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.

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DESIGN AND TECHNOLOGY

GCSE

Summer 2017

FOOD TECHNOLOGY

General comments

The examination paper this year appears to have been slightly less accessible than 2016. 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.

With the introduction of the new GCSE Food Preparation and Nutrition the advice provided below will be relevant for centres in the 2018 examination series.

All centres must continue to ensure that preparation for the examination is thorough and detailed. Centres must encourage candidates to take the time to carefully read the questions set and take notice of the marks awarded for each question as this could reduce many of the incorrect or detail lacking responses put forward by candidates. Candidates should be given opportunities to complete sample assessment papers and practise questions available through the question bank on the WJEC/EDUQAS website to enable them to become familiar with the style of questions and the type of wording used. This will also help them understand the depth of knowledge required in responses and the difference between a basic and developed response. Centres are encouraged to continue to make use of the Online Examination Review which is available via the WJEC website. This e-resource will provide 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 continue 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 areas 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) (i) Most candidates were able to identify the correct cost per person for the potato gnocchi.

(ii) Many candidates failed to identify why the cost of the potato gnocchi was not expensive, with a number of candidates incorrectly discussing portion size.

(b) Many candidates gained one mark for providing an appropriate reason for the potato gnocchi being suitable for working adults/couples; short cooking time and a two person portion size were popular answers.
(c) Many candidates struggle with this type of question even though it has been present in many previous papers. A typical response ‘a lot of the product is made each time so there will be more to sell’ does not gain any marks. Correct responses discussed the potato gnocchi not being a high demand product therefore only a small number would be made.

(d) (i) Most candidates gained one mark for providing the correct function of the egg, the wheatflour was more challenging to many candidates.

(ii) Most candidates were able to suggest a suitable flavouring to be added, candidates should be encouraged to name flavourings e.g. chilli powder to ensure marks are achieved.

(e) Some candidates correctly identified the same size and shape was important for the quality of the potato gnocchi.

(f) (i) candidates who misread the question incorrectly identified smooth texture as achieving the second highest product characteristic score.

(ii) There were some errors in the calculation. Many candidates failed to correctly add up the total scores for soft and smooth texture. This then led them to an incorrect calculation for the total as a percentage. Candidates must be encouraged to include all workings.

Q.2 General Issues

Many candidates did not access the full 10 marks for this question.

(a) The majority of candidates were able to correctly name two meals the leftover chicken could be used to make.

(b) Many candidates could provide a basic response for reducing electrical energy in the classroom. Switching ovens off is not a full answer therefore marks cannot be awarded. Candidates must be encouraged to respond to questions with full answers.

(c) (i) Many candidates could put forward a basic explanation regarding why people are choosing organic when buying fruit and vegetables. They do not contain pesticides or chemical fertilizers were popular responses. Some candidates presented a developed response and gained full marks. (ii)This question was poorly answered by many candidates. Incorrect responses discussed the packaging hiding bruises and marks on the fruit so customers were not able to see what they were buying. Correct responses referred to the packaging as being excessive and not recyclable therefore would end up in landfill sites.

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 the designer associated with the image.

(b) Many candidates were able to discuss the style and main features of Heston Blumenthal’s work. There were some very good, well written responses. Some candidates did a comparison of Heston Blumenthal and Jamie Oliver even though the question did not ask this. Some candidates wrote a complete essay on Jamie Oliver.
Q.4 Designing and Design Question

Many candidates did not access the full 7 marks available in the first section of this question.

(a) Many candidates were able to match the correct term to each meaning. Some candidates mixed up the meaning for evaluation and development.

(b) Many gained a mark for identifying a form of research used by a designer.

(c) The majority of candidates achieved one mark out of the three marks available. A suitable response was provided by many candidates and rather than extend this answer they added a second separate response. Marks are awarded for a developed response as the question asks the candidate to explain rather than state three separate reasons.

(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 suitable for cooking on a hob or required customer preparation. Suitable suggested dishes included stir fries, curries or pasta and sauce dishes. Candidates must be encouraged to include all written information requested. Many marks are lost due to candidates not relating to the 'marks will be awarded for section'.

Q.5 Commercial Manufacturing

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

(a) The majority of candidates were able to identify the correct manufacturing process.

(b) Many candidates were able to gain one of the 2 marks. Some candidates secured full marks by including an example of a mass produced food to help explain the answer.

(c) (i) Some candidates could provide a process that would be completed by the floor standing mixer when making the focaccia. Some candidates incorrectly discussed cake making.

(ii) Most candidates were able to identify a basic advantage of using the floor standing mixer, saving time and larger amounts could be made were popular responses.

(iii) Not all candidates were able to identify a quality control check but were able to discuss why checking for foreign objects was important. Many candidates lost marks as they discussed the cooking process of the bread.

Q.6 Materials and Components

This question proved to be accessible to many candidates this year.

(a) Most candidates were able to fill in the correct word to complete the sentences on the functions of ingredients used when making a white roux based sauce.

(b) (i) and (ii) Some candidates achieved full marks. Many candidates were able to correctly name vinegar but could not identify a different method used to preserve foods.
(c) (i) Many candidates identified egg as adding colour or binding dry ingredients. Some candidates were able to provide a developed response.

(ii) Many candidates thought applying the glaze to the tart meant glazing pastry before baking to give a shine and golden brown colour which was incorrect. Some candidates were able to identify the glaze was applied to improve the appearance as it gave a nice sheen to the top of the tart.

(d) Most candidates failed to explain what primary processing was. Some candidates were able to name a primary processed food with flour from wheat a common response.

(e) Many candidates correctly suggested that you would need to change the bread flour to gluten free flour. Some candidates were able to explain why this was necessary in good detail.

Q.7 Tools, Equipment and Making

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

(a) Most candidates correctly name all 3 skills. Some candidates misread the question and named the equipment pieces.

(b) (i) The majority of candidates gained one of the two marks. Some candidates did not include a full response which made awarding a mark difficult.

(ii) Some candidates were able to name other types of food poisoning; E. coli and Listeria were popular responses.

(c) (i) Some candidates lost marks by explaining how the pastry would be made when the question asked how the pastry plait is assembled. Many candidates included sketches which demonstrated knowledge of how the plait was assembled. Some candidates secured 3 of the 6 marks by identifying the main stages of assembly but left out additional stages such as using water to seal/stick the pastry into position.

(ii) The majority of candidates gained one of the two marks.

(d) (i) It was disappointing that very few candidates were able to explain that cornflour needed to be mixed with cold water to form a smooth paste. Many of the responses focused on the weighing and sieving of the cornflour.

(ii) The majority of candidates correctly identified the cornflour thickens the sauce.

(iii) Some candidates correctly identified the temperature probe would be used during the cooking of the chicken. Many candidates clearly explained why the temperature probe would be used and some candidates also included the temperature the meat should reach.
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) Very few candidates correctly stated what the letters ICT stood for. Internal computer was a common response.

(b) Most candidates correctly matched the software package to the tasks.

(c) (i) Most candidates correctly named equipment as an input.
   (ii) The majority of candidates were able to provide two correct processes; mixing and baking were common responses.
   (iii) This question was challenging for many candidates. Many candidates secured one of the two marks available with a simple response.
   (iv) This question was generally well answered and the majority of candidates were able to secure a mark.

(d) Including an image for the CAD question proved to be beneficial for many candidates. Some candidates still only provided basic responses that secured one of the two marks available. It was obvious some centres had covered this area of the specification in their exam preparation enabling candidates to provide suitable developed responses and secure full marks. Some candidates were still unaware of the benefits of using CAD for designing and suggested answers such as ‘so that all the layers are the same shape.’
General comments

The 2017 Graphics Products examination seems to have been well received. A similar amount of candidates as in previous years attempted all questions. Again the questions in section B of the paper were designed along with the mark scheme to be more accessible for all, and it has proved to be the case, although the majority of marks are still gained in Section A. The pattern of previous years remains the same, many candidates have a good working understanding of certain parts of the course, but it remains a disappointing fact that when the candidates are required to show a deeper understanding of the course, many struggled to gain half marks. Questions designed to test the depth of the candidates' knowledge are the questions that cause most issues. This proves that there is not enough time being spent on the theory element of the course, and too much emphasis is placed on the Controlled Assessment aspect. Whilst it remains true that the exam is 'only' worth 40% of the overall course, there needs to be more emphasis placed on exam preparation, particularly on the preparation to allow candidates to tackle Section B with confidence. In previous years the technical drawing aspects of Question 8 have been very poorly answered and whilst this saw a slight improvement in 2017 this could be attributed to the question requiring candidates to draw a net as opposed to demonstrating that they could complete a geometric construction. There are some issues however that refuse to go away. I feel that poor preparation allied to poor time management results in the second half of the paper being less well answered than the first. It is imperative that centres teach the specification content in depth in year 10 as well as in year 11. Candidates from the centres that do this gain more marks than the centres that employ other methods. **Could I remind centres that candidates are expected to have basic equipment i.e. ruler, coloured pencils etc.**

Q.1 Product Analysis

(a) (i) Some knew that it would be easier to print on the material if the seeds were embedded on the inside.

(ii) This was quite poorly answered with candidates not realising that the material needed to be biodegradable.

(iii) Most stated that it would be beneficial to the company's image.

(iv) Lots understood that the seeds would be damaged by any harmful chemicals.

(v) Many candidates recognised that the material strength would be compromised.

(b) Mixed responses with many failing to recognise that consumers are more ethical in their choice of products and packaging.

(c) (i) The majority got 2.1m.
(ii) Most understood the simple mathematical calculation. However there were a few who failed to round up 4.6 into 5 boxes.

Q.2 General Issues

(a) A disappointingly mixed set of responses to 'Life Cycle Analysis' question.

(b) (i) Good overall understanding of the environmental issues involved.

(ii) Many misunderstood the 'Reuse' definition. Mixing it up with 'Recycle'.

(c) (i) & (ii) The majority of answers identified the work of the standardising organisation and its symbol, but not many answered in enough detail to gain 3 marks.

Q.3 Designers

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

(b) There were a lot of essays that contained basic content relating to the work of Saul Bass, which were well written. Again candidates offered lots of biographical information relating to the birthplace of Bass and where he was educated. Like last year, this gained no marks and in effect the candidates penalised themselves by using up time and valuable writing space. Only a few candidates were able to pinpoint Bass' influence.

Q.4 The Design Process

(a) (i) Was very well answered by the majority of candidates.

(ii) Was well answered with a surprising number of candidates able to identify that the activity helped the designer find out how the analysis could improve the product being designed.

(b) This question was designed to test the candidate's ability to recognise the importance of a design spec. Lots could do this but the majority of candidates failed to do so.

(c) The question this year was an attempt to try and focus on a growing area of modern Graphic Design.

(i) Was answered well in the main although only a few gained the full three marks as they failed to combine the time and medical elements in one icon.

(ii) & (iii) Provided us with some mixed responses and as some candidates responses were lacking in the presentation expected from Graphics candidates.
Q.5 Commercial Manufacturing Practices

In general terms, question 5 was well answered with many of the responses offered gaining half marks or more.

(a) (i) was done very well.

(ii) Was answered correctly by most.

(b) Mixed responses for this question. Pleasingly lots of candidates were able to recognise at least two printing methods with a high percentage recognising all three, with many unable to recognise any.

(c) Lots were able to explain the finishing stage of the commercial printing process, with some able to name jobs that take place during that stage.

(d) This question caused many issues for candidates, with many unable to describe 'colour separation'. Most could not recognise the relationship between CMYK and printing the colours separately.

Q.6 Materials and Components

(a) Very few were able to name a composite material, one of the most disappointing questions on the paper.

(b) (i) Many were unable to recognise A4.

(ii) However more were able to recognise the weight of the paper.

(c) (i) A good number of candidates were able to show the colour systems, but we saw a lot of guesses at this question.

(ii) Some candidates were able to explain monochromatic colour scheme, although we saw a lot of responses that referred to warm and cool colours.

(iii) We saw more correct responses to the 'thermochromic' question than part (ii).

(d) (i) This was answered well on the whole with many recognising 'sans serif' font in particular.

(ii) Most candidates answered this poorly, although from the correct responses many candidates gave us a suitable use e.g. signage.

Q.7 Tools, Equipment and Making

(a) (i) Many candidates were unable to understand the term 'render' and answered incorrectly.

(ii) Some were able to recognise the ellipse, none were able to state it was an isometric ellipse.

(b) (i) Many candidates were able to recognise two or three of the pieces of equipment needed, but few got all four.
(ii) Candidates were able to provide us with good explanations of the benefits of using a template.

(iii) Most candidates gave detailed response to why it was better to manufacture the prototypes out of one piece of card.

(c) (i & ii) Most candidates were able to give photoshop as an example to answer the photo editing question, and give a reasonably detailed explanation as to why it was the best type of software to use.

(d) The number of correct responses to this question was alarming. The vast majority confused a rollover link with a type of ink.

(e) Layers and their uses were well answered by many candidates.

Q.8 ICT / CAD / CAM and Systems and Processes

(a) (i & ii) Many candidates failed to recognise the correct resolution for an image to be published on the web, but most were able to give a decent explanation as to why this was important.

(b) Many were unable to recognise an orthographic drawing and from those who could, most failed to state it was third angle orthographic.

(c) More candidates were able to sketch an accordion fold than a barrel fold.

(d) Although more candidates attempted this question compared to the traditional geometric construction/ technical drawing type question, very few candidates were able to gain full marks.
General Comments

In total, 5886 students sat the Resistant Materials paper this year, an increase of over 700 students compared to last year. Of this total, 947 students sat the Welsh medium paper. The cohort continues to be of mixed ability and is 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. It appears to have reached these objectives with the accessibility of the paper being similar to previous years.

Questions 1(a), 5(a) and 7(a) were relatively well answered throughout the cohort with questions 1(f), 5(c), 8(d) and 8(e) proving to be a challenge as well as a good indicator of higher achieving candidates.

As in previous years, candidates generally started the paper positively, their responses to questions 1 to 4 often displaying common sense and design acumen. However, following a positive start, and in an alarmingly high number of instances, candidates struggled with the remainder of the paper. It remains true to state 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.

The main areas by which candidates could improve attainment are:

- taking time to read the question thoroughly and then answering the question that has been set
- not repeating the question in their answer which obviously gains no marks and only wastes space
- reading over their answers to aid the clarity of their response. Far too many answers are rather superficial or poorly explained which would be apparent on a second reading
- revising the subject content in areas such as materials and processes. Questions 5 to 8 call for specific knowledge which can only be understood and remembered through practical experience or study. Reliance on commonsense is not sufficient for these types of questions. This will be even more relevant in future as the nature of question papers under the new specification will be even more knowledge based
- by regularly attempting past papers and practise questions to enable candidates to understand the depth of knowledge required and the difference between a basic and developed response.
Centres are again reminded that a variety of free resources are available to support learners and 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.

**General points from the examination paper:**

**Q.1 Product Analysis – worth 15 marks; the questions were based around the analysis of two clothes pegs, one traditional and another of a more modern design.**

(a) This proved to be a fairly accessible starter question. Most candidates understood the question and were able to state how the specification points had been achieved.

(b) Many identified Injection moulding as the manufacturing process used to make the polypropylene clothes peg.

(c) Many candidates were only able to give simplistic answers such as strong or hard for this question.

(d) Most identified the symbol as denoting a recyclable material with many also explaining the purpose of the plastic identification number.

(e) Virtually all candidates attempted this question and showed all their workings although the mathematical ability varied immensely.

(f) The advantages of Just In Time manufacturing were not very well outlined with many candidates basically attempting to re-write the stem of the question.

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

(a) Rethink and Recycle/Reuse were often identified as the correct Rs of sustainability.

(b) ISO – International was often correctly given, Standards less often.

(c) COSHH was generally misinterpreted as concerning product rather than substance safety.

(d) Most candidates were able to state a non-renewable energy source. The second part of the question proved a good differentiator with most candidates able to outline one benefit of renewable energy and higher ability candidates able to give further benefits or a justification.
Q.3 Designers – worth 10 marks

(a) Virtually all were able to name the correct designer from the descriptions given.

(b) All candidates showed some knowledge of both designers in their essays. Although many continue to include unnecessary biographical information in their answers. Centres are advised to warn candidates against doing this in future as it gains no marks.

Q.4 Design process – worth 25 marks

(a) The meaning of the term ‘Design Brief’ was often confused with the description of a ‘Design Specification’.

(b) 1 mark was most commonly gained here. Many candidates could give a basic reason for disassembling products but few elaborated on the reason to gain 2 marks.

(c) Similarly examples of evaluation activities were common noted but the depth of explanation needed to gain 2 marks was often missing.

(d) The design question was understood by all 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) Proved to be an accessible question. The extrusion moulding diagram was correctly labelled by very many candidates.

(b) The relatively low cost of products manufactured in countries such as China was often noted with other factors been only occasionally put forward.

(c) Full mark responses were rare. Many confused steam bending and laminating. It is also apparent that many candidates do not know the difference between the function of formers, jigs and moulds.

Q.6 Materials and components – worth 15 marks

(a) A disappointing response to this question. The piano hinge was seldom identified and the grub/set screw almost never.

(b) Candidates showed more knowledge of knock down fittings and their advantages.

(c) Despite alloy’s being a focus of a number of questions during previous examinations candidates in general did not demonstrate a good awareness of their composition and benefits.
Q.7 Tools, equipment and making – worth 20 marks

(a) An accessible starter question. The guillotine/bench shears and line bender/strip heater were well recognised, the mortiser less so.

(b) Generally, candidates were able to identify relevant safety considerations. Although most answers were generic safety precautions rather being specific to the risks associated with the pewter casting process.

(c) Despite die cutting being a common workshop process and the tapping process being questioned in the 2016 paper a detailed explanation of the process was rarely evident.

(d) The most common reason proposed for timber seasoning was “to harden it”.

(e) Questions on developments/nets have not featured on the paper in recent years but it is a common feature of product development and manufacture. Responses varied immensely from centre to centre with some candidates showing a lack of familiarity with the term net/development and drawing a 3D view of the model.

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

(a) Painted finish/Dip-coating and varnishing well commonly identified. Enamelling was very rarely answered correctly.

(b) Techsoft 2D Design software is obviously used in most centres.

(c) The causes of webbing when vacuum forming was not clear to the majority of candidates.

(d) Many answers to this question were over simplistic and few candidates gained full marks by outlining the advantages of using jigs during manufacture.

(e) This final question on the paper was concerned with the use 3D printing when developing products. Despite this many candidates discussed the generic advantages of CAM/automised production during product manufacture.
DESIGN AND TECHNOLOGY

GCSE

Summer 2017

SYSTEMS AND CONTROL

General Comments:

The number of candidates undertaking this year’s examination remains very stable, but rather small when compared to other focus areas. Historically, Systems and Control candidates are collectively of a generally higher ability than some other focus areas, with particularly strong performances from some individual centres. This was evident again this year, and this generates a slightly different outcome where there are many high achieving candidates, lots scoring marks in the 90s and 100s, and very few scoring lower than 40 marks. The question paper appears to be of a very similar demand to previous years, but at the same time very well received by candidates. All questions were very accessible to candidates with very few blanks or ‘no attempts’ to questions or part questions.

As expected, some questions proved more challenging for some candidates, often demonstrating a lack of depth in knowledge and understanding, particularly in questions 6 and 7 where the materials and components and tools, equipment and making coverage is tested. It is clear that some centres do not cover these areas sufficiently, in particular, during the first year of delivery of this 2 year course, which can often leave candidates with a limited or shallow experience of some aspects, even relying on KS3 coverage. Some scripts suggested that candidates might have been able to respond to certain questions as a result of using a components, material or piece of equipment during completion of the Controlled Assessment Task. Most candidates scored fully during the first parts of each of the questions, with some marks being accessed through the mid to latter part of questions as expected due to the increase in challenge as questions progress.

Overall, most centres appear to be delivering the specification effectively, empowering candidates to respond to specific questions during the examination.

Q1  Product Analysis. Most candidates gained close to the maximum 15 marks.

(a) Virtually all candidates were able to describe, from the information provided, how the product had met the relevant specification point. Most scored the full 2 marks for each of the points, some offered less depth in their responses and scored 1 mark. A small number of candidates re-wrote the specification point or described why the specification point was important thus scoring no marks.

(b) Identifying a target market for the given product was generally accessible for most. Again some responses lacked depth or failed to achieve the full 2 marks available for being too brief or a one word response such as office workers.

(c) (i) The vast majority of candidates offered ‘batch production’ for the one mark available.

(ii) Calculating the defects proved problematic for some. Virtually all scored one mark for offering some correct workings. Some failed to realise that 150 in 4 colours would be 6% of 600. Popular errors offered 9, which needed to be multiplied by 4 to calculate the total number of defective products.
Data analysis questions are generally accessible for Systems & Control candidates. This chart offers quarterly sales, which a very small number of candidates failed to realise this and named April as the lowest month. Reasons for sales increasing were generally gifts at times of religious holidays, or related to sales of computers, laptops and tablets increasing and contributing to accessories being required. The average monthly sales calculation was correct in most scripts, however, some candidates made simplistic errors in adding the monthly totals, or dividing by 4 quarters instead of 12 months.

Q2 General Issues of Design and Technology.

(a) Correctly naming the logos proved accessible for most. The most common error was to name Aluminium Recycling for the second logo. The vast majority of candidates scored 3 marks here; very few scored less than 2 marks.

(b) Energy labels knowledge was generally very good. Candidates understood the label and he reason for providing this information on products. Some candidates repeated the question and used legislative requirements as the reason for the label. Most candidates described purchasing decisions being supported by energy labelling allowing consumers to compare energy usage and running costs before choosing to buy a particular product.

(c) Using the 6Rs as a design tool appears to be very well understood in centres by candidates. Perhaps this forms part of year 10 studies and puts sustainability into practice for candidates. This was well answered and many candidates offered detailed and full responses deserving the full 2 marks.

(d) This part was pretty challenging for some candidates, requiring knowledge of government incentives provoked responses surrounding landfill refuse collections, 5p carrier bag charges, recycling / upcycling centres and fuel / emissions taxation for road vehicles. There were many very good responses here, beyond that expected at GCSE level, which demonstrated excellent knowledge and understanding together with very mature prose.

Q3 Designers Essay.

(a) Virtually all candidates gained the two marks available for identifying James Dyson and Shigeru Miyamoto by the images of the products provided.

(b) The essay question still presents issues. Some candidates provide solely biographical information about the designer and their work. This descriptive approach does not access the higher marks. Some candidates appear to offer ‘stock’ responses which are partly relevant, but do not fully address the demands of the question. Centres need to ensure that candidates read the question carefully and combine analysis with recall to respond and meet the question. There were, however, some excellent essays which fully identified Dyson products’ iconic features, and illustrated how these could be separated from other competitor products.
Q4 Design Process and Design Question.

(a) The use of CAD is almost an everyday activity for today's technology students, and as a result this proved to be a very accessible question. There were many varied responses including modelling and prototyping ideas, converting ideas into CNC and CAM data for rapid prototyping and 3D printing. Many discussed modelling and simulating control systems using Yenka, Logicator, PIC Logicator, and similar programs. Most candidates gained the 2 marks here. Some 'thinner' or less developed responses gained 1 mark, but almost none failed to score.

(b) This question saw many scoring one mark for identifying a typical heading e.g. 'cost' or 'function' but not developing the response to include measurable data, or specific details that would set parameters for the designer. Lots of candidates gained 2 marks here for detailed descriptions of content that would be included in a design specification.

(c) This question proved more difficult for candidates to access all 3 marks. Many gained one or two marks here. The best responses included information regarding the content of the design specification being used as a designing ‘tool’ or ‘checklist’, allowing the designer to cross reference whether ideas met the success criteria, and where ideas needed to be developed or refined to include all specification content. Other responses made reference to ‘keeping the designer on track’ and preventing designers going ‘off on a tangent’ away from the main criteria.

(d) The design question was well received in the main. Lots of papers contained very good evidence that candidates had been well prepared for this question, supported by completing the CAT.

(i) A variety of electronic systems were presented, most conventionally correct using component symbols and well-constructed. Some candidates missed the detail regarding the two separate function required which were to automatically illuminate a warning sign in dark conditions and also flash 3 red LEDs regardless of light or dark conditions. Some candidates offered programmable / PIC systems which catered for the variety of inputs and outputs. Others used transistor switching systems with the warning symbols as a passive / stand by feature.

(ii) Block diagrams are confused with flowcharts. Candidates sometimes appear to be unable to differentiate. As a result, candidates generally scored 2 or 3 marks here, or zero for offering a flowchart.

(iii) Designing is usually quite strong, and this year it was quite pleasing to see good quality sketching, and more attention to labelling and annotation to include specification details/content. Shading and rendering is always a positive feature, and candidates are reminded that this is a design examination, so the opportunity to design and present ideas should be maximized.

(iv) Folding the concept flat proved difficult for some to incorporate into ideas. Most used hinge type mechanisms, some offered rigid rods that could be connected to erect devices and removed to separate them. More detailed responses / evidence gained the 2 marks, simple labelling or basic ideas gained 1 mark.
Sizes, materials and quality of communication has improved recently, possible due to the completion of CAT pages, and instructions to label, analyse advantages and disadvantages and include decision making. There seemed to be more labelling and annotation this year in the scripts viewed which was very encouraging.

Q5 Commercial Manufacturing Processes.

(a) Virtually all candidates connected the correct terms to the descriptions for continuous flow production and mass production. It appears that scales of production are well understood based on responses here and in question 1 with batch production.

(b) The vast majority understood the CE mark as a symbol of European Conformity meaning that a product has been tested and approved and is fit for purpose in this region. There were some excellent responses here gaining the full 2 marks. Some weaker responses gained just 1 mark, but very few were left blank or incorrect.

(c) (i) Some candidates confused wave soldering with reflow, and used solder paste in the first space. Most identified heating or pre-heating for 1 mark and cooling for the other mark.

(ii) Fluxing is used to clean the solder pads and components preventing oxidization. This was answered very well, with evidence that some centres had covered this in some depth and detail.

(d) The latter part of each question does provide increased challenge. This proved difficult for some candidates, and some failed to access the full 2 marks because responses were very basic or used words like ‘faster’, ‘cheaper’, ‘more efficient’ without comparing automation to manual workers. There were again some excellent high quality responses fully covering all the reasons why manufacturers automate production.

Q6 Materials and Components.

(a) The vast majority of candidates fully understood the resistor colour code and established the correct values for each of the resistors. Some mistakes occurred when stating the 68ohm resistor where some added a zero to make 680ohm.

(b) Again, the vast majority understood the tolerance of 10% and added this to the original value to total 1100ohms.

(c) (i) Too many candidates failed to look carefully at the switch symbols in the circuit diagram and named PTB or push to break. This was an easy mark to gain.

(ii) Lots of candidates identified the AND gate and could describe that both inputs would have to be ‘on’ or ‘high’ for the output to be activated. If one switch was ‘broken’ or pressed the gate would switch the lamp off.
(iii) The 3 marks available here required detailed knowledge to explain the reason for the transistor. A small number of candidates produced excellent responses describing the current amplification needed to illuminate the lamp fully, without the transistor the current would be insufficient and may not illuminate the lamp, or it may be very dim. Lots of candidates gained 2 marks by describing the transistor and explaining how it worked which only partially answered this question.

(d) The linkage problem was fairly demanding in order to achieve the full 3 marks. Many candidates were awarded 2 marks for a correctly constructed linkage that would achieve the desired output without the correct velocity ratio. The critical distance between the fixed and loose pivots determines the VR (depending on the linkage design) and the small minority of candidates achieving this produced outcomes out a high technical standard.

(e) This moments calculation provided a test that candidates could understand the two children on the right side of the seesaw, with the furthest 1.6m away and not 0.8m. This was a common error which resulted in the wrong answer but often the correct procedure, gaining 1 of the 2 available marks. Higher achieving candidates executed methodical and organized calculations without issue.

Q7 Tools, equipment and making.

(a) (i) Most candidates identified at least two of the items, gaining 2 marks. The majority describe all three correctly.

(ii) The IC holder or DIL Socket proved challenging for some. Although some candidates failed to access the mark for naming this, they were still able to gain marks for the description. Weaker descriptions with some truth were awarded 1 mark.

(b) The two workshop symbols proved very accessible, with nearly all knowing the meaning of both.

(c) (i) The most popular response here was vacuum forming, gaining 1 mark.

(ii) Acrylic was the material named by the majority here.

(iii) Candidates seemed to experience difficulties setting out to respond to this question. With 3 marks available, responses needed to include a method of accurately marking out the windows, a method of cutting of wasting, and then finally sanding or filing to finish the opening effectively. Laser cutting would not be appropriate due to the angle of the face on the product. Many candidates failed to access the full 3 marks, lots achieved 2 and some only 1 mark.

(iv) Fitting the potentiometer proved difficult for some. Many candidates gained some marks, but only the very well organized gained all 4 marks available. Responses needed to include the distinct steps for this process such as marking out, drilling correct size hole, removing nut, fitting potentiometer from inside casing, then securing the nut and push fit for the cap. Clearly some candidates had never seen these components and therefore struggled to access these marks.
Designing and producing vinyl graphics appeared to be poorly understood by
some. Descriptions of the three main stages of designing using CAD, loading
vinyl into machine and cutting, then removing vinyl, weeding and applying the
graphic using low tack transfer tape would suffice for the full 3 marks. Most
candidates scored some marks, but lots of responses included laminating or
using adhesive.

Q8 ICT, CAD, CAM, Systems and Processes.

(a) (i) Nearly all candidates identified the display panel as an input was false, and
the buzzer as an output was true. The two marks here proved very
accessible.

(ii) Almost all candidates gained at least 1 mark here, but some failed to access
the full 2 marks. The barcode reader scans the card – 1 mark, and then
decides whether the card is valid to lock or release the arm – the second
mark. Some responses were too brief and did not offer the depth to include
the second factor.

(b) (i) The flowchart represents a challenging series of events with a large mark
allocation. Most candidates scored well here, but sometimes one error can
result in at least two marks becoming inaccessible. Some candidates failed to
label the Yes/No on decision boxes which rendered the response incorrect.
Some struggled with the feedback loop and failed to access this mark. There
were plenty of candidates scoring the full 8 marks here.

(ii) The last question was very demanding and only the detailed and accurate
responses gained the 3 marks. Most candidates identified the need for an
additional decision to establish whether 50 people had entered the sport
centre, gaining a mark. Further developed responses included the idea of
having a variable e.g. \( x=0 \) representing no member present, \( x+1 \) when one
person enters, \( x-1 \) when one person leaves, then a check is \( x=50 \) with a yes
and no feedback loop. Many candidates supported written responses with
diagrams of flowcharts and sub routines which were very sophisticated
gaining the full 3 marks.

Overall, the standard of responses within examination scripts was very high, reflecting very
good knowledge and understanding of principles within the teaching specification.
Candidates were of a generally high ability, and a large number of scripts scoring high
marks. Weaknesses tended to be evident in Q6 and Q7 where candidates had to
demonstrate real depth of skills in specific areas and respond in a practical sense, based on
workshop based practice. Centres and candidates should be congratulated on the general
standard of scripts generated this series.
General comments

The performance of candidates in the 2017 paper broadly reflects that of previous years. The structure of the paper allows for a wide range of topics to be examined and was considered an effective test of candidates' ability, knowledge and understanding at GCSE level. The paper was well received and deemed accessible with no obvious questions causing concern. However, there was a slight increase in the number of whole questions and many part questions not attempted.

Many candidates seemed ill-prepared for the examination with a distinct lack of subject specific knowledge; many appear unable to answer questions in a way that would enable them to maximise on the marks available. Centres are advised to build in sufficient time over the two year period of study to teach the knowledge and understanding needed for the examination alongside the skills required for the controlled assessment task. However, there were many examples of excellent papers where candidates demonstrated sound subject knowledge and had been well-prepared for the examination.

The majority of candidates achieved between 50 and 70 marks for the paper. Candidates generally perform better in section A which tests general issues whereas performance was considerably weaker in section B which tests specialist knowledge. This is a common pattern in this paper and is a major concern. The latter part of each question is meant to be challenging, however very few actually gain full marks in these sections including the better performing candidates. The cohort remains predominantly female.

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.
- Failure to *describe*, with one word responses being offered that do not answer the question.
- General weakness in **specific textile** related knowledge.
- Too many vague/superficial answers that do not gain credit.
- Poor literacy skills – responses often lack clarity.
- Lack of exam practice.
Q.1 Product Analysis (Rucksack style bag).

This question was accessible for the majority of candidates and most performed well.

(a) (i) Most candidates gave the correct meaning for the symbols shown.

(ii) Several candidates did not understand the term ‘spot cleaning’ and either incorrectly linked it to the symbols in the previous question or the spots on the rucksack bag!

(b) (i) Candidates understood the features that ensure the safety of possessions being stored in the rucksack bag and most gained full marks.

(ii) The ergonomic features that provide comfort whilst the bag is in use was answered well with most candidates gaining full marks.

(c) (i) Most candidates identified style as the most important factor when buying the rucksack.

(ii) The response to what was considered a basic calculation was mixed with many incorrect answers. 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/Sustainability

This question was quite disappointing with too many superficial answers, lacking in detail.

(a) Quite a few candidates were not able to state the most suitable R word for each statement. This topic has always been considered a strength in the paper, so the responses were quite disappointing.

(b) (i) Generally answered quite well; most candidates knew the source of fibres for the products but then omitted the reason why nylon takes longer than wool to decompose.

(ii) This question was about the transportation of materials prior to manufacture and final products' route to their sale destination – carbon footprint in other words. Few candidates realised this and focussed wholly on mass production in China. Either candidates did not read the question correctly or failed to considerer what the question was actually about. The responses were disappointing; few gained full marks.

Q.3 Designers

The majority of candidates responded well to this question.

(a) Most candidates correctly identified the two statements that reflect Matthew Williamson’s work.
(b) The answers to this question varied. Many candidates produced well written answers and described Stella McCartney’s style of work along with the values that influence her design thinking in a clear, coherent and concise way. Clearly some candidates had been well prepared for this question. However too many candidates regurgitate facts not relevant to the actual question. Biographical information or lists of collections she is associated with were not required and did not gain credit. Centres are reminded that both designers need to be studied for this examination.

Q.4 The Design Process

Performance was similar to last year; the question was accessible to most candidates.

(a) The majority of candidates do not understand the design process nor key words associated with it. The controlled assessment task (CAT) is an opportunity to reinforce the design process and embed key terms.

(i) Several candidates were unable to suggest different methods of communicating design ideas.

(ii) Candidates understood how to gather customers’ opinions but fully developed answers were rare.

(iii) The link between a design specification and a final evaluation was understood by most candidates' however some answers were superficial.

(b) Responses to the design question varied but were considered an improvement on the 2016 design task; most candidates gained at least half marks. Candidates were careful in ensuring their designs addressed the assessment criteria. Whilst some highly imaginative, glamorous and creative ideas were seen, most designs were not comparable to work seen in the CAT folders; this was disappointing.

(i) All candidates designed an outfit however some were clearly not glamorous nor suitable for the named occasion.

(ii) The mood board was used to good effect by most candidates however some designs were not considered inspirational. Few candidates were credited with full marks.

(iii) The creative use of any 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 gains a maximum of one mark!

(iv) This design task offered the candidates a real opportunity to demonstrate sound knowledge by selecting from a vast range of materials for a glamorous outfit such as named satin types, various silks including chiffon, organza, laces etc. Whilst some candidates selected suitable materials for their design others chose cotton or linen; the latter did not gain credit in most cases as they were not considered glamorous or suitable for the dress designs presented. Most candidates only appear to know the names of basic textiles materials.

(v) 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.

(vi) The quality of communication continues to be of a good standard.
Q.5 Commercial Manufacturing Practices

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

Knowledge relating to the fashion/manufacturing industry and in particular product cycle graphs was disappointing.

(a) (i) Most candidates gave correct answers for the industrial equipment.

(ii) The majority of candidates did not give sufficiently detailed answers for the advantages of computer controlled machinery. Unqualified assertions such as ‘quicker’ and ‘saves time’ do not gain credit. Candidates must explain how.

(b) (i) Only a minority of candidates gave a full definition of the term ‘obsolescence’.

(ii) Most candidates gained credit for responses related to the use of sales graphs but again answers were superficial (possibly guess work from reading the graph) lacking the depth of understanding needed for full marks.

Q.6 Materials and Components

*This question continues to be an area of weakness in candidate knowledge, but a slight improvement on last year.*

(a) (i) Most candidates correctly identified which statements were true or false.

(ii) Surprisingly few candidates identified the silk cocoons but gave the correct properties for silk and wool.

(b) (i)(ii) The question about parachute clips was well received and most gain full marks for the associated use in textiles.

(c) (i) Most candidates gained some credit for naming a textile product that would be made from a coated fabric and included an appropriate reason. It should be noted however that a coated fabric is different from a fabric that has been water proofed.

(ii) The next part question about the hydrophilic membrane used in performance clothing was set as a challenge, few candidates gained full marks. Most responses merely described the diagram with no real understanding of how the system works to the advantage of the wearer. This question demonstrated the weaknesses in candidates’ specialist textile knowledge. Some candidates did not read the question properly and therefore did not refer to the comfort of the wearer.
Q.7 Tools, Equipment and Making

Candidate response overall was disappointing, level of knowledge very poor.

Given Design and Technology is about designing and making products, performance in this question was particularly poor. Centres are advised to reflect on how effectively candidates are tested to reinforce knowledge and understanding relating to the construction processes and techniques used on the products they presumably make during the two year period of study.

(a) Knowledge of material construction and pattern language was quite weak. Few candidates scored well in this section.

(i) Most candidates correctly labelled the warp and weft yarns but struggled with the selvedge edge.

(ii)(iii) A few candidates correctly identified where the ‘bias’ would be on a piece of woven materials but then failed to explain why some pattern pieces are cut on the bias when making clothing.

(iv) Pattern markings are generally not known.

(v) Answers relating to following pattern language were also weak or not known.

(b) The majority of candidates demonstrated good understanding of the marbling process and gained marks, however many more did not recognise silk painting with gutta (outliner); some thought it was batik!

(c) It was pleasing to see some excellent responses to this question. Candidates suggested including quilting, embroidery and appliqué with textured materials as well as beading, sequins, French knots to name a few techniques. Candidates demonstrated good knowledge in the form of sketches and diagrams; ideas presented would clearly enhance the design to make it more 3 dimensional. Some candidates however misunderstood the question entirely and discussed using shading around the flowers to give a 3D effect. It is essential that candidates think more carefully about the question before answering.

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

Candidate performance in this question was very poor.

(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! Possible answers include: to show colourways; to design printed patterns; to develop patterns to be cut/engraved on the laser cutter. Acceptable answers were rarely seen!

(b) (i) Answers to this question were equally poor with few candidates able to suggest a suitable software package to record the result of a survey.

(ii) Equally disappointing; answers were generally vague and lacked any form of subject knowledge. Good answers with full descriptions including reference to charts or graphs were rarely seen.
(c)  
(i) Answers varied in this question but full marks were rarely awarded. Some candidates understood the sequence but forgot to include the correctly drawn flowchart symbol however credit was given to correctly placed stages without a symbol. Some candidates struggled with the correct sequence even though the stages were given. This was set to challenge candidates but proved too much for many candidates who did not even attempt the question.

(ii) Most candidates forgot the feedback loop.

The disparity between performance in the controlled assessment task and the written examination continues to be a major concern that is not being addressed by many centres. In light of the imminent changes to Design and Technology in terms of weighting for the examination and NEA (50:50) 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.’

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 2018 examination.
DESIGN AND TECHNOLOGY

GCSE

Summer 2017

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. 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 gave appropriate responses to access the marks on offer however some candidates proceeded to write specification points rather than say how the given specification points were achieved.

(b) Candidates continue to show an increased understanding of ergonomics by being able to identify the ergonomic features of the keyboard and state how they have improved it, however only the higher ability candidates were able to give extended answers to achieve full marks.

(c) The calculation was answered very well with the majority of candidates able to calculate the average hand breadth to achieve full marks.

Q.2 General Issues

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

(a) Most gained 4 marks for correctly naming the missing R words from the 6 Rs of sustainability.

(b) Most candidates were able to describe some benefits of recycling materials and a large number were able to give a detailed answer with three benefits to achieve 3 marks.
(c) In general candidates understood that sustainable design was about environmental issues but only those who went on to discuss how applying LCA principles accessed all three marks.

Q.3 Designers Essay

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

(a) Nearly all candidates were able to name the designers to achieve 2 marks.

(b) Most candidates were able to write a detailed description of James Dyson’s work including discussion about his specific products to gain up to 6 marks. However, a number of candidates did not clearly identify the innovative features of his products to achieve full marks. Candidates were however writing about the influence Dyson has had on others which was not part of the question this year. Candidates should be encouraged to read the question carefully and answer what is asked.

Q.4 Designing and Design Question

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

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

(b) Surprisingly the majority of candidates struggled to explain what a design brief is and instead most described a specification. However, good understanding of the importance of making a prototype was shown with most candidates achieving 2 marks for the second part of the question.

(c) There were many candidates totalling around 15 - 16 marks for this question. A well-rehearsed approach helps. Very few blank spaces, lots of good quality shading and accurate conventions.

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 underline injection moulding for 1 mark.

(b) Most candidates were able to describe the scales of production with many giving examples of each.

(c) Candidates are still showing a lack of understanding about QA with most writing about QC instead.

(d) It was pleasing to see many detailed answers referring to the advantages of mass producing products. Many achieved high marks on this question.
Q.6 Materials and Components

There is still a gap in knowledge in this section with many struggling to access higher marks. 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.

(a) Few managed to gain full marks by naming the plastics under the correct classifications.
(b) It was clear that only a few candidates knew anything about GRP to be able to name a product that is made using it or describe its structure. Many left this question blank.
(c) Most candidates were able to pick up some marks here by identifying specific properties that materials might have, however most struggled to write a clear definition of what material properties are.
(d) Most candidates were able to pick up some marks for naming the correct property of the materials shown and stating why it was used for the product. However, a number of candidates named classifications of materials rather than material properties.
(e) Only a few candidates discussed the fact that over the years batteries have become smaller meaning products have also been able to be smaller, slimmer and lighter. However, many discussed that batteries have enabled products to become portable to pick up some marks.

Q.7 Tools, Equipment and Making

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

(a) Candidates generally struggled to give the correct name and use for the equipment shown. In particular, very few were able to name the soldering iron or Tenon saw and therefore most did not achieve more than 3 marks out of 6.
(b) Pleasing response with most candidates able to correctly label the pedestal drill.
(c) Most candidates were able to discuss 2 suitable safety precautions when using the pedestal drill to achieve 2 marks.
(d) Many candidates achieved 1 mark for discussing general safety hazards when drilling but only those who referred to the properties of acrylic, being brittle and therefore having a risk of shattering achieved full marks.
(e) Most candidates made a good effort to answer this question showing a good understanding of the process with suitable sketches to achieve up to 4 marks. Those who understood that an acrylic net needed to be created first and provided and in depth description of the process achieved full marks.
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 name what CAD stands for to achieve 1 mark.

(b) The majority of candidates were able to name the laser cutter and 3D printer as the correct CAM machines for the products shown, however, very few were able the CAMM 1/Plotter/vinyl cutter as the machine used for vehicle signage writing.

(c) A good understanding of input, process and output was shown in general with most able to match the statements to the correct word.

(d) The majority of candidates struggled to name the drawing method as ‘Isometric projection’.

(e) There were many, very pleasing one point perspective drawings completed with effective shading to achieve full marks on this question. However, there were also a large number of candidates who had no idea what 1PP drawing was and were unable to answer the question.