and equipment necessary.

(d) Most correctly identified the tapping process but again a detailed explanation of the process was rarely shown.

## Q.8 ICT, CAD/CAM, systems and processes – worth 10 marks

(a) This proved a difficult starter question for many candidates. Few even chose Tensol cement for joining acrylic to acrylic which must be a common joining method in all D&T departments.

(b) Pilot and countersink were sometimes identified with clearance rarely being known.

(c) Many candidates were able to compare the two joints and to identify the Increased surface area for gluing of the comb joint.

(d) There was a disappointing response to this question which was purposely similar to a question on the 2013 paper. Candidates were rarely able to systematically list the steps followed to manufacture on a laser cutter.

(e) A challenging question at the end of the paper which tested knowledge of a heat treatment process. It should be noted that heating and quenching will not harden mild steel. The carbon content of the mild steel has to be increased.

© WJEC CBAC Ltd.

**DESIGN & TECHNOLOGY**

**General Certificate of Secondary Education**

**Summer 2016**

# SYSTEMS AND CONTROL

## General comments

Systems and Control is a traditionally small focus area compared to some others, but candidate numbers continue to be very stable with some longstanding centres continuing to use this specification. There are a number of new centres, and some returning which is very encouraging. With the mathematical and scientific content within this specification and Examination Unit, it is understandable that some centres use this focus area as a STEM theme, and even More Able and Talented course for specific groups of learners. Although this entry is smaller in number, it is evident, historically, that candidates here are often of higher ability when compared to other focus areas.

The 2016 Systems and Control examination paper was very well received by candidates. There were many high level responses throughout question papers reflecting the high levels of knowledge, understanding and skills possessed by candidates in this subject. Virtually all candidates attempted all questions, with very few blank spaces, indicating that pupils had prepared effectively and managed the two hour time period effectively undertaking the examination paper.

There are many 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, with all marks awarded for individual questions. 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. CPD face to face events have also resumed, where attendance to these sessions are encouraged.

© WJEC CBAC Ltd.

## Q.1 Product Analysis

This question presented very few issues to the vast majority of candidates.

(a) Nearly all candidates scored highly by explaining how specification criteria had been fulfilled in the given product. A small number of candidates failed to analyse and simple described the reason for the specification point, which did not answer the question and of course scored no marks.

(b) Most identified that the product was quite expensive and due to the materials used and aesthetics of the product, it would be suitable for a collector or to be given as a gift.

(c) Most circled batch, based on the given limited number of products. A small number of candidates failed to understand scales of production.

(d) Most candidates realised that manufacturers would make an initial batch and then further production runs would be based on popularity.

(e) Generally, no issues here other than some problems evident in calculating percentages. A small minority lots some marks here by failing to show workings.

## Q.2 General Issues

Most candidates scored well on this question.

(a) Nearly all candidates could identify Reuse and Recycle for 2 marks.

(b) Responses to this varied centre to centre. Some centres had clearly covered this as part of the topic, and candidates knew the meaning and could describe what the CE mark represented. Others evidently knew very little and could only hazard a guess. Marks tended to be lost here, and candidates would either be awarded 2 or 0.

(c) Life cycle analysis was rather patchy. Very few candidates were awarded no marks, almost every candidate knew something and included sustainability, environmentally friendly materials, or the ability to be recycled in their responses. Lots gained 1 mark. To gain the full 3 marks, candidates needed to identify issues during manufacture, issues during product's useful life, and issues at disposal stage.

(d) This was generally well answered. Lots gained all 3 marks for balancing their responses and included both winners and losers. Some candidates lost a mark or two for superficial responses that lacked depth, and also for discussing winners or losers and not both.

© WJEC CBAC Ltd.

## Q.3 Designer Essay

Some problems here. Candidates understood both designers, but offering 'stock' responses from previous examination papers and mark schemes does not answer this question. Candidates either fail to read the essay question effectively, or simply write all they have learned about the chosen designer. This is not going to score high marks, and centres that highlight this issue to candidates will benefit in future.

(a) Virtually all gained 2 marks here for identifying the correct designers name from the details given.

(b) Most gained marks, but a large proportion accessed up to 4 or 5. This is because the question asks "..identifying the features that make his products innovative.." and many failed to answer this. Candidates must read the essay question carefully and avoid rehearsed dialogue, and answers from historical examination papers.

## Q.4 Design Process

This design question is always a good test of a candidate's all-round ability to design and present a systems and control concept. It is a good differentiator. High levels skills, knowledge and understanding are rewarded with high marks here. It is expected that candidates who have just completed the Controlled Assessment Task in the terminal year of their award should do well here.

(a) No issues for almost all here.

(b) Planning is weak. Understanding why planning is important is also very varied. Most gained 1 mark, but lots missed out time, and this is critical when planning.

(c) Testing is a critical part of refining a design idea. Candidates did not fully explain this and some gained 1 mark, others zero.

(d) Some candidates do not read the design question fully. Highlighting critical parts is one strategy. This year, block diagrams were very much improved. Only a handful of candidates offered a flowchart which gained no marks. Sketching ideas remains variable. A lack of colour can be disappointing in this design based question. Most circuit diagrams scored some marks, but candidates could improve with further practising of this type of question as homework tasks. Lots of marks are lost by candidates failing to add annotations to design proposals. It is simple to include dimensions, materials and label some parts of ideas to meet the design scenario.

© WJEC CBAC Ltd.

## Q.5 Commercial Manufacturing

Not many candidates scored the full 10 marks for this question.

(a) Most gained 2 marks for identifying the correct construction shown in the two pictures.
Quality control was not fully understood by all candidates. Some talked about safety, others about 'having better products', which were a little vague and lost 1 mark.

(b) There were still some very short responses relating to 'better', 'faster', 'easier' and 'cheaper'. These gained no marks unless there was an explanation as to why. Candidates should ensure that they include a comparison e.g. machines are quicker than human workers and therefore production is faster.

(c) Many candidates understood this fully and were awarded 2 marks. Some candidates mistook this as the wave soldering process and no marks were awarded.

(d) Again, this varied centre by centre. It was clearly understood by all candidates in centres that had covered this effectively, others guessed and some responses contained no correct facts.

## Q.6 Materials and Components.

This is a broad area where knowledge can sometimes be 'patchy' and 'thin'. In previous years, this question was the weakest statistically.

(a) The 'idler' gear was not well understood. Even without naming this gear, some candidates knew it was to distance the two end gears or to alter direction of rotation. The calculation was not answered very well, which was disappointing. Candidates failed to count the teeth on the gears pictured and therefore offered many incorrect responses.

(b) Most gained 2 marks for identifying the correct motion. Some candidates misread the cam question and failed to realise the first 90 degree rotation was already done.

(c) Most could not name the 'Darlington Pair' arrangement. Lots knew the diode, but some said it would illuminate, which was incorrect. High quality answers evident here stated the exact reason to reduce back emf. The 3 marks for describing the function was quite demanding. Most gained one, some 2 marks but only the higher ability gained 3 marks.

## Q.7 Tools, Equipment and Making.

Depth of knowledge is sometimes lacking here. Marks are lost too easily in this question.

(a) Virtually all gained 3 marks here for naming equipment. The vast majority of candidates gained 2 marks for safety, however some lost 1 mark for basic responses lacking explanation. Most understood that vacuum forming hazards relate to heating / potential fire risks.

(b) Naming three units that multi-meters measure did not prove difficult for most. It was evident that this was a familiar piece of equipment with which most candidates had experience. Continuity testing proved slightly more complex for some.

© WJEC CBAC Ltd.

(c) Candidates struggled to name a softwood, despite the clarity of this in the question. MDF was a popular incorrect response. Most named acrylic for the front panel. Candidates used laser cutting and etching as a method for engraving the logo. Some names CNC routing which was equally acceptable.

Part (iv) required more thinking and less recall. Candidates had obviously met this problem during their studies and many came up with very effective methods of holding pcbs and collating wires. Some candidates offered less realistic responses here including Velcro, and hot glue.

**Q.8 ICT, CAD, CAM, Systems and Processes.**

This was generally well done, but the usual pitfalls apply.

(a) Some failed to tick true for the two options here.

(b) Most candidates can comprehend the flowchart and how this is to control the scenario. Yes / No labelling in decision boxes remains the main source of lost marks. Feedback loops can be challenging for some. Most gained at least 4 marks for the flowchart. Explaining a problem required more thinking with regards how the device would operate with the flowchart. Most offered issues related to the buzzer continuing until the hopper was refilled, possibly running power down.

(c) Most gained at least 3 x 1 marks describing the stages in programming a microcontroller. There are many different ways to do this, and candidates clearly referenced their preferred method from their experiences in school settings.

(d) Most candidates realised that controlling multiple inputs and outputs was kety, also that space is limited within the product so small ICs would help. Reprogrammability and updating programs was also common.

It is evident that certain centres prepare candidates for this examination better than others. A systematic coverage of the teaching specification, together with some practical modules and making experiences appears to equip candidates with sufficiently broad knowledge and understanding to complete this paper. Completing the Controlled Assessment Task prior to this examination also reinforces and deepens the experiences that can be brought to bear in certain parts of the question paper, namely the design question (4) and tools, equipment and making in question 7. There are candidates from centres in Wales who are in the first of two years of study and undertake this examination early. Candidates from centres outside Wales are in the terminal year of the course and can be a year older than previously mentioned candidates. Overall, candidates appeared to find this paper accessible and the vast majority of scripts display very similar standards to previous years.

© WJEC CBAC Ltd.

**DESIGN & TECHNOLOGY**

**General Certificate of Secondary Education**

**Summer 2016**

**TEXTILES**

## General comments

Over the two year period of study for this course it is expected that candidates are taught the contents of the specification. Centres are advised to build sufficient time into that schedule to teach the knowledge and understanding needed for the examination alongside the skills required for the controlled assessment task. Many centres deliver a well-balanced course and thoroughly prepare their candidates for the examination; those centres are to be commended on their efforts. It is clear from the evidence seen that a large percentage of candidates are insufficiently prepared for the examination. The disparity between performance in the controlled assessment task and the written examination is a major on-going concern that is not being addressed by centres.

The performance of candidates in 2016 was similar to last year; the paper was deemed accessible and effectively tested candidates' knowledge and understanding at GCSE level. Whilst there were no obvious questions causing any specific problems for candidates there was a marked increase in the number of questions or part questions left unanswered or 'not even attempted'. The vast majority of candidates achieved around half marks in total for the paper. Of the marks awarded most were gained in section A whereas performance was considerably weaker in section B which tests specialist subject knowledge. This pattern is very similar to the last few years and continues to be ***a major concern.*** It should be noted that the latter part of each question is meant to be more challenging, targeting the more able candidate however very few actually gain full marks in these sections. There is also a sense that candidates currently taking the Textiles Technology examination are weaker in terms of ability or is it that they are simply ***far less prepared*** than in previous years? In light of the imminent changes to Design and Technology in terms of weighting for the examination it is worth noting that in order to raise or even maintain standards:

***'Candidates need to be taught the content of the specification, systematically and thoroughly throughout the duration of the two year course. Candidates also need to be familiar with examination style questions and how to answer questions in a way that will enable them to maximise on the marks available.'***

General weaknesses in candidate performance include:

- Failure to ***read the questions properly***.
- Repeating the stem of the question, then failing to demonstrate a specific body of knowledge.
- Failure to '*explain*.' An '*explanation*' requires a fact and an elaboration of that fact.
- General weakness in ***specific textile*** related knowledge.
- Lack of exam practice.
- Too many vague/superficial answers that do not gain credit.

© WJEC CBAC Ltd.

## Q.1 Product Analysis

*This question was accessible for the majority of candidates. Most performed reasonably well however there were too many superficial answers that failed to demonstrate a specific body of knowledge.*

(a) Most candidates gave the correct answer: batch production.

(b) (i) Most gave valid reasons for the detachable legs for the costume: easier for washing or easier to store when not in use. (ii) Answers varied but only a minority considered simple fastenings would allow a child to be independent.

(c) Some candidates did not understand the term 'aesthetically pleasing' however most made reasonable comments but then failed to expand on why the point was important for the full two marks.

(d) To gain full marks for this question, answers were expected to demonstrate an understanding of the tactile nature of the materials used which would enhance the appeal of the costume. Very few candidates gained full marks. This is an example where specific subject knowledge – in this case materials - is weak.

(e) A mixed response to this question. Parts (i) and (ii) most gave correct answers. Part (iii) was very disappointing, many incorrect answers with little understanding of a basic calculation. Centres are reminded that numeracy is an integral part of Design and Technology and should be fully embedded into the delivery of the course.

## Q.2 General Issues

*This question was answered well with many candidates gaining full marks.*

(a) Good responses – most candidates know the 6 R's of sustainability.

(b) Generally answered well; most candidates gained full marks.

(c) Although some candidates could not name the Lion mark (i) most gained some credit by demonstrating it was a symbol of safety and/or quality (ii). For full marks specific reference to children and toys was also needed.

© WJEC CBAC Ltd.

## Q.3 Designers

*The majority of candidates responded well to this question.*

(a) Most candidates correctly associated Matthew Williamson with the Butterfly collection and Stella McCartney with Team GB 2012.

(b) The answers to this question were variable but generally an improvement on previous years. Many candidates produced well written answers and were able to describe either Matthew Williamson's or Stella McCartney's style of work along with some reference to important elements that influence their design thinking in a ***clear, coherent and concise way***. Clearly some candidates had been well prepared for this question. However too many candidates are still just regurgitating facts with little thought to answering the *actual question.* Several candidates are still listing biographical information which is **not required** and **does not gain any credit.**

## Q.4 The Design Process

*Performance was similar to last year and seemed accessible to most candidates.*

(a) The majority of candidates do not understand the design process, the stages within it nor key words associated with it. How effectively is this taught in schools? The controlled assessment task (CAT) is an opportunity to reinforce the design process and embed key terms. Most candidates struggled to place more than two stages in the correct places.

(b) Answers to this question were very poor, mostly due to candidates *not reading the question correctly.* The majority of candidates discussed a final evaluation of a product against a specification; this was incorrect and did not gain credit. The question demanded an understanding of manufacturing processes when *developing a new idea*. This point was missed by most candidates; answers credited with full marks were rarely seen. Again this relates to the stages within the design process – an area for further development.

(c) Responses to the design question varied but were generally considered weaker than in past years. Highly imaginative and creative ideas were rarely seen. Given the quality of designs seen in CAT folders this was disappointing however the way marks were apportioned allowed candidates to score reasonable marks for their designs. (i) Some candidates did not design a one piece outfit! I cannot stress enough how vitally important it is that candidates ***read questions carefully***. (ii) The mood board was used to good effect by some candidates however most designs were not considered inspirational. Few candidates were credited with full marks. (iii) The creative use of colour was equally disappointing. To gain full marks for colour candidates need to show some creativity for example, more tones and shading of colours, or better use of complementary/contrasting colours. Using one or two flat colours would only gain a maximum of one mark! (iv) Candidates clearly know some style details but it should be noted that these have to be drawn correctly and be suitable for the product to gain credit. (v) Most candidates labelled their design with a suitable material; the most common answer was 'cotton' however the reasons for choosing it varied. If for example, cotton was chosen because it is considered 'breathable' then this point should have been expanded further to gain full marks. (vi) The quality of communication generally continues to be of a good standard.

© WJEC CBAC Ltd.

## Q.5 Commercial Manufacturing Practices

*Performance was very disappointing and clearly demonstrated a lack of specialist knowledge.*

Knowledge relating to the fashion industry was disappointing. Given the age group and interests of the candidates following this course it was surprising to see such poor responses to this question. Centres are advised to reflect on how effectively this is taught in schools.

(a) (i) Most candidates gave correct answers for the two missing fashion capitals. (ii) The majority of candidates did not know the fashion sectors represented by the pictures. (iii) Fashion terms were generally not known either.

(b) This question was yet another example were candidates either, did not read the question correctly or failed to considerer what the question was actually about. The vast majority of candidates discussed globalisation in general terms; these answers did not gain credit. Good responses that addressed the advantages of global manufacturing to the fashion and textile manufacturer were rarely seen.

## Q.6 Materials and Components

*This question continues to be an area of weakness in candidate knowledge and is an on-going concern.*

(a) (i) Most candidates correctly named the zip but struggled to name the hook and eye. Surprisingly quite a few candidates could not name a buckle!

(ii) Most knew that all the components in (i) are types of fastenings. (iii) Some candidates struggled to describe a creative way to use eyelets.

(b) Responses to special finishes varied; most had a general understanding of how the finish would improve the material functionality but failed to elaborate on their answer. Some named materials instead of a product. I reiterate the need to remind candidates to READ the questions more carefully!

(c) Considering the technological age we live in and the recent advances in wearable electronics into items of clothing this question was disappointing. Some candidates named a product that is not wearable but were given some credit were benefits to the user was appropriate. However, too many responses lacked specialist knowledge, the benefits to the user were unclear and vague. Christmas jumpers with flashing lights may be fun items but have no real benefit and did not gain credit.

© WJEC CBAC Ltd.

## Q.7 Tools, Equipment and Making

*Performance in this question was good; a slight improvement on last year.*

(a) (i) Most candidates did not recognise an embroidery scissors nor its main use in cutting intricate work however the majority of candidates gained full marks on the remainder of this part question. (ii) Only a minority of candidates gave acceptable full responses for using a French seam on sheer fabrics, most indicated it is a neater finish but failed to elaborate.

(b) (i) The majority of candidates demonstrated a good understanding of the difference between printing and dyeing however quite a number of responses lacked clarity and therefore did not gain full marks. (ii) Responses varied; some did not read the question carefully and offered a way of printing the image. Although this was accepted in part, the question asked for a different method for example: machine embroidery and/or appliqué. (iii) Piping was correctly named by most candidates.

(c) It was pleasing to see some excellent responses to this question. Candidates demonstrated good knowledge in the form of sketches and diagrams. However, some ideas were too closely related to the image shown and for several candidates the question proved too challenging and was not attempted.

## Q.8 ICT, CAD, CAM and Systems and Processes

C*andidate performance in this question was disappointing but similar to last year.*

(a) (i) There were no issues with the first part of this question. Answers to (ii) however were poor with very few candidates gaining any marks! Some candidates do not appear to know the difference between CAD and CAM. The names of equipment or machinery that incorporates CAM were required, most named the laser cutter but could not offer an additional machine.

(b) There were few issues with answers to (i) and (ii) although some responses lacked clarity when explaining the purpose of a flowchart. Some described what was included in a flowchart which was incorrect. (iii) Quality control is generally known and understood but yet again candidates' responses were not fully explained.

(c) (i) Answers varied in this question. Candidates who understood the 3 dimensional nature of a virtual prototype gained marks however too many candidates discussed use of CAD in more general terms and missed the point of the question altogether. It should be noted that *no marks are awarded for unqualified assertions for example quicker, easier or faster etc.* (ii) There were no issues with this part question.

This report needs to be read in conjunction with the examination paper and mark scheme. Centres will also find the item level data, available on the WJEC's secure website useful when assessing candidate performance. Centres will also find the **interactive resources** available on the WJEC/Eduqas website useful when preparing candidates for future examinations. 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 2017 examination.

© WJEC CBAC Ltd.

# DESIGN & TECHNOLOGY

## General Certificate of Secondary Education

## Summer 2016

## PRODUCT DESIGN

### General comments

It is apparent the examination paper was again accessible and well received by the vast majority of candidates, demonstrating that although many elements of this course are demanding and challenging, centres and candidates remain well prepared for the Unit 1 Examination. Although there seems to be fewer candidates achieving in excess of 100 marks this year. It is evident that many centres deliver a well balanced course and thoroughly prepare their candidates for the examination; those centres are to be commended on their efforts. However it is also evident that other centres are not teaching the full specification, with some questions that required specialist knowledge of Product Design being poorly answered. It is recommended that centres approach delivering the specification in a systematic and 'chapter by chapter' approach, following the content as laid out in the specification and examination paper. Centres are encouraged to use the Item Level Data to assist in analysing performance of individual candidates and the performance of the entry from the centre in order to identify effective areas and also any specification content that needs further development.

### Q.1 Product Analysis

This question was answered well by the majority of candidates.

(a) Most candidates produced appropriate specification points under the given headings, however it is clear that many candidates still do not understand the meaning of aesthetics and gave answers related to function or others areas instead. A number also failed to achieve the second mark by qualifying their answer.

(b) Most candidates were able to suggest why certain materials had been used but a number only spoke about one of the materials and as a result could only achieve a maximum of 2 marks. Candidates showed an increased understanding of ergonomics this year which was pleasing.

(c) The calculation was generally well answered other than some problems evident in calculating percentages.

© WJEC CBAC Ltd.

## Q.2 General Issues

This question presented very few issues to the vast majority of candidates.

(a) Most gained 3 marks for correctly naming the missing R words from the 6 Rs of sustainability. Explanations of how 'Reduce' can be used we detailed and showed most candidates understood. However some candidates wrote about another R word meaning no marks could be awarded.

(b) Again, increased understand was shown here with respect to a product life cycle. Some candidates wrote about the life cycle curve; however marks were awarded for these answers.

## Q.3 Designers Essay

The essay question is still proving to be quite demanding and challenging for candidates.

(a) The majority of candidates named the correct designer for each product to achieve 2 marks.

(b) It was interesting to see that the majority of candidates chose to write about James Dyson considering it is the first year that his work has been studied. Most candidates were able to write a detailed description of his work including discussion about his specific products to gain up to 6 marks. However, a number of candidates did not write about the influence he has had on the industry in order to achieve full marks.

## Q4 Design Process

This question was generally well answered with some pleasing designs produced.

(a) Nearly all candidates selected the correct stages of the design process to gain 3 marks.

(b) Most candidates gave a good response here gaining full marks by stating a suitable method of carrying out research and giving a good explanation of why user trials are conducted.

(c) There was a pleasing standard of work evident in the design question although there were fewer candidates achieving full marks for quality of communication this year showing that the overall standard of designs was lower than in previous years. Candidates were able to follow the design specification to access the marks available and some innovative designs were produced. Candidates need to remember to suggest a relevant manufacturing method for their product.

© WJEC CBAC Ltd.

## Q.5 Commercial Manufacturing

There was a pleasing response to this question with many picking up high marks.

(a) The majority of candidates were able to correctly label the scales of production gaining 3 marks.

(b) Most candidates were able to discuss an advantage to the manufacturer and explain why to achieve 2 marks. On occasion, candidates would refer to an advantage for the customer rather than the manufacturer.

(c) Most candidates were able to discuss an advantage to the customer and explain why to achieve 2 marks. On occasion, candidates would refer to an advantage for the manufacturer rather than the customer.

(d) Some improvement was noted this year in candidates understanding of QC and QA with many achieving 2 marks out of the 3 available. However, many were still missing the detail required to achieve full marks.

## Q.6 Materials and Components

There is still gap in knowledge in this section with many dropping simple marks.

(a) Few managed to gain full marks by naming the correct material and property which is concerning. Clearly more emphasis on this section is needed within schools to ensure candidates understand the names, classification and properties of a range of materials to include, plastics, wood, manufactured boards, metal, composite and smart materials.

(b) A number of candidates were able to describe what the term ‘non-renewable’ means however there were a large number who could not, instead referring to it not being able to be recycled or reused instead of discussing the fact that they come from a finite resource that cannot be renewed.

(c) Most candidates were able to pick up some marks here for identifying that cardboard is more environmentally friendly than plastic, however only the higher ability candidates achieved full marks.

© WJEC CBAC Ltd.

## Q.7 Tools, Equipment and Making

Candidates continue to find this question challenging with many lacking a depth of knowledge.

(a) The majority were able to name 3 of the tools but very few were able to name the countersink bit.

(b) Candidates showed a good understanding of the meaning of the symbols and why they are used.

(c) Most candidates were able to discuss a suitable safety precaution when spray painting but many were not able to write a detailed description of the process. Candidates generally discussed sanding the material and then spraying it, neglecting to mention other stages such as sealing the MDF and applying a primer coat, therefore most achieved 2 marks from the 4 available.

(d) Very few candidates achieved high marks on this question with many not even attempting it at all. A number achieved up to 3 marks for describing the basic process of casting metal but many details were lacking. Those candidates that did achieve full marks included a detailed description of the process accompanied by clear labelled drawings.

## Q.8 ICT, CAD, CAM, Systems and Processes.

Not as well answered as in previous years as candidates found certain questions challenging.

(a) Most candidates were able to match the correct resource with the correct abbreviated term.

(b) The majority could name a suitable software package for drawing the trophy design, however, many struggled to identify that the different coloured lines were for different operations to be carried out by the laser cutter…i.e Cut through, solid engrave, single line engrave. The majority struggled to answer (ii) where they should have been discussing the use of the contour tool to make the hole slightly smaller to allow for the thickness of the laser when cutting. Most produced a good answer for (iv) discussing how multiples of a design can be produced quickly and accurately to achieve 3 marks.

(c) Many were able to discuss the benefits of 3D printing to gain up to 2 marks but only a smaller percentage were able to relate those benefits to developing a prototype.



© WJEC CBAC Ltd.

WJEC
245 Western Avenue
Cardiff  CF5 2YX
Tel No 029 2026 5000
Fax 029 2057 5994
E-mail: exams@wjec.co.uk
website: www.wjec.co.uk

© WJEC CBAC Ltd.