OCR
RECOGNISING ACHIEVEMENT

GCSE

Design & Technology (Product Design)

General Certificate of Secondary Education **GCSE J901**

General Certificate of Secondary Education (Short Course) **GCSE J900**

Report on the Units

June 2010

J900/J901/R/10

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This report on the Examination provides information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the specification content, of the operation of the scheme of assessment and of the application of assessment criteria.

Reports should be read in conjunction with the published question papers and mark schemes for the Examination.

OCR will not enter into any discussion or correspondence in connection with this report.

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REPORT ON THE UNITS

Chief Examiner's Report

General Comments – Legacy to new specification

This report is written with the fact that this is the final session of this legacy specification (J900 J901) which has run alongside the new specification (J305 J045) this year.

This examination session saw the use of Moderation Manager accessed through the OCR interchange. This has proved to be very successful in many respects with the reduced administration and speedier contact between centres and moderators.
However, there are a number of centres who had not registered an appropriate up-to-date email address with OCR which resulted in a number of significant delays for those centres. Centres are therefore respectfully requested to ensure that the email address for the recipient within the centre (ie The Examinations Officer) is both accurate and kept up to date by informing moderationmanager@ocr.org.uk directly.

Centres are reminded that for B801 Candidates are not required to make their design outcomes. However, with appropriate teacher guidance and support, the design outcomes may well be realised in Unit 3 Making, Testing and Marketing but do not have to be. There are distinct benefits for candidates undertaking totally different projects for B801 and B803 and the practise of "design" and "make" is actively discouraged in this specification.

In the legacy specification there are a very small number of cases where candidates actually do make what they design. The two parts of the folio for B801 and B803 should be separated to allow individual despatch to the appointed moderators for each unit.

Once again, a good number of centres forwarded all the necessary paperwork to the moderators on or before the 15th May which assisted moderation greatly.
There were also a smaller number of centres who forwarded their coursework directly to the moderator without waiting to be asked for a sample. Where there are low numbers of candidates in a centre, this positive action is welcomed by the moderation team.

For postal moderation using the electronic format a good number of centres have adopted the practise of submitting the full sample of a cohorts folios on one CD-ROM which is both effective for centres and for moderators. If centres wish to adopt this practice, rather than the original instruction of one CD-ROM per candidate, they may continue to do so. This will additionally reduce costs for centres with the number of CD-ROM's needed and also postage costs. Several centres submitted work on a flash drive which is also acceptable practise. Centres should note however that only paper folios will be returned to centres.

Centres should be aware of the textbook written in support of this specification and the new specification is now available from Hodder Education ISBN 978 0340 98200 6. Additionally there is a DVD teacher resource ISBN 978-0-340-99123-7 available from Hodder Education.
Discounts are available for class sets of the text book. Both resources have proved to be very popular indeed with both students and teachers alike.

B801 Coursework – Developing and Applying Design Skills

B801 Developing and Applying Design Skills

The majority of candidates presented evidence for all three assessment objectives (IAO1, IAO2 and IAO3).

- Much of the work presented had communication of a low order but where centres taught those skills work ranged from good to excellent.
  Some of the written work was almost illegible. The use of PowerPoint can assist candidates with spell checking.
- The selection of non teacher lead and appropriate **start points** ie "The problem identified". Situations/problems to be addressed which were too challenging for an average 16 year old to address in the allotted time, thus restricting access to the assessment criteria. A number of centres "over prescribed" the start point which severely restricted candidates accessing the assessment criteria
- **Identification** of a suitable user or user group. A number of candidates had no clear focus with their design activity because they either had not clearly identified who they were designing for or, in a few instances, when they were designing for themselves. This is a common problem and restricts the design process as does designing with the making of the solution in mind.
- **Evidence** of both the problem and the user in IAO1. This could be in the form of photos, newspaper articles, actual data obtained from the internet or elsewhere (not fabricated) or genuine interviews or questionnaires. This was very weak in a number of cases. There was, from a small number of centres, some excellent evidencing by candidates using video and other means.
- **Consideration** and reflection using the Design Specification. Often the Candidates brief and their subsequent design specification are ignored after they have been written which limits access to the assessment criteria especially in strand 3 of IAO3 for which there are 8 marks available.
- An appropriate **range** of clearly focused and relevant **research** activities. Internet downloads with no valid analysis or evaluation and mood boards without meaningful comments will gain no marks against the assessment criteria. Research is undertaken to gather data and information to inform the design process and this is lacking in a large number of cases.
- Development of **analytical** skills and the willingness to use their findings in the design activity. Often when research has been undertaken the information gained was ignored. The whole folio should demonstrate a "flow" from problem to solution in a meaningful way.
- Preparation of **questionnaires** (for IAO1 and for IAO2) which will illicit relevant data which can then be used to enhance the design activity. To produce a good questionnaire to elicit useable data is a high order skill which centres will need to teach candidates. Unless the questions and data are meaningful they will have no value and cannot be rewarded highly.
- **Modelling** skills – demonstrating manipulative modelling skills. Modelling is a basic communication and design skill which needs to be taught at KS3 and reinforced at KS4. Marks for the modelling are rewarded in strand 2 of IAO3 which reflects the candidate's consideration of function, aesthetics, ergonomics and/or other design influences.
  The modelling in this unit is <u>not</u> meant to be making a model of their final idea but used to test the feasibility of design ideas.
- Appropriate use of **CAD** or Other Computer Applications to support and enhance the designing activity. The higher marks in strand 5 of IAO3 cannot be awarded unless the ICT (ideally CAD) is used **during** the design activity. To produce images of what has already

been designed is not actually using Computer **Aided** Design software appropriately and marks will be capped in such instances as it is regarded as Computer Aided **Drawing**

- Production of a **range** of detailed **ideas** with reflection of the user and other design influences. Often ideas are predictable and so preclude access to the higher marks in strand 1 of IAO3. If, in IAO1, a candidate is going to design a jewellery box (often they say "***make*** a jewellery box which is not a requirement of this unit) then designing will be restricted throughout the whole process
- Detailed and meaningful comparison of ideas and **development** against their specification. A simple tick box or marks out of ten does not show any meaningful relationship between the specification and the ideas

Comments on Individual Assessment Objectives

Internal Assessment Objectives 1 (Maximum Marks 6 Approximately 1 hours work)

Candidates will need to:

- provide a detailed description of the design need using various means of communication.
    - **For one mark what is required:** A short description (two or three sentences would be more than sufficient) of the problem to "set the scene"

- extract from verbal, visual and statistical information the essential problems to be solved
    - **For [1] mark what is required:** Evidence of some sort to justify/support the problem outlined. As stated above, this could be in the form of photos, newspaper articles, actual data obtained from the internet or elsewhere (not fabricated – this send both the wrong signals to candidates and limits access to the assessment criteria) or genuine interviews or questionnaires. It is not sufficient for the candidate merely to "state" that there is a problem they need to "prove" in some way.

- identify the range of users and the market for which the product is intended
    - **For [1] mark what is required 1:** Identification of a single user or a user group. A specific person eg "The senior citizen who lives across the road", "estate agents" or "left handed tennis players" are examples of users or user groups. Poor examples might be when designing "it will be for senior citizens of both sexes".
    - **For [1] mark what is required 2:** Some actual evidence of the user – some specific information/details upon which the candidates can focus their design activity. An interview, an image and information or genuine quotes from the user, objects which mean something to the user, evidence of particular like or dislikes of the user to keep the situation "real".

- develop a design brief for a marketable product which is innovative and might involve some degree of risk taking.
    - **For [1] mark what is required:** One or two sentences would be more than sufficient where the candidates individually "explain" what they are going to try to achieve to solve the problem which they have identified.

    - **For the award of [1] mark:** If all the elements noted above are in place and the "package" for IAO is complete enough for a 3rd party to pick up the problem/situation and they stand a reasonable chance of undertaking the design activity in an appropriate direction then the 6th mark is awarded.

As previously stated in reports to centres, the start point for all candidates is critical to empower them to proceed effectively as true Product Designers. Even Candidates who are unable to demonstrate Flair and Creativity will still gain positive rewards providing they present evidence which meets the assessment criteria.

Examples of designing a space station, an aeroplane or submarine demonstrate the fact that an achievable focus was absent and resulted in design work of unacceptable depth or breadth.

Centres are advised to ensure that the "Situation and User" chosen by the candidates will allow access to all the assessment criteria and also allow the design activity to proceed smoothly. Centres may wish to "theme" their candidates and this is acceptable as long as there is sufficient scope and flexibility for all levels of ability to access the assessment criteria. Personal interest and involvement are also seen as powerful stimulants.

One serious problem noted in IAO1's where candidate actually specifically state what they are going to design, or, in extreme cases what they have made. This just will not allow candidates the freedom to access the assessment criteria.
Centre should remember that candidates do not have to make what the design in B801 . If candidates do design with making in mind, it will severely limit their design activity and subsequent access to the assessment criteria. This is worrying approach when candidates clearly state that this is the case and reflects on an inappropriate centre approach.

Many candidates in IAO1 gained 3 and 4 marks with few candidates gaining full marks where evidence of their problem and user was not presented. Improvements in IAO1 resulted in most candidates gaining 5 or 6 marks which then empowered the design process enabling further marks to be gained.
The work represents about an hour's work and should be presented on one or perhaps two pages (slides).
Centres are reminded that teaching activities such as planning how to approach the project, mind maps and time planners are **not rewardable** against the assessment criteria but are often good teaching support for candidates.

An example of a very good "situation", "user" and excellent "evidence" for the situation is shown below

N.B. In electronic submissions **Internet** hyperlinks **must not** be used. However hyperlinks are quite effective if used within a presentation.

In the case of the example shown below the use of a short video to 'evidence' the situation and the user gets straight to the point, relays accurate information and is a 'fun' aspect of the coursework.
Centres should also note that the marks for the use of ICT or Other Computer Applications (OCA) are only awarded for work in IAO3. Nevertheless they can fully contribute to the quality and content of IAO1 and IAO2 and are to be encouraged.

This is an excellent example of IAO1.

Skateboarding: This is a £3.5 billion a year industry with thousands of participants just in London, although unfortunately there are only 8 skate parks between all the London boroughs.
The average distance between a London skater and his/her nearest skate park is 37.5miles. This is too far for the average youngster to travel on a regular basis.

Video Outlining the problems with existing solutions.

Design Brief: I aim to design a portable skateboard training facility that can help different ability skateboarders with different styles improve their transition techniques and skills.

In a recent internet survey 98% of South Bank skateboarders said they were frustrated because they have nowhere exciting to skate that they can call their own.

I took a sample of 3 bay66 skateboarders and asked them what their main problem is with skating transition:
1st Ralph. Said he can't skate bay's ramps as they are too big. *2nd* Ken. Said they are too steep for his style of skating. *3rd* Jake. Said he can only travel there on Sunday as the skate park prices are too expensive (£3 for 2 hours or £6 for half a day).

Identification of problem

Here are 2 options to solve this problem that I already own. However they are heavy, and awkward to carry (far from portable), also neither caters for more than one style of skateboarding.

Quote: on the need for an improvement.

"Nah as a kid I never skated ramps. I couldn't, the nearest skate park was an hours drive and those mini kicker ramps some of my friends had, all sucked. They don't let you get creative because they're always the same shape and they are so difficult to move you can't skate where you want with em" (Jerome Rogers a pro skater on why he never got the chance to learn how to skate ramps.)

Target User group:

My user group will be London based skateboarders ages 14-18.In particular the skaters of baysixty6 skate park.

Picture 1:

baysixty6 skate park where a large percentage of my target market tend to gather.

Picture 2: This picture shows London's South Bank a popular skate spot.

I asked a regular of baysixty6 Jed Leach why he comes to the skate park?
-I live around 150 miles away but I come here at least once a holiday because where I live there isn't anything interesting to skate.

Internal Assessment Objective 2 (Maximum Marks 23)

Strand 1: Candidates will need to:

This is all about obtaining valuable data about the user and other (than Product Analysis) research to inform the design activity

- **For 0 to 7 marks what is required:** Some investigation into the user/user group requirements or the possibility of factors to avoid for example the use of milk in a product or the use of fur fabric for whatever possible cultural or religious reasons. Information such as "genuine" anthropometric data and ergonomic requirements or details of specific components such as battery holders where the use of a battery is obviously necessary for the problem being solved are required to gain marks in strand 2 of AO2.

Sheets on "materials" are unlikely to gain marks unless there is a specific situation being addressed such as protective clothing for cyclist when information on Kevlar or Nomex would be relevant. The inclusion of such information at this stage is a hang over from the legacy linear material specific specifications and is **not** appropriate for product design. It is however very appropriate at the design stage where a component or ingredient is needed and the designer needs to develop or finalise details. An important point for centres to note is that marks can still be awarded in strand 2 of IOA2 even though the work is evidence in IAO3.

Strand 2: Candidates will need to:

This is all about Product Analysis of existing "similar" products and obtaining valuable data to inform the design activity

- **For 0 to 8 marks what is required:** Analysis and evaluation of existing, appropriate or inspirational products. If some method of washing windows is being designed then looking at existing systems and methods, identifying their strengths and weaknesses together with materials and methods of construction is wholly appropriate. Candidate who seek inspiration for other sources such as nature when designing trophies for sports events are positively rewarded accordingly but are also likely to think and design "outside of the box". However the analytical comments must relate to the problem being addressed and ideally used at the ideas stage.

Strand 3: Candidates will need to:

This is all about writing a "list" of "specific" points that will need to be addressed to enable the design problem being tacked to succeed. The specification expands the brief in specific detail and becomes the scaffolding for the design activity

For 0 to 8 marks what is required: Specification points which are "Specific" to the problem being solved. The generic statements of being "aesthetically pleasing", being "safe for the user" or "have a large storage capacity" have virtually no value because they can apply to other problems and actually mean nothing – they are too vague.
The points need to "point" towards solutions but not be a solution. For example "it will be painted green" in an outcome which limits the design activity. "needing to be an appropriate colour for merging into the location and surroundings" is appropriate. Justification can then naturally follow thus accessing the higher marks in stand 3 of IAO2.

This example might then read: "My solution needs to be an appropriate colour for merging into the location and surroundings so that it does not spoil the natural beauty of the wooded area it will be located in". This allows for scope with the proposed solutions being browns, greens, a

combination, have some “camouflage” option which could be “applied” or inherent in the chosen materials.
The use of ACCESSFM and similar formulas are not suitable for this level of study and often penalise candidates. These are all “writing frames” by a different names, and have their place when introducing product analysis and specification writing but are very limiting at this level. **On no account should the work of 4 x 4 activity (or the equivalent) be included for assessment**.

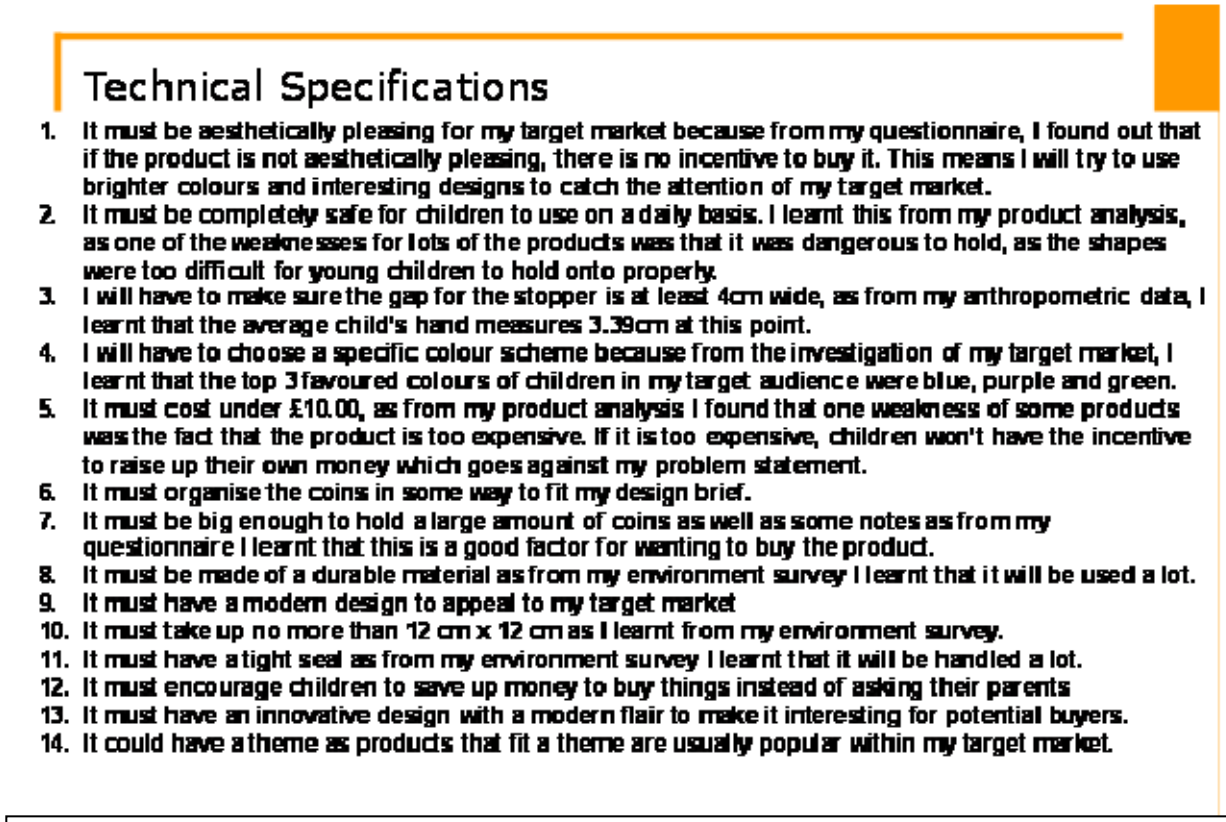
Mood boards were presented in both specifications this session. Centres should note that unless candidates provide significant detailed analysis and justification for the content of the mood board and also indicate in their designing where they have used the influences then no marks can be credited. There was evidence of A3 sheets of cut and paste “mood board” which have no value and the contents are not used or reflected on by candidates. However where correctly undertaken and with suitable annotation, they do have great value and contribute to the structure needed and “out of the box” thinking for candidates.

Suitably annotated mood boards can gain credit depending on the quality of the annotation.

In general the depth and breadth of candidate research was, in many cases, insufficient for meaningful design activity. The results of research, which should consist of a range of appropriate activities, should provide data and other factors to provide direction and restriction for the design process. Often evidence showed that it didn’t provide the data which then hindered the design process.

The use of descriptive ‘theory’ inputs, for example general anthropometric data, is discouraged and will gain no marks. The assessment criteria look for candidates to **‘apply’** their knowledge and understanding of the design influences to their own design activity.
Equally “definitions” of what copyright or patents are cannot be rewarded. The application of such things is rewardable.

Once quality research and analysis have been undertaken IAO2 requires candidates to produce a specification for their chosen design activity. Where candidates **justify** their specification points higher marks will be awarded.



Technical Specifications

1. It must be aesthetically pleasing for my target market because from my questionnaire, I found out that if the product is not aesthetically pleasing, there is no incentive to buy it. This means I will try to use brighter colours and interesting designs to catch the attention of my target market.
2. It must be completely safe for children to use on a daily basis. I learnt this from my product analysis, as one of the weaknesses for lots of the products was that it was dangerous to hold, as the shapes were too difficult for young children to hold onto properly.
3. I will have to make sure the gap for the stopper is at least 4cm wide, as from my anthropometric data, I learnt that the average child's hand measures 3.39cm at this point.
4. I will have to choose a specific colour scheme because from the investigation of my target market, I learnt that the top 3 favoured colours of children in my target audience were blue, purple and green.
5. It must cost under £10.00, as from my product analysis I found that one weakness of some products was the fact that the product is too expensive. If it is too expensive, children won't have the incentive to raise up their own money which goes against my problem statement.
6. It must organise the coins in some way to fit my design brief.
7. It must be big enough to hold a large amount of coins as well as some notes as from my questionnaire I learnt that this is a good factor for wanting to buy the product.
8. It must be made of a durable material as from my environment survey I learnt that it will be used a lot.
9. It must have a modern design to appeal to my target market
10. It must take up no more than 12 cm x 12 cm as I learnt from my environment survey.
11. It must have a tight seal as from my environment survey I learnt that it will be handled a lot.
12. It must encourage children to save up money to buy things instead of asking their parents
13. It must have an innovative design with a modern flair to make it interesting for potential buyers.
14. It could have a theme as products that fit a theme are usually popular within my target market.

There are up to 8 marks for the candidates specification (Strand 3 IAO2) but a further 8 marks can be gained during the design stage (Strand 3 IAO3)

Internal Assessment Objective 3 (Maximum Marks 61)

Strand 1: Candidates will **need** to:

- Generate and record the development of design proposals that are innovative and show flair and imagination
- Consider user needs and issues when developing ideas Consider aesthetics, ergonomics, function and the other design influences
- Appraise design ideas for suitability, value and consequence
- Identify, with reasons for selection/rejection, the chosen design proposal(s) for prototype manufacture
- Use suitable communication techniques, including graphics and ICT, to develop and model design proposals and production systems
- Use modelling to check on the feasibility of design ideas.

This is all about designing, using the speciation and communication skills

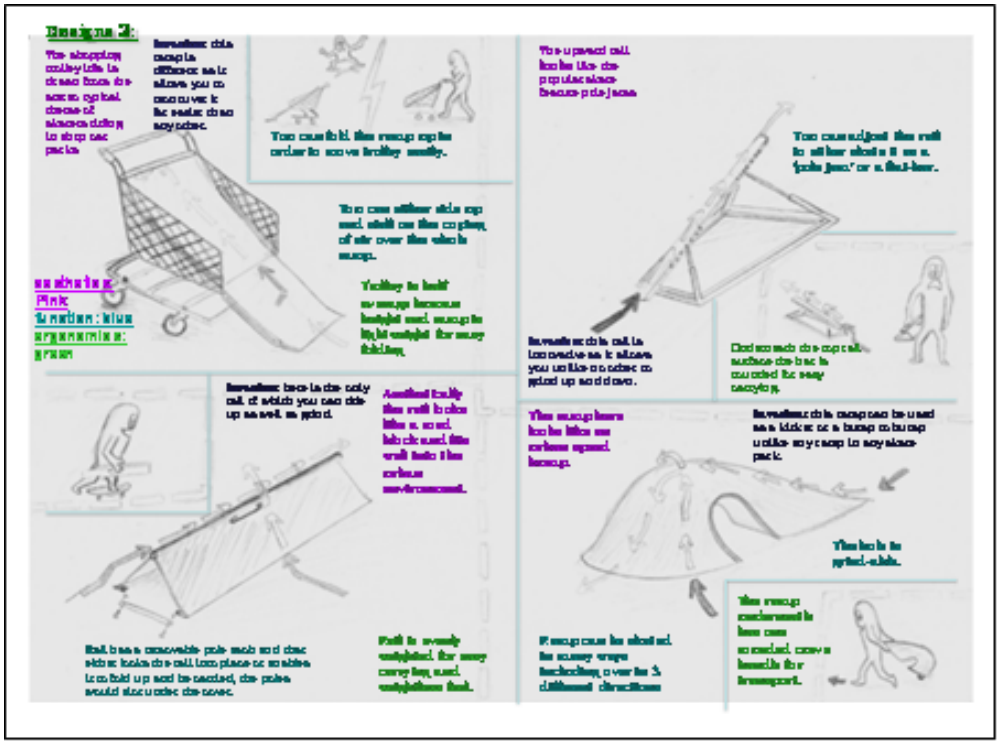
IAO3 has five separate sets of marks in five different strands. A summative approach is shown below:

Strand 1: A range of ideas (with or without innovation and flair) showing Development [0-19] marks ([20 – 25] where there is some "Wow" factor).

Strand 2: Technical content (the design influences, ergonomic, function and aesthetics considerations) [0-10] marks (The outcome of modelling can contribute to this strand) Strand 3: Specification - use and consideration (best during the designing but summative is acceptable) [0- 8] N.B. Strand 4: Communication (other than CAD/OCA) skills showing clarity and confidence [0-8]

Strand 5: Use of CAD [0-10] if used during the design work or [0-7] if retrospective ie drawing(s) of the final design only. There are up to 2 marks available for quality word processing and basic ICT drawings.

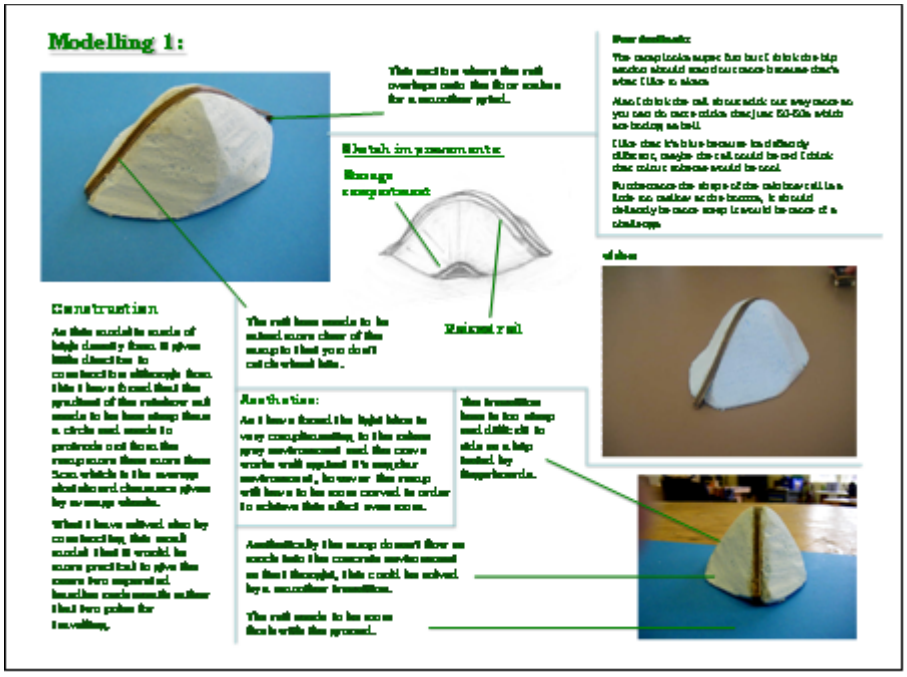
This initial set of sketches gains marks for the range of ideas and also shows excellent confidence and clarity in communication. Using a range of drawing techniques.



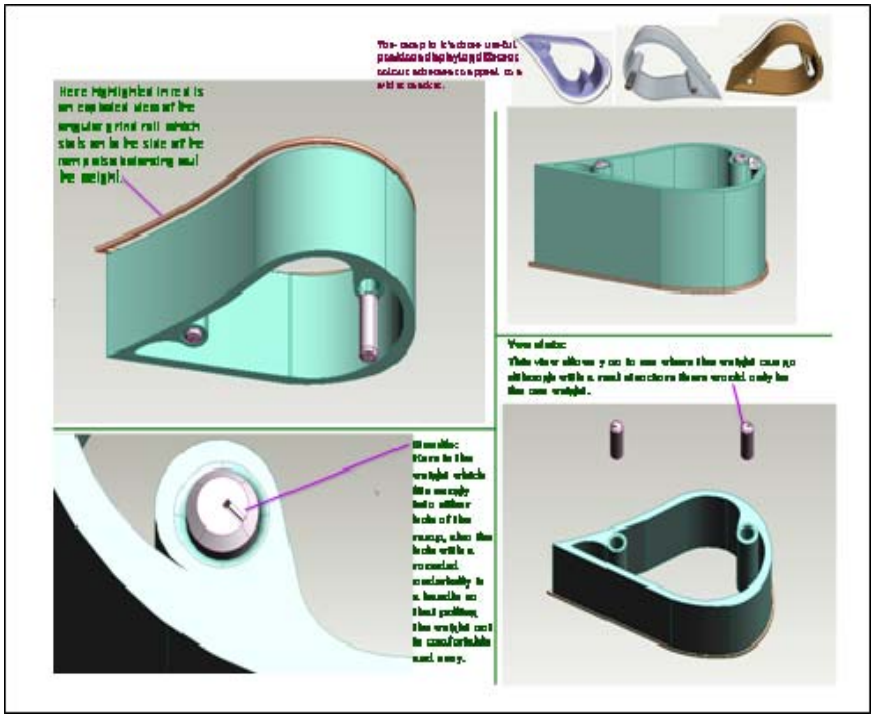
There are notes which refer to both the requirements of the specification (strand 3) and also (strand 2) various design influences. Please note that this candidate also had several other sheets which provided more evidence of consideration of their specification and some of the design influences.

Centres should note that candidates **do not** have to consider all of the design influence but should concentrate on those which are appropriate to the design problem being undertaken.

This candidate also used modelling to test the feasibility of their design ideas.



CAD was also used as design tool rather than a drawing of the completed idea



CAD or OCA should be used as a design tool as shown in the example above and not just CAD as a drawing of a final solution.
Candidates are required to select an idea for development. The ideas and/or the development should be clearly compare/use the design specification.

- For some candidates a formal method may work for comparing against their specification as in this example.
- Where candidates simply produce a grid and tick or cross ideas against specification points there is very limited value and will gain the lowest marks. Similarly a “star rating” has limited value in assessment terms.
- Equally where candidates grade ideas against the specification against a 10 point scale ie 5/10, there is limited value unless there is genuine justification of the reasoning behind the judgement evidenced.

Evaluation of spec points:

summary: as a whole the first design here in blue the tear drop has come of best as it has filled all spec points fully.

Spec points evaluation	Design 1 tear drop. 	Design 2 rainbow rail	Design 3 inflatable.	Design 4 arc inspired quarter.	Design 5 shopping trolley.	Design 6 pole jam rail.	Design 7 triangular rail.	Design 8 bump with hole.
+must encourage riders to get creative	[illegible]	[illegible]	Not really as it was just a rectangle.	It does as it has numerous riding options.	No as it is merely a kicker.	Sort of as it is different to other rails.	Sort of but is a fairly normal rail.	Yes as it is very different to any other ramp.
[illegible]	[illegible]	[illegible]	[illegible]	No as the wheels are very small.	YES of course it's a shopping trolley.	Yes as you carry it at waist height.	Yes as you would carry it at waist height too.	Only a little as the wheels are very small.
+remain stable when hit at speed	[illegible]	Hopefully due to it's size.	No it would be too light.	Yes as it is big enough to stay stable.	Yes as the wheels would have a lock on them.	Should do as it would be heavy.	Yes as it is the triangular shape.	Yes as it is very large.
+the top surface must not remain slippery after rain	[illegible]	Yes as it would be glazed satellite.	No as it was a high density rubber.	It wouldn't much as it would be Skatelite pro.	[illegible]	No and it wouldn't matter as it's a grind rail	[illegible]	A little as it would only be varnished wood.
[illegible]	[illegible]	[illegible]	No as it is too simple.	Not really as the grind rail is fairly tall	Not at all there is no grind possibilities.	Yes as the rail is in a ramp shape.	Not particularly as it is a tall rail.	[illegible]
+ the facility must be no taller than 70cm	Partly it may be 75cm	It wouldn't it would be 40-50cm tall	[illegible]	Yes it would only be around 40-50cm tall.	It would be roughly 80-90cm.	No it would only be 20-40cm	[illegible]	It would be around 80cm tall so no.
[illegible]	Perfectly it would be around 2m	It could be on the verge of 2.5 so no.	[illegible]	It would be around 2.5m exactly.	It would be around 2m long so yes.	It would be around 2.5m long.	It would be 2m exactly	No it would be around 3m long.
[illegible]	Yes it would be 50-60cm	It wouldn't it would be around 70cm wide.	No it would be around 1.5-2m wide.	It would be around 40cm wide.	It would be around 50cm wide.	It would only be around 30cm wide.	It would be 70-80cm wide.	It would it may be around 2m wide.

Satellite Pro=is a non stick waterproof skate surface for outdoor use.

The worst idea? [illegible]

Short but meaningful comments made by the candidate.

Best results are obtained when the candidates 'user' is asked to make evaluative comments on the ideas and/or development.

B803 Coursework – Making, Testing and Marketing products

The moderation process of this unit continues to demonstrate the improving understanding of the specification and interpretation of the two assessment objectives. The quality of work continues to improve.

It is so important that video and sound is packaged properly in the presentation, so that all evidence of work is accessible when it comes to moderation. A step by step of how to do this can be found in the new OCR Product Design for GCSE text book (from Hodder Education ISBN 978 0340 98200 6) which is now available. Too often moderators are getting folders that have video, but they are unable to see it, as the files have not been packaged within the presentation. If moderators are unable to view the work they are unable to moderate it.
.
Internal moderation is an imperative part of the assessment process. It is very important that the rank order of Candidates marks for the centre is correct. Centres must ensure they allocate appropriate time to this task and avoid any alterations to the centres marks.

Teachers are required to authenticate that the work is that of the candidate – This is an OFQUAL requirement. Form CCS160 must be supplied in the sample selected for moderation and be signed by all staff teaching the specification.

Candidates are free to present the work using any appropriate medium, either paper format or in electronic format on CD-ROM using PowerPoint, but not a combination of the two. CD-ROM seems to be the favoured format for this unit and the use of photographs, sound and video is becoming common place.

Centres should be aware that electronic folios are not returned, so should ensure a copy is kept at the centre.

For paper submissions Candidates work should be bound together or contained separately in some secure manner.
Centres should ensure that work for each unit is kept separate. B801 and B803 are assessed separate by totally different moderators.

The use of CAD/CAM is to be encouraged, however, centres are reminded that it is seen as one skill, so Centre's must ensure Candidates demonstrate a range of skills when producing the practical work to achieve the higher marks. If CAD/CAM is used, Candidates should produce evidence that they understand the process and have undertaken the process themselves thus proving that it has "not been done for them". The use of photography and screenshots with annotation should be encouraged.

Centres should ensure prompt response to the request for the sample required for moderation and the subsequent forwarding of moderation samples to moderators. An appropriate postal tracking option is best in the case of work going missing. Centres using Moderation Manager for the first time, should expect an email very shortly after the marks have been uploaded by the centre. If the centre has not received the sample request from OCR (Moderation Manager generated) within 5 working days, centres should contact OCR.

Objective 4.

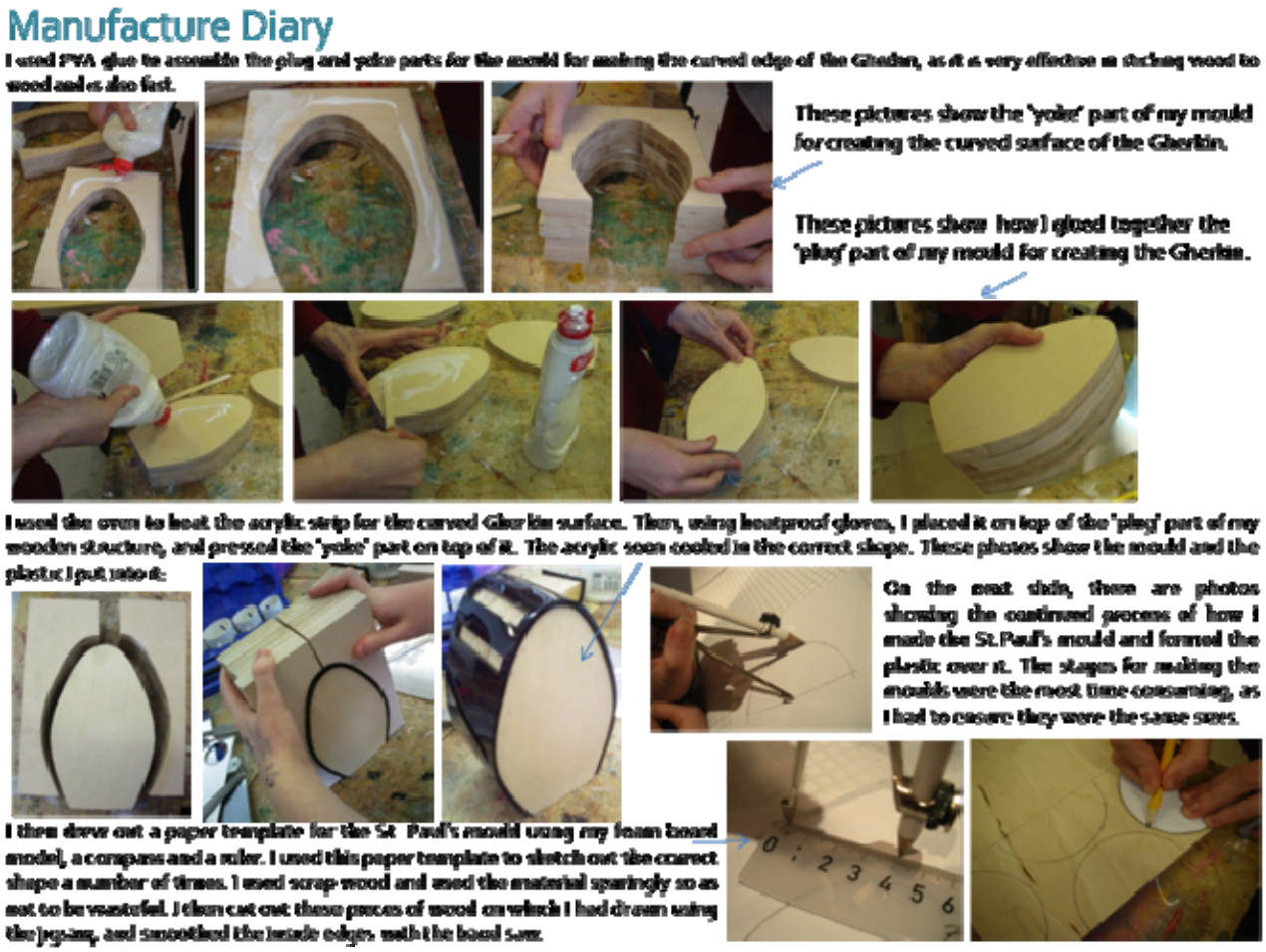
This is all about creating a single, functioning, quality product.

Modelling is not acceptable in this unit. A model will achieve no marks against the "quality outcome" mark (Strand 3 IAO4) for Objective 4. Some excellent models were presented but all centres must remember that the "quality outcome" marks (0-25 out of 55 marks) cannot be gained for models and so this is a detrimental course of action for Candidates.

This year showed a good range of products manufactured, varying considerably in size and complexity. The majority of centres have encouraged Candidates to attempt a realistic product design within the time allowed (20 hours in total for B803)Some centres are clearly spending far too much time on this aspect.

The recording of the manufacture was generally well done with centres encouraging candidates to record their progress in real time. It is clear that candidates are enjoying this type of assessment and the content of the work is to be commended.

Centres must understand this element is purely about suitably annotated photographic evidence and candidates showing ownership of the manufacturing processes and techniques they have used to create their product. Candidates need to be encouraged to keep this as a diary and as they complete a processes they record this in detail, including how they did the process using technical terms, any health and safety considerations, how precision was achieved and economical use of materials.



Above is a good example of part of the production log. Images are "doing photographs", showing how the manufacturing of the product develops are the best photographs to take. The candidate has then annotated the images showing clear understanding of the processes and techniques

used. In the images it can be clearly seen how precision has been achieved and they also demonstrate the economic use of materials.

A written time plan is **not** a requirement for this specification and will not attract marks against the assessment criteria. A limited number of photographs which lack suitable annotation which do not demonstrate Candidates understanding of the manufacturing activity will gain limited marks.

The majority of final products generally demonstrated accuracy. Centres must ensure candidates show a range of images of the final product showing as much detail as possible. The images must be able to justify the marks given to the candidate by the centre. Centres are encouraged to mark this element from evidence that is shown in the folio, as this is what the moderator will also see. It does not matter how good the actual product may be if there is insufficient evidence presented in the folio to support the marks awarded during the moderation process.

Above a range of images have been taken of the finished product. The product is viewed from a range of angles and the photographs allow a judgement to be made about the quality of the product. Candidates should be encouraged to annotate these images if they wish to draw the moderators attention to details or features of the product.

It is useful to moderators if centres provide some idea of scale in at least one photograph; placing a ruler or familiar object alongside the finished product. Alternatively showing the product in context and/or being used by the user(s).

If there is no evidence of a completed and finished product, **the candidate can only achieve a mark in the lowest threshold box** (strand 3 IAO4) but this is providing there has been some evidence of making in the images of the manufacturing process.

Objective 5.

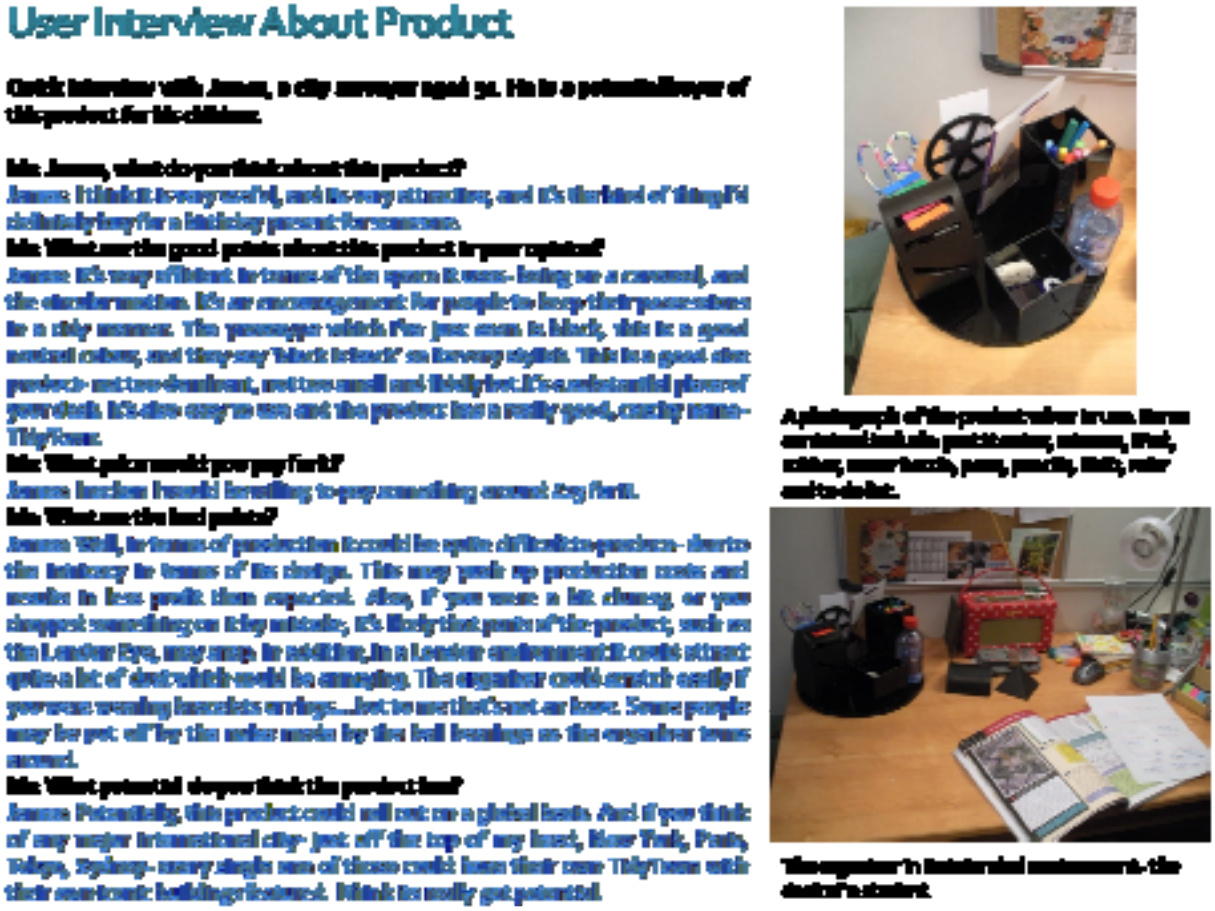
This objective is all about taking the product forward and not recapping on anything that has happened in the making of the product.

No repetition is required in this section, images of the final product or stages of making do not have to be reproduced. Success in this objective relies upon Candidates including clear and justified evidence matching the bullet points outlined in the assessment criteria.

Evaluations were generally well done with specific references being made to the specification. These observations were accompanied by realistic user testing. It is very important that there is evidence of user group testing being undertaken ideally using images, sound or video.

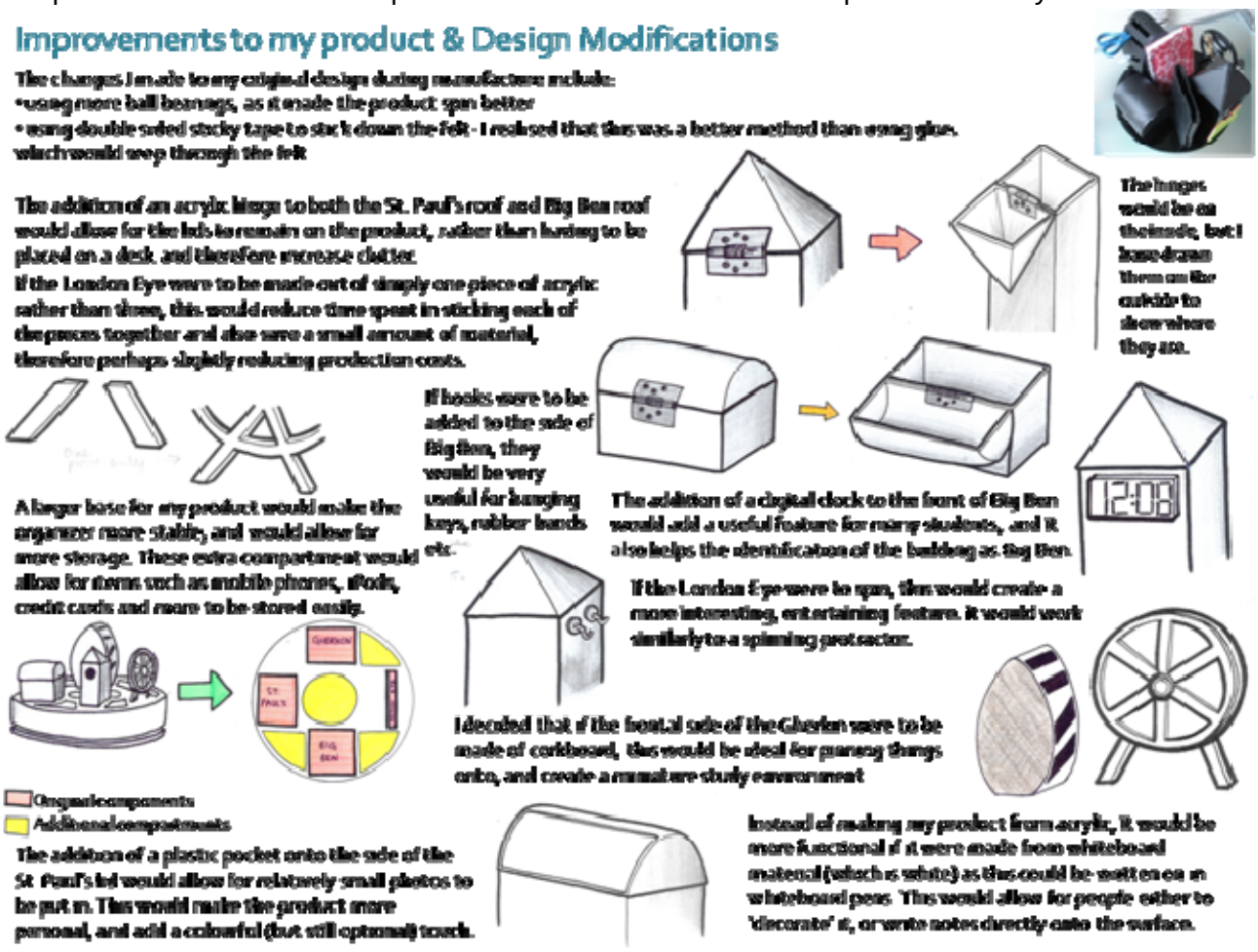
Higher scoring Candidates may well use a prospective client to evaluate the product. They will be critical of their design and make individual detailed responses to each specification point. They will show evidence of user group testing which might lead to suggested modifications. Good video evidence of testing and user evaluation/views is becoming increasingly popular.

Below you can see a good example of where the candidate has interviewed a potential client for their product as a result has obtained useful feedback.
The candidate could therefore act on these responses suggesting modifications their product Stand 2 IAO4).



Modifications continue to be disappointing as candidates are still only offering written options. This is a product development opportunity and candidates should be sketching possible improvements that could be made to their product. Candidates may wish to alter or draw on original images of the finished product or use overlays in an innovative design way.

Below is an excellent response to the modifications element of the unit. A range of modifications are presented as sketches with detailed annotation. This is a skill that is used across all units of the specification and should be practiced to allow Candidates to respond in this way.



Product analysis and product improvement activities can be clearly practiced by candidates because any product can be improved upon with a little skill and imagination. Centres should provide candidates with repeated opportunities to develop this skill through the teaching of technology related subjects across all key stages.

Modifications that took place in the making process will **not** awarded marks in this section; this would be awarded in objective 4.

Quantity production continues to be a very weak area, but it has shown some improvement this session. Responses tend to be very generic based on theory notes or cut and paste information from the internet. Appropriate research needs to be carried out to find out how a similar product would be manufactured in a 'Real World' situation. It is then a case of applying the theory to the manufactured product or **parts** of the product.

Below is a good example where the candidate has explained how parts of their product could be manufactured in a 'Real World' context.

Commercial Manufacture

If my product were to be commercially manufactured, a number of different techniques would be involved. Each of the acrylic pieces would be created using CAD/CAM, and would then be transferred to a laser cutter machine. A laser cutter can be used to cut out the correct sizes for each acrylic piece. This is very accurate, so will ensure that the spinning base is correctly made to fit.

A milling machine could be used to cut the horizontal slots in the side of the Gherkin, before it is heated and bent into shape. Then, injection moulding would be used to create the curved part of the Gherkin.

Instead of creating the Gherkin and London Eye from several separate pieces, it would be better to make them from one piece of acrylic. This could be achieved by injection moulding.

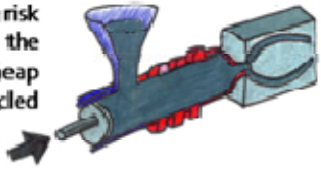
Rough grade files followed by increasingly smooth files would be used to remove any scratches on the acrylic pieces. Also, fine grade silicon carbide paper (wet and dry paper) wrapped around a block of wood would be used to improve the finish. A buffing wheel could then be used to make the acrylic more shiny- it has a polishing compound which shines up edges to perfect the finish.

Solvent adhesive would be used to melt the components together as this is much stronger than Tensol cement. It seeps into joints using capillary action and evaporates quickly, welding the two pieces.

Templates would be used for creating the same shape for the Gherkin and St. Paul's 'yoke and plug' moulds, as this would ensure consistent sizing. The wooden moulds would be made by machines such as the mounted jigsaw.

My desk organizer would be batch produced, because it is unlikely that it will be in such high demand so as to be mass produced. This would also cut down on resources as it would limit the risk of overproduction due to low demand, and would therefore be more benefitting to the environment. My product would be made out of acrylic (polymethyl methacrylate) as it is a cheap material, and can be bent using heat. The wooden moulds would be made from scrap/recycled wood, perhaps MDF.

I drew this sketch to show how the gherkin would be made using the injection moulding technique.



The marketing presentation section continues to improve with centres now approaching this in a far more innovative way. The marketing presentation or the "sales pitch" (stand 4 IAO5) is an opportunity for the Candidates to promote their ideas through an innovative presentation to a prospective manufacturer, supplier, buyer, user or retailer of the product.

Many very good examples were seen. These included TV commercial type videos, adapted pages from magazines, with the product cut and pasted onto the page; web based selling; billboards and fake celebrity endorsements. **To achieve the higher marks however, the end result should be realistic and professional in appearance accompanied by a <u>good explanation</u> for the idea of the marketing strategy and the reasons for choosing the particular method of promotion.**

Some high performing candidates produced videos or placed their product in a promotional context. Centres are beginning to introduce a marketing strategy explaining the reasoning behind the type of marketing presentation. Weaker candidates produced poor quality posters.

Above is a innovative approach using just a simple poster. The candidate has written lyrics for a "jingle/song" and implies the product is being endorsed by a celebrity. You can see the candidate has attempted, with some success, to cut out the image to give a more professional finish to the poster/advert.

B802 Designing and Making Innovation Challenge

General Comments
It is clear that candidates have enjoyed the work they have carried out during the 'challenge' with many students reflecting positively on their experience. All four of the challenge themes have been selected by candidates with 'A day at the beach' being the most popular. The Innovation Challenge continues to be appropriate to candidates of all abilities with the overwhelming majority of candidates completing all sections of the workbook.

Administration
Examiners have reported fewer problems due to centre administration errors in this session. It is however important that teachers make examination officers aware that the examination takes place in three separate stages and that workbooks should not be sent to examiners until all of the three stages are complete. To avoid delays and unnecessary 'missing script' investigation work for both OCR and the Examination Centre it is important that examination workbooks are posted to examiners as soon as the 'Time to Reflect' activity has been completed.

Centres are reminded of the requirement to submit details of the dates of the Innovation Challenge to OCR using the VAF form. A number of centres failed to submit this form before the given deadline this session. Copies of the form are available on the OCR website – www.ocr.org.uk.

The Innovation Challenge is designed to take place within a time window of the 1st May to the 23rd June. Centres are not allowed to run the Challenge outside of this window.

All materials relating to examinations sent from OCR to centres will be dispatched to the examinations officer. It is important that colleagues check with the examinations officer that they have received all relevant and most up to date information prior to starting the Innovation Challenge activity.

Examination notices must be displayed in the area where the examination is to take place and an invigilator should be present. Students should work in silence unless otherwise instructed by the teacher script.

Running the Challenge
Centres are reminded that the role of the teaching colleague is that of a facilitator and not that of a normal classroom teacher. They are there to provide access to materials, monitor health and safety issues and read the teacher script to candidates, elaborating and explaining where this is indicated within the script.
Teaching colleagues and support staff must not give advice to students about the design/manufacture of their prototype product or cut materials to correct shape or dimension for students. It must be made clear to all candidates that this is an examination and we are assessing the individual student's designing and modelling capability.

Photographs
Examiners have reported concerns about the quality of photographs from some centres. Problems include: photos being printed at low resolution, photos being printed that are too small (approx postage stamp size), photos being printed on printers that are low on ink and photos that do not clearly focus on the model.
Photographs form an essential part of the assessment process. Photographs must be good quality colour images that are of an appropriate size to fit into the space provided.

The addition of a card with the candidates name within the photo aids the return of photos to students. Centres are reminded that four "teacher" photographs is the minimum required. Additional photos can be added to the workbook. This is particularly important if it is necessary to show other parts or views of an artefact to fully illustrate the final outcome.
It is recommended that if candidates wish to annotate photographs that a second print is produced and stuck into either the appropriate section of the workbook or into the 'additional space' and clearly labelled and then annotated.
Candidates should be encouraged to stick photos into the workbook as they are printed.

Completion of the workbook
Examiners have again reported difficulty in understanding student's work where either blunt pencils, highlight pens or gel pens have been used for written work. Please advise candidates of the need for all of their work to be legible.

Security of Workbooks
Centres are reminded of the importance of appropriate security of all workbooks between the three sessions of the Innovation Challenge. Workbooks must be returned to the examinations officer and should be stored in secure conditions.

Development of design. Evolution through making.
Initial Thoughts
Candidates used a mix of text and drawings to explore the given theme. The majority of candidates produce a range of initial concept ideas and think creatively about the problem and the supplementary information.
Examiners have expressed concern that some candidates approach the challenge with pre-conceived ideas and fail to respond to the given supplementary information. This results in candidates failing to gain the marks that are available for doing so.
Candidates should be encouraged to take risks and think creatively about the design problem.

Briefs
Design Briefs identified by candidates continue to be poorly written. Design Briefs are often too prescriptive with many candidates confusing the design brief with the specification. Candidates should be encouraged to write clear and precise design briefs that offer scope for creativity.

User/Clients
The majority of candidates identified appropriate user groups for their products. Higher performing candidates gave clear consideration of their user group whilst undertaking the design activity making clear reference to the target user and user needs.

Specifications
Specifications from many candidates were disappointing and often failed to go beyond the information given in the challenge theme or contained only vague, generic points which could apply to almost any product. It is essential that candidates understand what a specification is and how to write a specification if they are to be successful designers. They should be encouraged to write detailed, justified, specific points about their proposed design. A bullet pointed format was seen to be of assistance to higher performing candidates.

Ideas
Students used a mix of drawings, text, annotation and occasionally modelling/photographs to show their ideas. Lower scoring candidates reproduced the initial thoughts from box 1 of the challenge activity and disregarded both the design brief and specification from boxes 3 and 4. Higher performing candidates produced a range of creative ideas that clearly related to their design brief, specification and potential users. Drawings of both full designs and parts of designs were provided along with detailed annotation relating to materials and construction methods. Development of the design from the 'initial thoughts' was clearly evident. Designs were 'rendered' to enhance communication.

Supplementary Information
It is important that the theme sheet is read through with the candidates and the appropriate challenge identified along with the supplementary information. Marks are awarded for responding to the supplementary information. A number of candidates have failed to respond to the supplementary information given.
High achieving candidates responded well to the supplementary information and gave clear reference and consideration to it throughout their design work.
Centres should be cautious of over preparing students for the examination from the pre-published theme sheets. Examiners felt that on a number of occasions candidates approached the examination with pre-conceived ideas. This obviously limits the candidate's opportunity for responding to the supplementary information.

Communicating information through sketches, writing and photographs
The standard of design communication was generally good. Candidates presented their ideas using a range of annotated drawings and text. Higher performing candidates gave different views of objects or parts of objects and clearly communicated their design thinking through the use of notes and annotation. Examiners felt that many candidates work could have been enhanced with the use of rendering techniques and that centres should encourage candidates to be more adventurous in their forms of communication.

Written communication is generally good but many candidates fail to use technical vocabulary when this is appropriate.

Materials, Components, Processes, Techniques and Industrial Practice
Examiners have reported that the majority of centres have prepared their candidates well for this part of the examination. Candidates from these centres clearly understood that they were making a model rather than a 'final' product. Appropriate materials were supplied by these centres for candidates use. These materials included foam, foam board, card, balsa, modelling clay, mechanism kits and polymorph.
It is essential that during the product design course students undertake modelling activity in order to develop their manufacturing skills and knowledge of modelling materials.
Examiners reported that some candidates whose design work was of a good standard were limited by the materials supplied by their centres. Sheet materials such as MDF and Plywood are often unsuitable for modelling. These materials often limit the candidates ability to model designs appropriately and/or impact upon the candidates design work. Where these materials were used, the candidates' work was often incomplete because candidates were trying to manufacture 'final outcomes' rather than 'prototype products'. Examiners have also noted that some centres have used 'junk' materials such as yoghurt pots, ice cream tubs and washing powder boxes for modelling. The use of these materials often results in a poor quality model/prototype.
Candidates must produce their own models. Using existing products such as a child's toy and simply sticking wheels to it will not gain high marks.

Higher achieving candidates considered the choice of materials and components available and identified the most appropriate materials for the manufacture of their product demonstrating adept use of these materials. They completed their models to a high standard and the model they produced accurately reflected their design.

Analysis of ideas, models and prototypes

Peer Evaluation
The majority of candidates planned for the presentation and recorded the outcome. Clear evidence was seen of candidates using the feedback to further develop ideas. Occasionally, candidates failed to record the feedback or planning for this activity.

Development of ideas
Design development varied considerably between centres. Higher achieving candidates show clear development of their ideas between box 1 'initial thoughts' and box 5 'initial ideas'. They also show development between box 5 'initial ideas' and box 8 'developing your idea'.
It is important that candidates use notes or annotations to show how they are developing their design towards an optimum solution that satisfies the design brief, specification and needs of the user. Producing a model of the initial idea or redrawing the initial idea does not show development of the design and therefore will gain no marks for design development.

Evaluation
Many candidates produced detailed evaluations of their prototype product. Higher performing candidates considered each of their specification points and completed the 'fast forward' section with detailed information about the future product.

Reflection
Examiners have reported that responses in this section of the workbook have improved. Students are correctly focussing on the product design rather than the model they have produced. It is essential that students use the 30 minutes available to read through their workbook and reflect upon the activity they undertook. They should identify strengths and weaknesses in the design and suggest detailed alterations/improvements. Where design alterations are proposed these should be drawn and clearly communicated. Cursory written comments will not attract high marks.

B804 Designing Influences

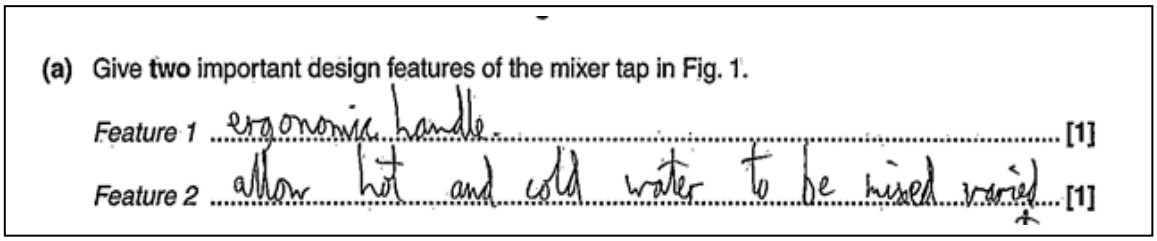
The questions and the tasks on these examination papers seem to appeal to the candidates, engage their interest, and encourage them to reveal a commitment to the subject. The paper provided a suitable challenge to the students and successfully enabled the vast majority of candidates to access the paper fully and to attempt every question. In nearly all cases, it was clear that candidates had carried out their research into designers and design eras. As with previous sessions, the design section was well answered and in general an improvement upon previous examination sessions.

The development section is now well produced with candidates systematically developing the idea whilst evaluating their ideas against the specification. Once again, the weakest feature of the design question is the four specification points.

Comments on individual questions

Question 1 - The Mixer tap

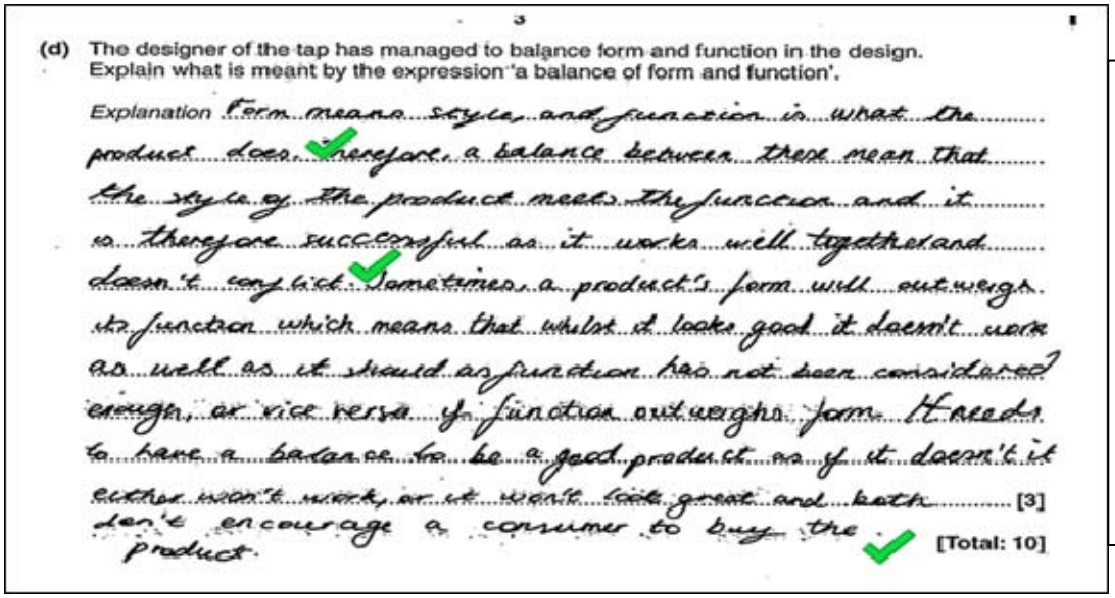
Where Candidates have been well practiced in the skills of product analysis, the identification of two design features was straightforward, and the majority of answers correctly identified the long, single, adjustable spout, the comfortable hold, and the sleek, curved, attractive look. In the second part of this question most candidates were able to correctly identify two benefits of the mixer tap with responses related to ease of use, more sensitive control of both flow and temperature, and less effort needed to operate. The relevant anthropometric data (average hand size, finger sizes and arm reach) was usually correctly mentioned along with references to the size of the handle and the reach of the spout. Along with aesthetics, ergonomics, anthropometrics, fashion, obsolescence, and all of the other design influences, candidates do have to know and be able to apply knowledge of both form and function to a range of product analysis exercises. The relationship between these influences raises important design issues. Candidates must be able to confront the implications of the issues and make a sustained argument in favour of some of the important design movements that put form before function (Mackintosh), form following function (Arts and Crafts), or as in this case of a balance of form and function in proportion to their importance to the requirements of the product.



(a) Give **two** important design features of the mixer tap in Fig. 1.

Feature 1 ergonomic handle. [1]

Feature 2 allow hot and cold water to be mixed varied [1]



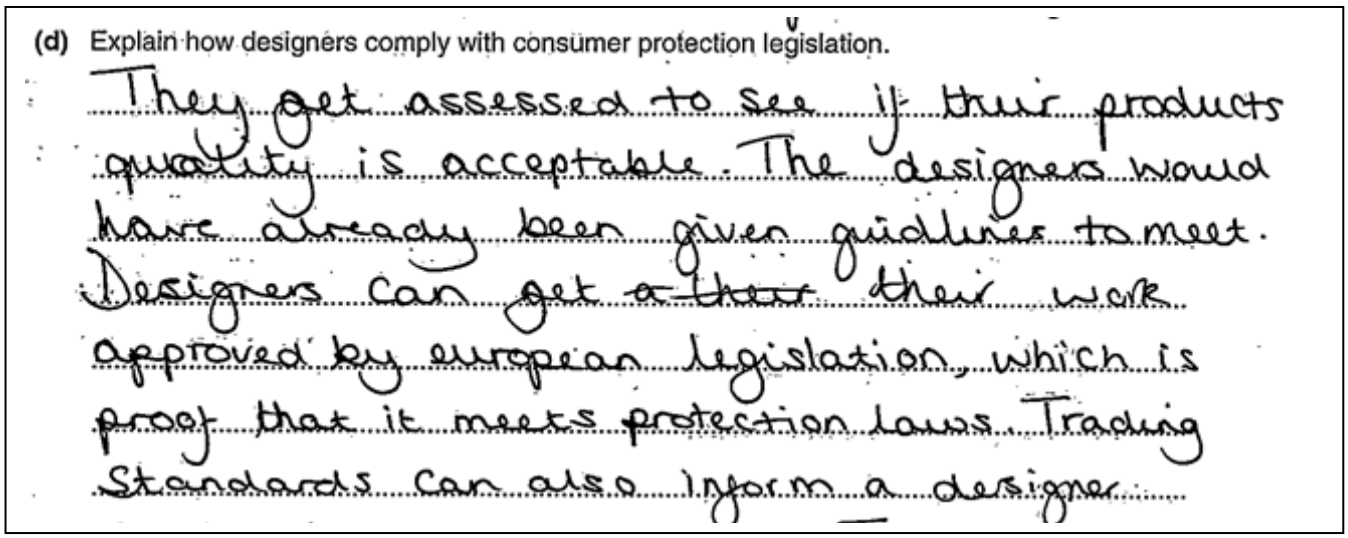
(d) The designer of the tap has managed to balance form and function in the design. Explain what is meant by the expression 'a balance of form and function'.

Explanation Form means style, and function is what the product does. ✓ therefore, a balance between these mean that the style of the product meets the function and it is therefore successful as it works well together and doesn't conflict. ✓ Sometimes, a product's form will outweigh its function which means that whilst it looks good it doesn't work as well as it should as function has not been considered enough, or vice versa if function outweighs form. It needs to have a balance to be a good product as if it doesn't it either won't work, or it won't look great and both don't encourage a consumer to buy the product. ✓ [3]

[Total: 10]

1d Many candidates showed clear understanding of function and form reflecting regular and efficient product analysis activities undertaken during their course.

Question 2 - The Play Mat
The identification of two design features of the play mat was generally well attempted with references to interesting, educational and stimulating patterns, non-toxic, fire retardant, durable and washable fabrics, and easy to fold up and store.
The suggestions for two tests that could be carried out on the product before quantity production were also generally well attempted with responses relating to flame tests, wear and durability test, wash tests, rip tests and consumer rating tests.
Almost all candidates correctly identified Computer Aided Design; however, in the next part of this question, many candidates gave responses highlighting the benefits of CAD, rather than reasons why designers may choose not to use CAD. Understanding of consumer protection legislation was not well known, often being confused with patents, trademarks and copyrights.


(d) Explain how designers comply with consumer protection legislation.

They get assessed to see if their products quality is acceptable. The designers would have already been given guidlines to meet. Designers can get a their their work approved by european legislation, which is proof that it meets protection laws. Trading Standards can also inform a designer.

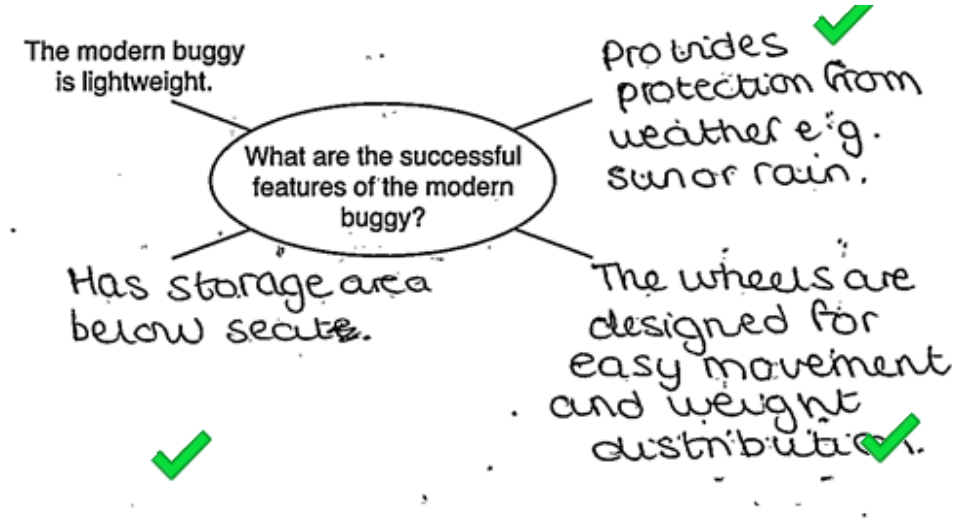
Question 3 - Design features of a modern buggy
This question is always popular and well attempted. Most candidates were well able to identify three successful features of the modern buggy related to the ease of manoeuvrability, better protection for the child, the storage facility, able to be folded up, lower centre of gravity of the child, and suitability for all terrain use. Explanations of why the identified features make the buggy successful were also well attempted with most candidates scoring 3 or 4 of the marks available.

The most common answers were: pivoting front wheel allows for easier manoeuvring in crowded supermarkets; the use of hinges and locks to allow the buggy to fold up; folding arrangements allows it to fit more easily onto busses and into cars, and the lower centre of gravity allows the buggy to be tipped back easily and negotiated up steps and pavements.

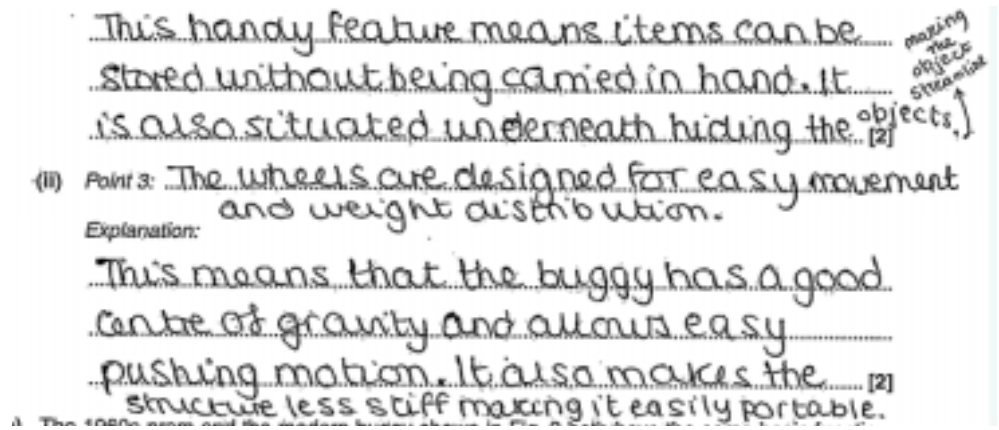
Explanations of why the basic design of the buggy has changed over the years proved discriminating. Many candidates gave examples of „what" has changed with the buggy over the years rather than why the changes have taken place.

Clearly, candidates need to be careful with their reading of this kind of question to ensure they provide creditable responses. Essentially, this question required references to changes in lifestyle (more mothers now have a car and need a buggy that will fit in the boot), advances in technology that have led to the use of new materials and fittings, greater awareness of child needs to sit up and to see out, and changes in fashion.

Comparisons of examples of modern and traditional products that perform the same basic function should provide exciting teaching opportunities in product analysis. Past examination papers can provide appropriate examples, however many centres are coming up with their own ideas based on familiar items found in the kitchen, the bathroom and the toy box.



3a Three successful features of the modern buggy are required. This is not a "spot the difference" in the images provided but an opportunity for candidates to apply their knowledge and understand gained through regular product analysis throughout the course.



3b This part of the question requires candidates to fully expand on their initial point identified in part a of the question. Repartition of the details in part a will gain no reward – the candidate needs to "move on".

Question 4 - Trendsetter and Iconic product

Alec Issigonis, Andy Warhol and Yves St Laurent had been well researched and were well represented in many of the answers to this question. Infrared and vegetarianism were equally well researched but less popular. In preparing for this question, candidates need to be very clear that marks will be awarded in 4a for information about the Trendsetter and that marks will be awarded in 4b for information about their Iconic product. Knowledge about the Mini Cooper, the Kaftan and the Campbell's soup painting gain credit in 4b. Knowledge of the important influences (other than the given Iconic product) and the long-term legacy of the Trendsetter have to be explained in 4a. Candidates have to be especially careful to avoid repeating the same information in 4a and 4b, and to ensure that they give information in 4a that focuses on the Trendsetter rather than the Iconic Product. More and more candidates are choosing to study and research two Trendsetters and two Iconic Products and in some ways this has a lot to recommend it. It allows the candidate more scope when completing their examination. Some Trendsetters have much more interesting achievements to consider (Andy Warhol for example), and some Iconic Products have a greater number of innovations to reveal (the Mini Cooper for example). Also, by studying two Trendsetters, a candidate then has a choice when answering the design question.

Question 5 - Design

The formulation of the four specification points at the beginning of this question continue to be of concern to the examiners. Many candidates score no more than one or two marks. For full credit, candidates must provide four discrete points that have not already been given in the question paper, so references to the Trendsetter (eg Warhol), or the Iconic Product (eg Campbell's soup painting) will gain no credit. References to the requirements outlined in the need (e.g. 'one piece', 'hat', 'Warhol', 'exhibition') cannot gain credit.

Candidates have to use their knowledge of the Trendsetter and the Iconic Product, together with their analysis of the requirements of the need to formulate 'new' points. For example:

The design must use repetitive images of an everyday object;

The design must be 'flat pack' for easy storage;

The hat must be easy to put on and take off; and

The hat must have screen-printed decoration.

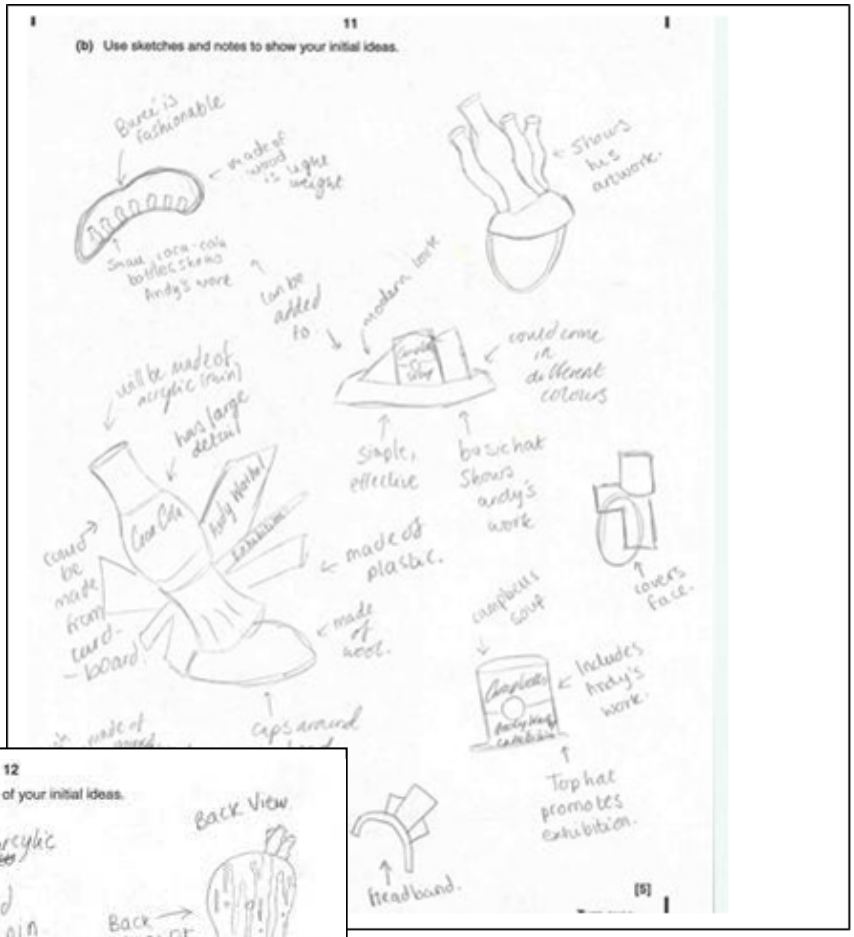
Generic points (eg strong, bold comfortable) and negative points (eg no sharp edges, not too heavy, no loose bits), can gain no credit.

Clearly, the purpose of the specification points is to help the candidate focus their thoughts on viable design ideas. Time spent 'thinking before writing' the specification points, will not only improve the mark score in section (a), but also help the candidate improve their performance in all of the other sections of this question. To score well for the design ideas part of the question, candidates must provide a range of different ideas, each with explanatory notes (rather than just labels), and with some indication that some aspects, of some of the ideas, address at least two of their specification points. Typically, candidates score 3 or 4 of the available marks for design ideas. In order to move beyond two marks in the development of ideas part of this question, candidates must provide clear evidence, in the form of sketches and notes, of developmental activity and decision-making.

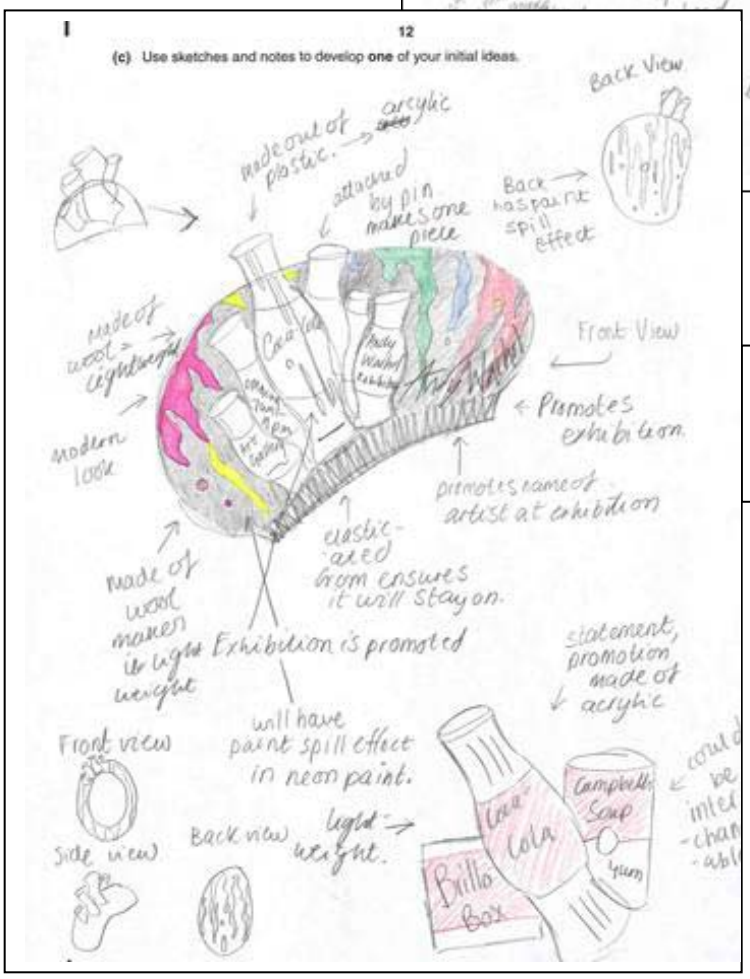
For the final part of question 5, it is important for candidates to provide confirmed details of their final solution including references to materials, ingredients or components, with sizes, dimensions or quantities, together with joining or mixing techniques, and indications of tools and equipment that might be appropriate.

The notes and explanations of how the final solution meets each of the specification points are not generally well attempted. Candidates will often just say, for example, that "*my idea meets specification point 2*". For the award of a mark, it is necessary for the candidate to explain how the solution meets a particular specification point, for example, '*the hat will be made from one piece of thin card that is printed with 50 images of a can of beans to represent multiple images of an every day object.*'

This particular requirement for a justified evaluation of a design idea is a key skill in Product Design as it permeates other units in the qualification. It is also a very useful 'life skill' for when the candidates become consumers. This skill does have to be rigorously taught, until it becomes part of a completely natural approach to evaluating products.

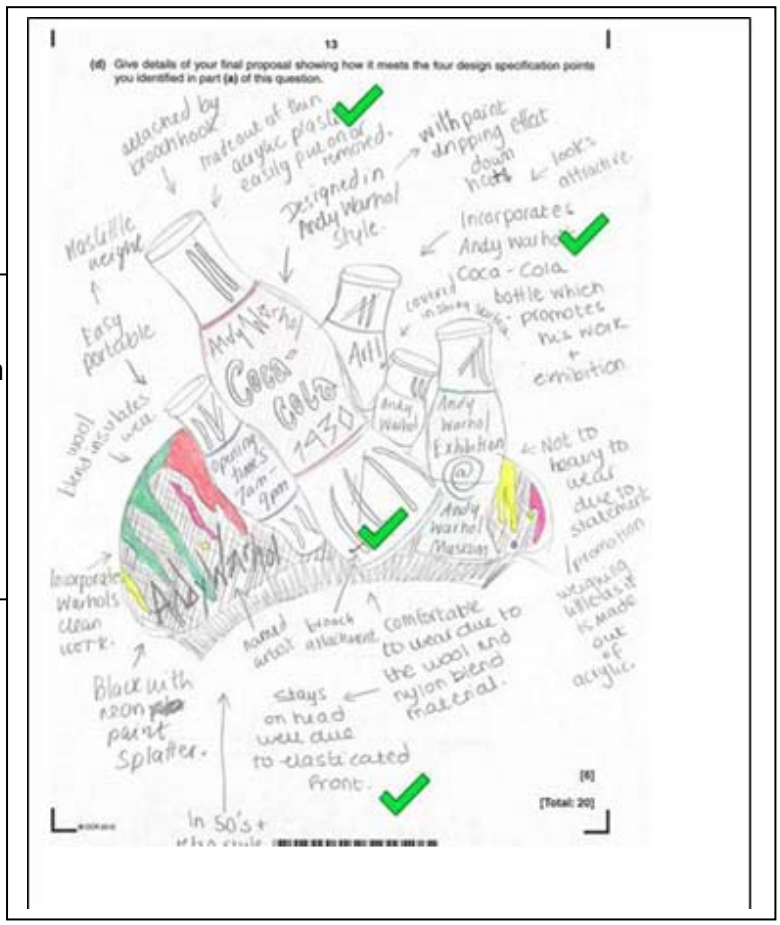


5b A range of ideas related to the design need and the candidates own specification using sketches and notes



5c moving the design(s) forward using drawings, notes (not labels) and satellite sketches

5d Notes and associated sketches showing details of how the design meets all 4 specification points with some reference to manufacture. This is a “good” attempt but lacks the depth and references to manufacture for the full mark allocation to be awarded.



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