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

January 2009

J901/J900/MS/R/09J

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of pupils of all ages and abilities. OCR qualifications include AS/A Levels, GCSEs, OCR Nationals, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new syllabuses to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support which keep pace with the changing needs of today's society.

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 syllabus 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.

Any enquiries about publications should be addressed to:

OCR Publications
PO Box 5050
Annesley
NOTTINGHAM
NG15 0DL

Telephone: 0870 770 6622
Facsimile: 01223 552610
E-mail: publications@ocr.org.uk

CONTENTS

General Certificate of Secondary Education Product Design (J901)

General Certificate of Secondary Education (Short Course) Product Design (J900)

REPORTS ON THE UNITS

Unit/Content	**Page**
Chief Examiner's Report	1
B801 Coursework – Developing and Applying Design Skills	2
B802 Designing and Making Innovation Challenge	14
B803 Coursework – Making, Testing and Marketing products	18
B804 Designing Influences	25
Grade Thresholds	29

Chief Examiner's Report

General Comments

The January 2009 examination session saw the use of Moderation Manager which was accessed through the OCR interchange. This has proved to be very successful with the reduced administration and speedier contact between centres and moderators.
Centres are respectfully requested to ensure that the email address for the recipient within the centre is both accurate and kept up to date.

Centres are reminded that for Unit 1 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.

Entry codes for this unit have been streamlined from this January with B801/1 or B803/1 being the entry codes for either a paper portfolio or a CD - ROM submission. This should save centres considerable admin time.

All centres are reminded that there are separate moderators for B801 and B803 and completely separate administration is required.

The submission of the CSF (Coursework Summary Form) along with the 2nd copy of the MS1 (Mark Sheet 1) is required to be sent directly to the Moderator on or before the 10th January for January entries and 15th May for May entries. A number of centres forwarded all the necessary paperwork to the moderators on or before the 10th of January 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.

A good number of centres have adopted the practice of submitting the full cohorts portfolios on one CD-ROM which is both effective for centres and for moderators. This was suggested in the June 2008 report to centres and it is heartening to know that this has been taken on board. 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 lessen costs for centres with the number of CD-ROM's needed and also postage costs.

There have been a number of instances where centres have submitted a mark breakdown on either the CSF (Coursework Summary Form) or equivalent for each separate teaching group. This is not acceptable as moderators workload is increased significantly.
Centres are advised that candidates mark breakdowns should be presented in candidate order for the whole centre which will be the same as that on the MS1.
Moderators will be instructed to return CSF or equivalents to centres for this problem to be rectified should it occur in future. This of course will cause additional work for centres and delay the moderation process both of which should be avoided.

Increasingly many centres are producing their own mark breakdown sheets in excel format which will allow for automatic totalling but also allows the data to be "sorted". If centres could then provide the candidates mark summaries in electronic format this will greatly assist moderators in their sample selection. It will also reduce printing costs for centres. Several centres did just this in the June 2008 examining session and their action was greatly appreciated.

Centres should be aware of the textbook written in support of this specification which will be available in the spring from Hodder Education ISBN 978 0340 98200 6.

B801 Coursework – Developing and Applying Design Skills

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

Based on the evidence seen for this January's examination session there are areas of the Product Design Specification where candidates need to show improvement and this reflects previous sessions, including:

- Improved **communication** skills which should include 2D and 3D sketching and rendering. Much of the work presented had communication of a low order but where centres taught those skills work ranged from good to excellent
- The selection of non teacher lead and appropriate **start points** i.e. "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 were seen once again. A large number of centres "over prescribed" the start point which severely restricted candidates accessing the assessment criteria
- Identification of a suitable user or user group. Once again a significant 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 really handicaps the design process
- 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
- Consideration and reflection of the situation and the user throughout the design activity. 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 stand 3 of IAO3
- 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 is ignored. The whole portfolio 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
- **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.
- Appropriate use of **CAD** or Other Computer Applications (OCA) 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
- Production of a **range** of detailed **ideas** with reflection of the user and other design influences (Page 34 of the Product Design Specification). 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 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 one 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 mealy 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 e.g. "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 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 one 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 one mark:** A candidate who takes on a challenging or risky activity or steers their design work with a social conscience for example "I will only consider recyclable materials in my designs because……" (It will be the "because" or the "why" which is important) gains the 6th mark in IAO1. It is not rewardable for the candidate to merely say "I will do ……. because I will be taking a risk". There needs to be something tangible for the award of this mark.

As has been 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 submarine, eco friendly house or a space centre 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 t access the assessment criteria.

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 limit their design activity. This is worrying when candidates clearly state that this is the case and reflects on an inappropriate centre approach.

Once again most candidates gained marks in IAO1 again with 3 and 4 being awarded most often. The work represents about an hour's candidate 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.

Examples of a very good "situation" and excellent "evidence" for the situation is shown below.

N.B. Internet hyperlinks <u>must not</u> be used but are quite effective if used within a presentation.

The use of supporting electronic and ICT activity is on the increase and gives candidates the opportunity to develop these whilst accessing marks against the assessment criteria.

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 controlled assessment (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.

Internal Assessment Objective 1

User Group

My target user group is sanitary disposal workers. My aim is to design and then manufacture a product that makes the very unpopular job of litter collection a lot easier to do.

Design Brief

I intend to design and model a new litter picker.

My design will offer the user a more efficient way to clean up litter. My design will decrease time taken and reduce effort needed to do the job.

My design should be able to solve all currently existing problems.

Need for my Product

Picking up litter can be a real chore and can get very tedious when having to pick up each piece of rubbish separately. Also you need both of your hands because you have to hold the litter picker in one hand and the bin bag in the other. Also, as the bag opening is very loose you constantly need to re-open the bag to put the rubbish in. The only product that has currently been invented to solve this problem is a ring to keep the plastic bag open. Nothing automated or motorized has been manufactured as of now.

Innovation and Risk

My Idea is innovative because there are no other products that have been designed to solve this problem. This is a product that has never been seen before. One of my main problem could be with any electronics or mechanics, such as motors, that I may need to do. I have little experience in this field so it could be quite problematic for me.

Opportunity for Mass Production and Manufacture

My product has an opportunity to become very successful because it is an original product that as yet to be mass produced. If it is a success then a copyright could be bought to ensure it is a one of a kind and could only be bought from me.

The market for this particular product is not very large as it is aimed at only one job. It could though be sold to the government to increase the efficiency of pavement cleaners nationwide.

Many private companies or businesses could buy these to clean up their own grounds.

There are also several charity organization who have litter collection days. My design should make these schemes more thorough and time efficient.

CLICK TO PLAY If Video does not play first time then return to previous slide and retry.

Interview

I have gone out an interviewed the man who picks up litter in my local park about what he thought of my product.

Q. Do you find it tedious to pick up rubbish one piece at a time?

A. It isn't so much of a problem whenever there isn't much rubbish about because I don't need to pick up a lot but when there's a big patch of rubbish it very annoying cleaning piece by piece. The most I can pinch at a time is two or three wrappers.

Q. Do you find it difficult to put the rubbish into your bag?

A. Most of the time it's fiddly but not impossible. The bag usually closes up when I walk though and it wastes a lot of time. Wind though is a whole other matter. Trying to keep the bag open is completely useless as the bag does what it pleases.

Q. What do you think of my product and, if it was on the market, would you buy one?

A. If your product delivers all that you have told me it will then yes I would be glad to buy one. It seems as though you've solved all of the problems that I often face in my day to day job.

Internal Assessment Objective 2 (Maximum Marks 23)

Candidates will need to:

- examine the intended purpose of the product;
    - **For 6 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 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 this strand 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.
- identify and collect data relevant to the product(s) and its users;
- identify opportunities for developing new and innovative products to improve upon the weaknesses of existing products
- understand the issues that expand and detail the requirements of the product;
    - **For 0 to 7 marks what is required:** Analysis and evaluation of existing, appropriate or inspirational products. If some method of feeding a goldfish 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 architecture when designing mood lighting or fishing tackle boxes when solving a jewelry storage problem 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.

- demonstrate an ability to express the results of research and analysis in the form of a suitably detailed specification.

For 0 to 8 marks what is required: Specification points which are "Specific" to the problem being solved. The generic statements of being ascetically pleasing or being strong or easily stored have virtually no value unless they are clearly related to the specific problem in hand. Where points are justified to inform and clarify the specific specification points then the higher marks can be awarded. The use of ACCESSFM and similar methods 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.

Mood boards were still evident in 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 still 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.

In Depth Analysis Of Similar Products continued

Product A

Line 6 pocket pod Guitar amp

5) Safety

In product A the designer has made the product so that it does not have any sharp edges this makes it safer than product B that has hard corners that could lead to injury if dropped on a foot for example or damage surfaces. Protective caps have been put on the edges of product B which shows that the designer has thought about safety issues.

6) Size

The size of product A is very proportionate to the size of the average hand so that you can hold it in one hand and turn Knobs and press buttons with the other. Though product A could do with being slightly thinner so you could fit it into a pocket easier and also it would look better that way. I think the size of product B is very appropriate but may look better if it was I little bit smaller and smoother shaped but that might take away its authenticity and its classic Marshall design.

7) Function

Product A does do the job it was intended. It records what you play then you can replay and listen to it. It has loads of effects, It has pre programmed amp models so that the customer can play guitar as if using their favourite amplifier and you can plug in an mp3 player or CD player and jam along to your favourite tunes. Product A could be better if it had a built in speaker but you can listen to it through headphones or you can plug it in to your normal amplifier and use it as a bypass. Product B also does its intended job. You can amplify your guitar playing but not so loud that people get annoyed with you and you can strap this tiny amplifier to your belt so that it can be carried anywhere and played anywhere. Though I think product B would be a lot better if it contained more effects because this amplifier only has distorted and clean settings whereas product A has effects like chorus, delay, tremolo, reverb, flange and distortion and clean settings.

8) Material

Product A is mainly made from plastic and so is product B. It seems that plastic is the best material for these two products as any other material would make product A too expensive and it would take away the Marshal world known design. But unfortunately plastic isn't as good for the environment as some other materials.

Product B

Marshall MS2 Portable mini amp

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.

Mood boards will fail to gain marks unless suitably annotated.

Production methods

Continuous
The factory / production line will operate continuously day and night. In this way thousands of your product can be manufactured. All machines are arranged on the factory floor so that the product is passed from machine to machine.





Batch
Batch methods require that a group of items move through the production process together, a stage at a time. As batch sizes can vary from very small to extremely large quantities, batch production offers greater flexibility than other production systems.








The use of descriptive ‘theory’ inputs, as shown in these two examples, is discouraged and will gain no marks. The assessment criteria is looking for candidates to ‘apply’ their knowledge and understanding of the design influences to their own design activity.

Consumer Laws and Regulations

Standards are applied to many materials, products, methods and services. They help to make life simpler, and increase the reliability and the effectiveness of many goods and services we use. Standards are designed for voluntary use and do not impose any regulations. However, laws and regulations may refer to certain Standards making compliance with them compulsory.

When you see a product with the kite mark this means that BSI have independently tested it and has confirmed that the product conforms to the relevant British Standard.

Many products, such as New toys, must meet legal requirements before they can be sold within the European Community and must carry the CE mark. CE marking attached to a product is a manufacturers claim that it meets all the requirements of the European legislation.

This is an internationally recognisable symbol for recycling. The mark is put on many packages. It is to remind the consumer that what they are about to throw away is potential recycling property. Therefore it is aimed at helping to encourage more recycling other than throwing everything in a general rubbish bin.

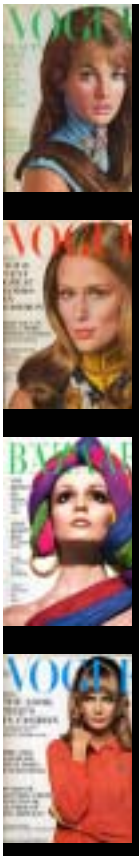
The Kite mark on products ensures the buyer that it is safe, reliable and meets the appropriate British Standards. My product will need to have the Kite mark. This is because these symbols are usually found on electronic products, it is to prove that my product is safe.

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.

N.B. Avoid using ACCESS FM and other similar acronyms at this level of study

This example of a specification was used in the June 2008 report to centres and requires some clarification. The specification has some excellent justification of some of the specification points given for example: No small parts as they are harmful and are harder to create / sew.

However the headings are a little misleading. A specification is a list of points that the product needs or should have to meet the design need. They are “necessary” points and will allow candidates a clear focus for their designing. Headings such as “might have” as used in this example and is not helpful to the candidate. In fact the majority of these specification points given by this candidate are valid and should, in reality, just be under a heading of “Specification Points i.e. the “must haves”.



Specification

Must have/be:

• Sensitive material, as children have softer skin. Instead of using elastine or lycra, perhaps use cotton for example.

• Not too short for running and wind etc – children run around and move lots, so you don’t want anything revealing underwear for example.

•Good sewing, so the garment doesn’t fall apart or rip easily. Children move about and fall over more than adults.

•Cheap – an adult does not want to buy an expensive garment that the child will just grow out of.

•Easy to manufacture – no small parts because they are harmful and harder to create/sew

Should have/be:

• Easy and strong fastening – children have trouble tying bows and doing hooks/eyes etc

•Machine washable, as no doubt something will be spilled/stained on it.

•Easy to iron

•Nothing too fancy such as bows and appliqué flowers that can rip off or be broken, lost or damaged.

•Many parents have more than one child, so they may want similar items for other children without directly matching them.

•Environmentally friendly to make, with no harmful chemicals or machines used

•Not made by child labouring countries

Might have/be:

•Not white – gets dirty easier and stains show up more.

•Might be zipped or have buttons, because as before children can’t do up anything tricky.

•Might be bright to appeal to children more and make them want to wear it.

•Pink and blue are a bit stereotypical, so you might want to steer away from that to get customers.

•Might come with specific shoes for the outfit

•Could be for a specific client e.g extra thin or wide

Internal Assessment Objective 3 (Maximum Marks 61)

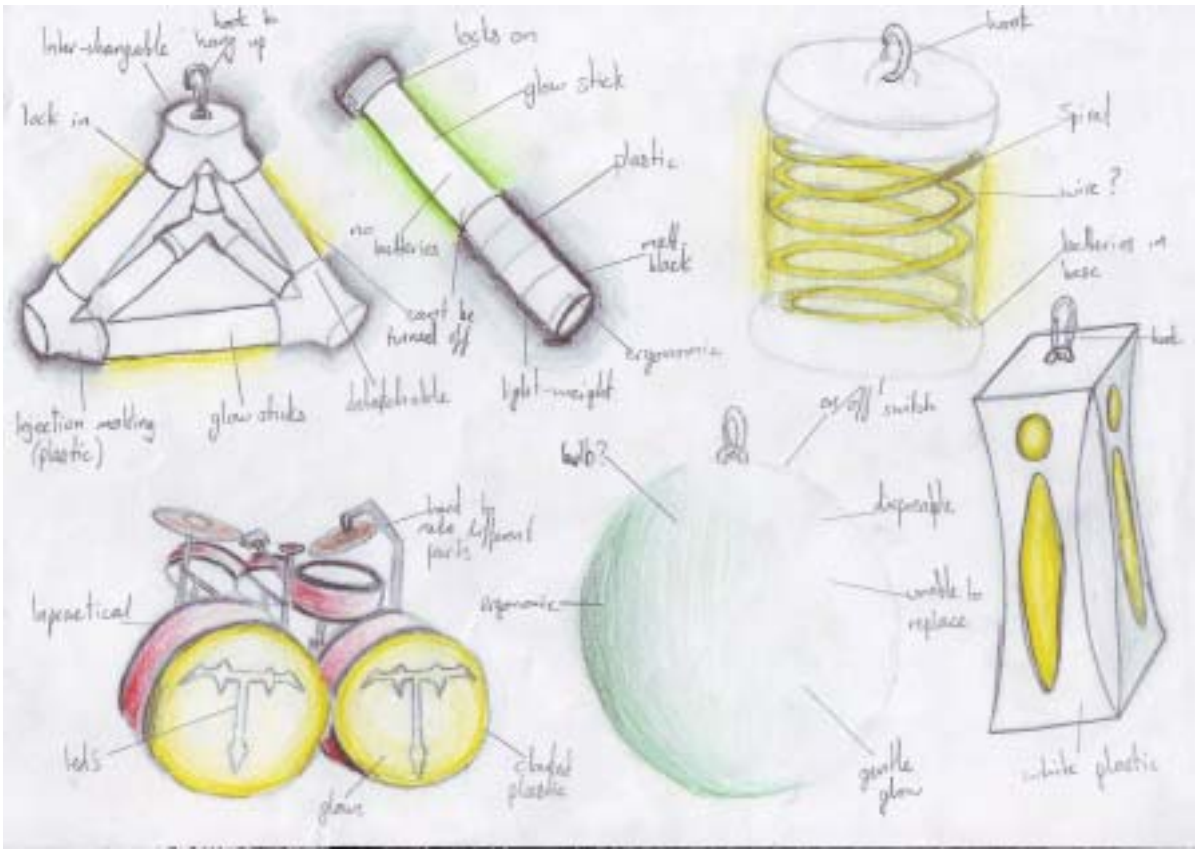
Candidates will need to:

- generate and record the development of design proposals that are innovative, show flair and imagination;
- consider user needs and issues when developing ideas;
- appraise design ideas for suitability, value and consequence;
- consider Aesthetics, Ergonomics and Function;
- 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; (1g)
- identify, with reasons for selection/rejection, the chosen design proposal(s) for prototype manufacture;
- check that the design proposal meets legislative standards. Consider patents and copyrights;
- have control on developing the product for manufacture, identify within the design proposals the resources needed for the prototype to be realised
- consider, using examples, those aspects of the design which could most easily be manufactured in quantity;
- produce a final product specification.(1e)

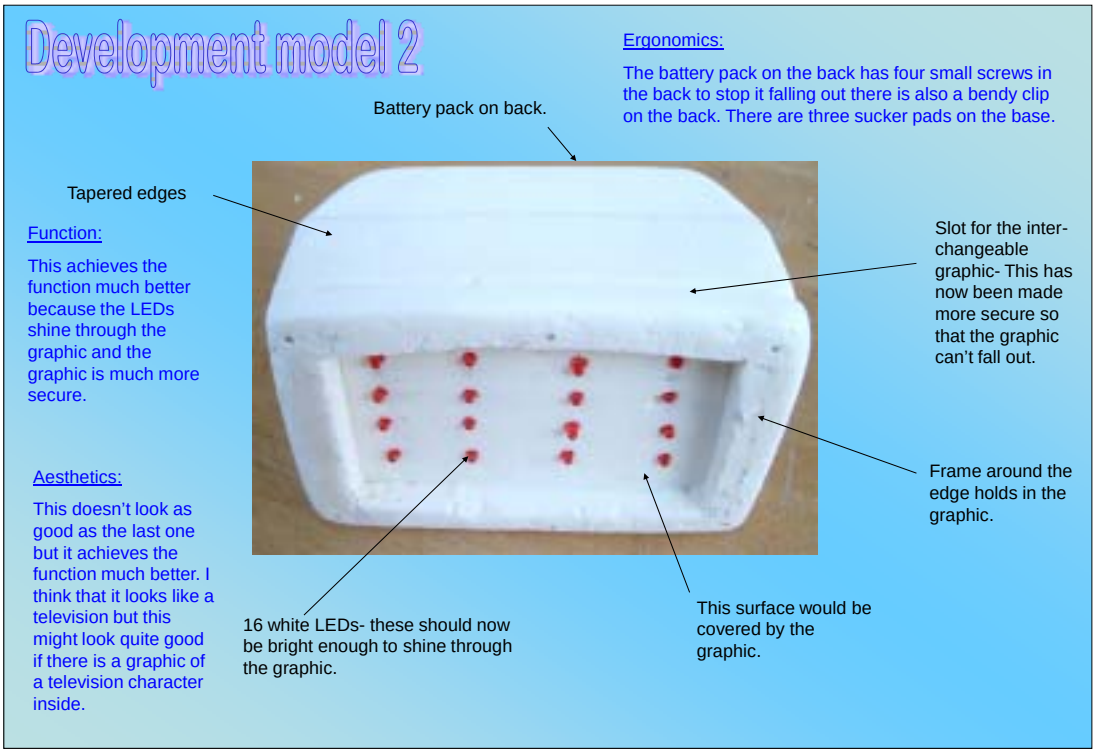
IAO3 has <u>five</u> separate sets of marks in five different strands. A summative approach is shown below:

1. **A range of ideas (with or without innovation and flair) showing developments 0-19 marks (20 - 25 where there is some "Wow" factor).**
2. **Technical content (the design influences, ergonomic, function and aesthetics considerations) 0-10 marks**
3. **Specification - use and consideration (best during but acceptable after the design activity) 0- 8**
4. **Communication skills including modelling 0-8**
5. **Use of CAD 0-10 used during the design work or 0-7 if retrospective. There are up to 3 marks available for quality word processing and basic ICT drawings.**

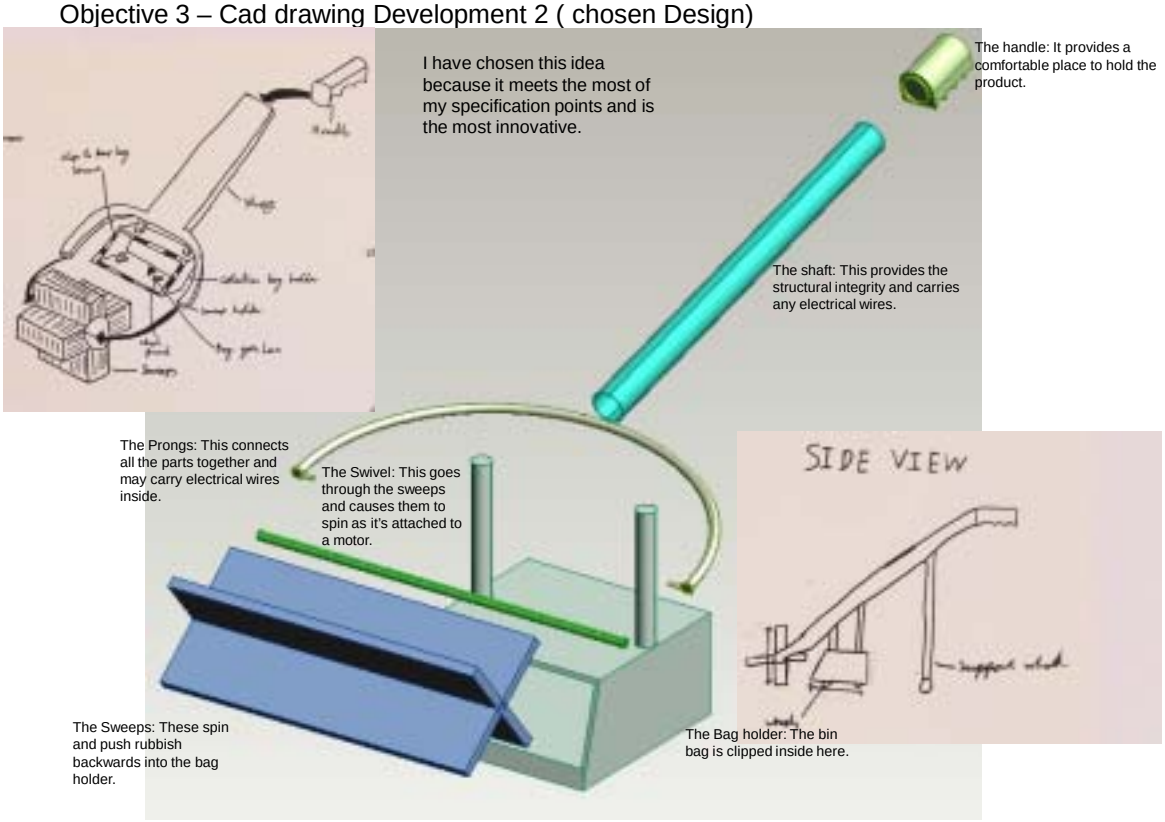
This initial set of sketches gains marks for the range of ideas and also shows confidence and clarity in communication. The fact that it generally uses labels rather than descriptive annotation is an area for development by the candidate.



Modelling is required to test the feasibility of ideas rather than modelling of a chosen solution. This example would allow some testing and developmental activity dependant on the outcomes of the testing.



Objective 3 – Cad drawing Development 2 (chosen Design)



CAD or OCA should be used as a design tool as shown in the example above and not just producing a drawing of the final solution.

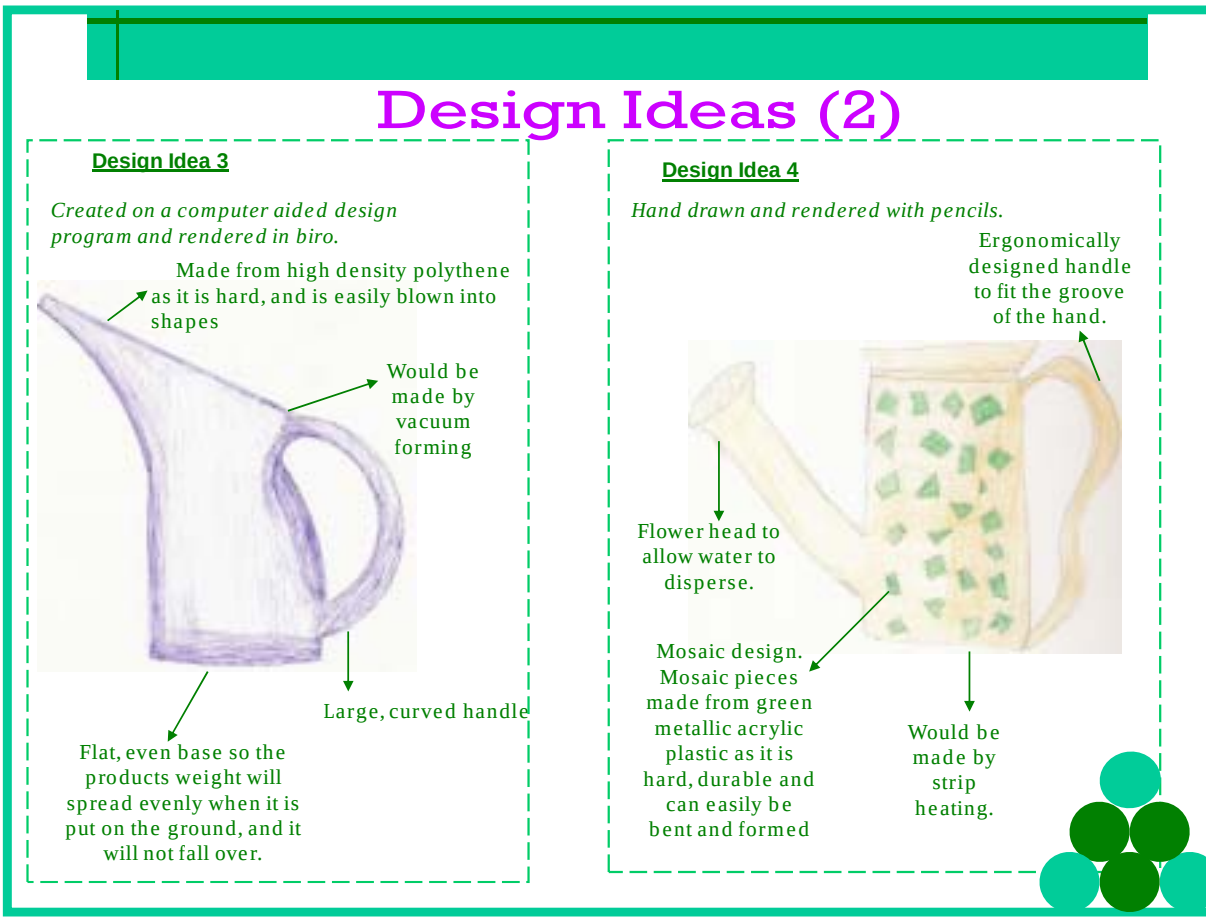
The ability to communicate well using a range of communication techniques is a fundamental design skill.

Candidates are required to select an idea for development which should be clearly compared to their design specification. Additionally during the ideas stage the specification should be constantly referred to.

- For some candidates a formal method may work for comparing against their specification as in this example from June 2008.

- Where candidate simply produce a grid and tick or cross ideas against specification points there is very limited value and will gain the lowest marks.

- Equally where candidates grade ideas against the specification against a 10 point scale i.e. 5/10, there is limited value unless there is genuine justification of the reasoning behind the judgement evidenced.



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

B802 Designing and Making Innovation Challenge

General Comments

Candidates have enjoyed the work they have carried out within the 'challenge' with many students reflecting positively on their experience. Candidates are not required to effect on this factor and should not be encouraged to do so, but it is heartening to note the positive nature of the 'unofficial' feedback received from them. It is pleasing to see students combining skills and knowledge of different material areas and using this to develop an optimum solution to the given design problems.

Administration

It is important that all examination papers are dispatched to the appointed examiner as soon as the innovation challenge activity has been completed. Centres should not retain scripts in the centre. Delays have again been caused during this session due to late dispatch of examination scripts.

Centres are reminded of the mandatory 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. This form should be submitted by either 1st January or 1st May. Copies of the form are available on the OCR website – www.ocr.org.uk.

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 some time prior to starting the challenge activity. Ensuring all materials have been received and are in place a week prior to the first challenge date is recommended.

Examination notices must be displayed in the area where the examination is to take place and an invigilator should be present.

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.
Teachers and other colleagues 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 OCR is assessing the individual student's designing and modelling capability.

Photographs

The majority of centres produce quality photographs to show the students work. However examiners have reported problems including photos being printed at a size to large for the allocated positions within the workbook, photos being printed at low resolution, photos being printed that are too small (approx postage stamp size) and photos not being attached to the students workbook.
The photos form an essential part of the assessment process. Photographs should 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 for fixing into their workbooks. 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. Candidate may attract marks for their detailed annotations but not solely for the inclusion of additional photos.
Candidates should be encouraged to stick photos into the workbook as they are printed. Care needs to be taken not to stick pages of the workbook together.

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.

Development of design. Evolution through making.

Initial Thoughts
Candidates used a mix of text and drawings to explore the given theme and identify possible design areas/problems. Some candidates failed to think creatively about the problem and suggested only predictable responses. Some candidates failed to consider the 'supplementary information' given within the challenge theme. Candidates need to be encouraged to take risks and think creatively.

Briefs
Briefs identified by candidates were often poorly written. Design Briefs were often too prescriptive. Many candidates confuse the design brief with the specification. Candidates should be encouraged to write clear and precise but 'open' 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.

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. Candidates 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 section one of the challenge activity and disregarded both the design brief and specification.
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 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. A number of candidates have failed to respond to the supplementary information given. Examiners have reported that in some cases candidates have actually responded to supplementary information from previous years examination papers for which no rewards can be 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 and accessing the marks available.

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. 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.

Materials, Components, Processes, Techniques and Industrial Practice

Examiners have noted an increase in the use of sheet materials such as MDF and Plywood for modelling. These materials often limit the student's ability to model designs appropriately and/or impact upon the students design work. Where these materials were used, the candidates' work was often incomplete because candidates were trying to manufacture 'final outcomes' rather than a 'prototype product'.

Centres are reminded that candidates should undertake prototype modelling of their design using appropriate modelling materials such as foam, foam board, card, balsa, modelling clay, mechanism kits, polymorph etc. It is essential that during the course students regularly undertake modelling activity in order to develop their manufacturing skills and knowledge of modelling materials and techniques.

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 has improved however some candidates failed to develop their ideas and simply copied the design from the ideas section (box 5) into the development section (box 8) or produced a card model of their initial idea which was then stuck into box 8 with no further development taking place. 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.

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
This section was often poorly completed by students. It is essential that students use the 30 minutes available to read through their workbook and reflect upon the activity they undertook. Where design alterations are proposed these should be drawn and clearly communicated. Cursory written comments will not attract high marks.

Candidates should be reflecting on the strengths and weaknesses of their prototype design and not on their own performance.

High achieving students clearly identified strengths and weaknesses within the design of the prototype product and suggested alterations and improvements to the design. These alterations were shown through the use of text and drawing.

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.

Centres cannot use the same images for different candidates; it has to be clear to the moderators what the work of an individual student is.

It is important that video and sound is packaged properly in the presentation, so all evidence of work is presented when it comes to moderation.

Centres who are unsure about the delivery and content should attend appropriate training as the requirements of this specification is very different from others currently available. Misinterpreting the criteria is detrimental to candidate's progress.

It is imperative that centres who are entering candidates from a wide variety of material areas invest time in assessing and internally standardising the candidates work as a centre. All products must justify the time and quality required to achieve the GCSE standard. The procedure ensures that the rank order of candidates is correct and this greatly assists the moderator throughout the moderation process. It also minimises the opportunity for some candidates being allocated the wrong mark if the centre's marks are adjusted.

Teachers are required to authenticate that the work is that of the candidate. Where evidence is e-portfolio based this is particularly important. Form CCS160 must be supplied in the sample selected for moderation, signed by all staff teaching the specification.

Individual Candidates are free to present the work in any appropriate medium, both on paper format or in electronic format on CD, but not a combination of the two. Currently CD has worked best for the marketing presentation as it allows a broader variety of media to be used to create a 'Sales Pitch' or advertising campaign.

Candidates work should be bound together or contained separately in some way. Work which is left loose and getting mixed up when posted is unacceptable.

CAM is to be encouraged where facilities are available; however, centres need to be reminded that candidates are to combine a range of skills and techniques when constructing their final outcome. **Candidates that purely use CAM to make their products cannot achieve the highest marks threshold in any area of objective 4.**

Centres must try to ensure prompt response to examination paperwork and the forwarding of moderation samples to moderators. An appropriate postal tracking option is best in the case of work going missing.

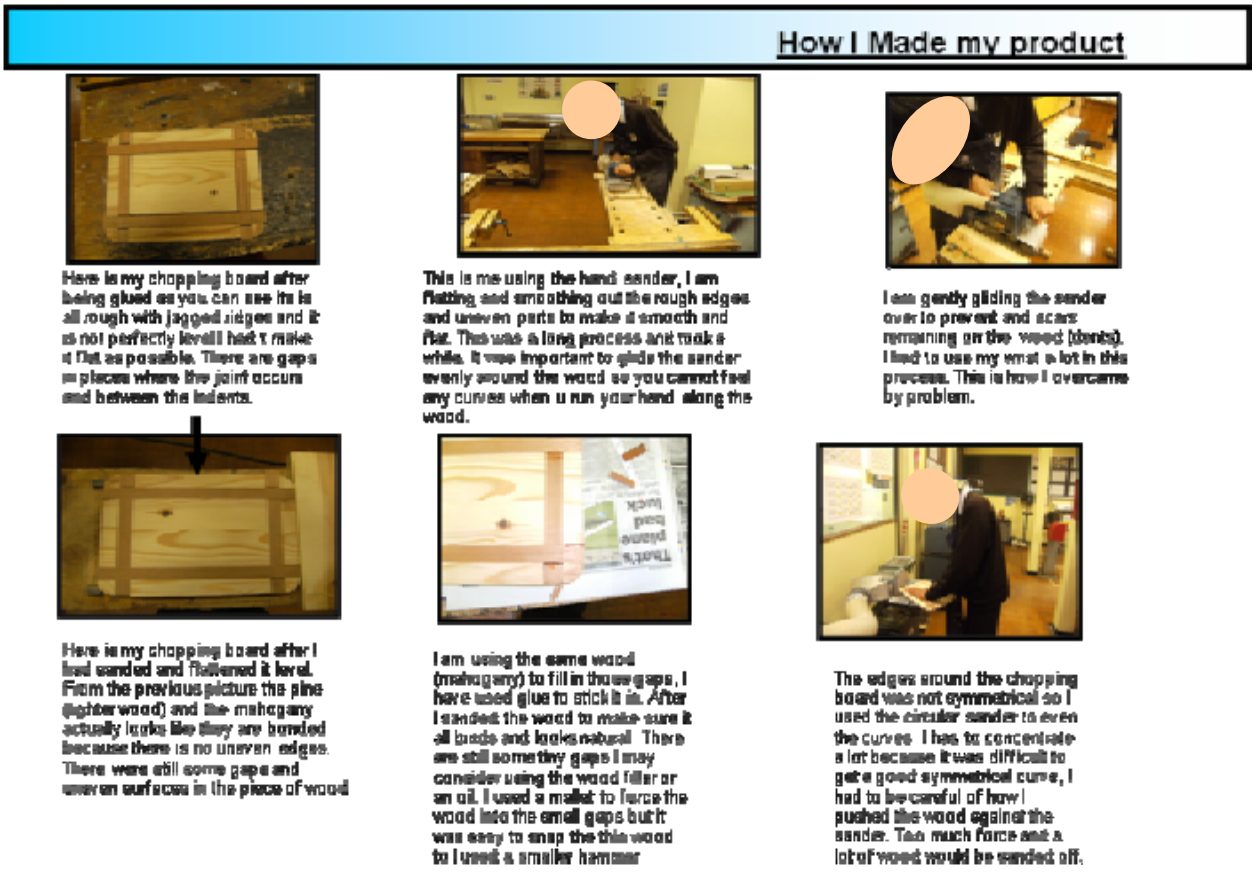
Objective 4

The range of products manufactured varied considerably in size and complexity. Centres should be reminded that the unit is 20 hours and the type of product manufactured should reflect this. Some centres allowed the candidates to produce far too complex products. Other centres allowed the whole of their candidates to produce products which would clearly take significantly less than 20 hours.

This unit is simply about creating a singular functioning quality product.

Modelling is not acceptable in this unit.

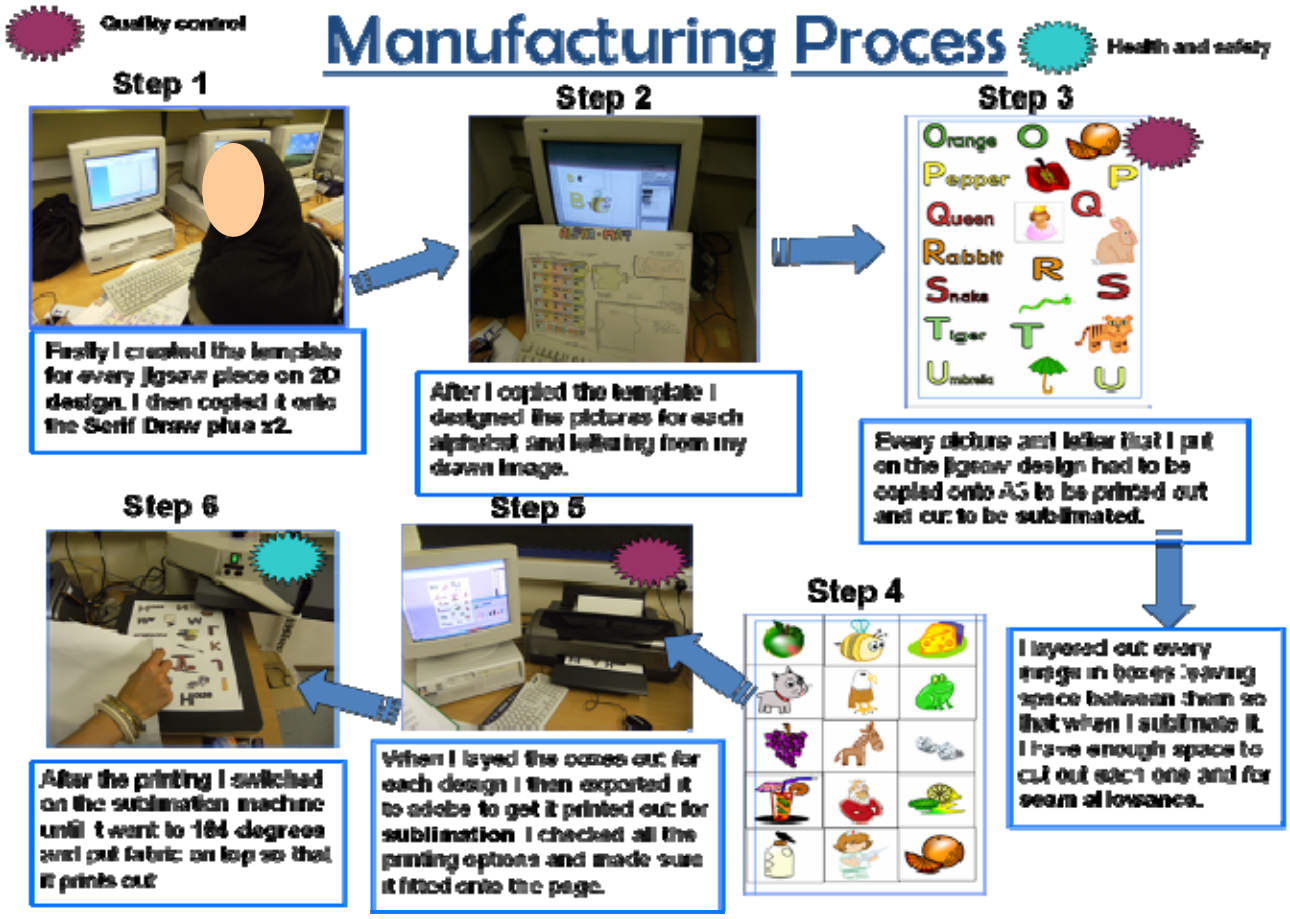
The recording of the manufacture was generally well done with centres encouraging pupils to record their progress in real time. Weaker centres either produced only a written time plan or a limited number of photographs which did not outline the candidates understanding of their manufacture.



Above shows part of an excellent example of how to show ownership and understanding of the manufacturing process. Tools and techniques are explained and where necessary health and safety implication are expressed clearly.

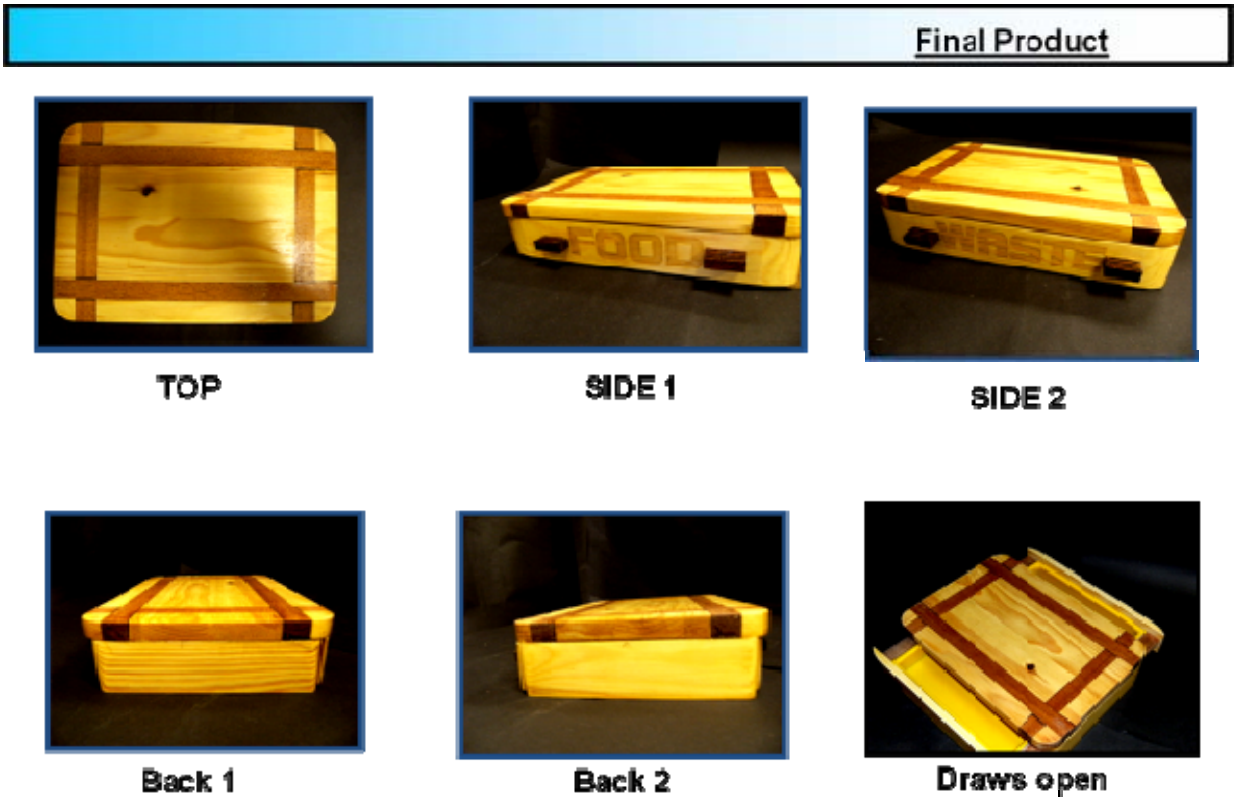
A "plan of Making" is not required for this specification and will gain no marks. It may well be advantageous to assist the candidates with their manufacture but this specification requires a "production log" or diary. with annotations, of the important stages of manufacture.

For postal moderation proof of it being the candidates own work is essential for success.



The use of CAD/CAM is to be encouraged; however it is seen as one skill, so centres must ensure candidates have a range of skills in producing the practical work to achieve the higher marks. Above shown an excellent example of CAD/CAM that shows clear understanding of the processes and techniques used

Marking of the final product was generally accurate. The main alterations to marks in this section was due to poor recording of the manufacturing process and limited or poor quality images of the final product.



Images of the product should show a range of views and information to demonstrate the quality of the candidates work.

It helps if centres provide some idea of scale in at least one photograph; placing a ruler or familiar object alongside the finished product.

If there is no evidence of a completed and finished product the candidate can only achieve the lowest threshold mark for this section, 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, not recapping on anything that has happened in the construction stage.

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 reference to the specification and realistic user testing. The only alteration to marks in this section was for centres who only evaluated against the specification but awarded marks in the top band.

Below is a good example that shows clear user group feedback, images, video and audio are used to test the product. Candidates should be encouraged to explore different ways of presenting their findings. Video is clearly highlighted that it is included in the presentation.

Modifications are still only being written with very few centres allowing students to sketch their possible changes.

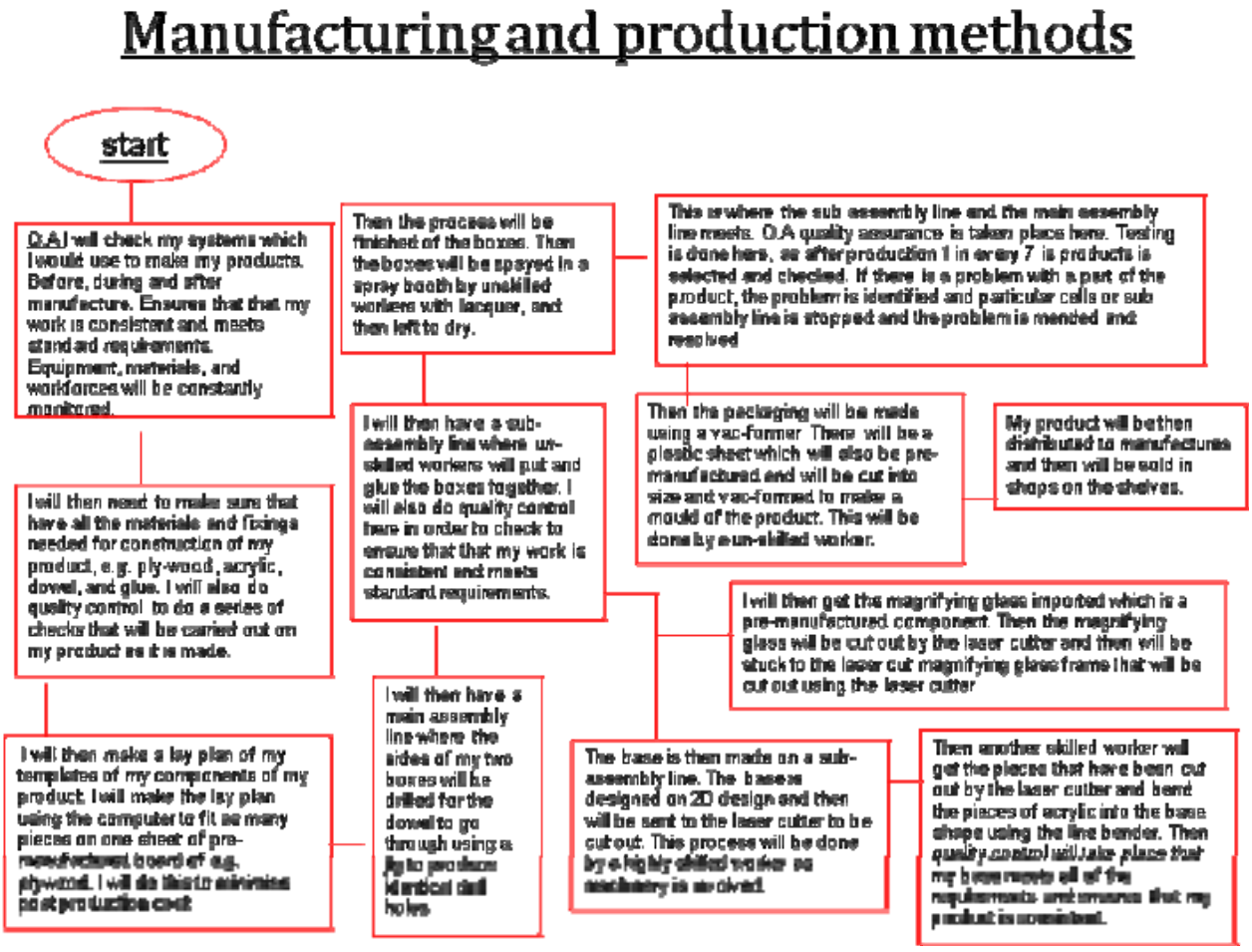
Modifications that took place in the making process are not awarded marks in this section; this would be awarded in objective 4.

Candidates should suggest, in detail, appropriate design modifications to improve the finished manufactured prototype. This should be seen as a design exercise and is an opportunity for candidates to show how their finished product could be improved or modified. Candidates should show these as sketches or perhaps alterations made to photographs. This is an exercise that can be clearly practiced as any product can be improved upon with a little imagination. Candidates may wish to alter or draw on original images of the finished product or use overlays in an innovative design way.

Generally this section was attempted poorly, with most candidates making reference to the construction stages, rather that thinking specifically about how the finished product could be improved. Remember this is a design subject and sketches/images/CAD etc., with clear and detailed annotation is the way this assessment point should be addressed.

Quantity production continues to be a very weak area. Centres are not informing pupils of how products might be manufactured in quantity. Candidate responses tend to be very generic based on theory notes or cut and paste information from the internet. Appropriate research would need to be carried out to find out how a similar product would be manufactured in a 'Real World' situation.

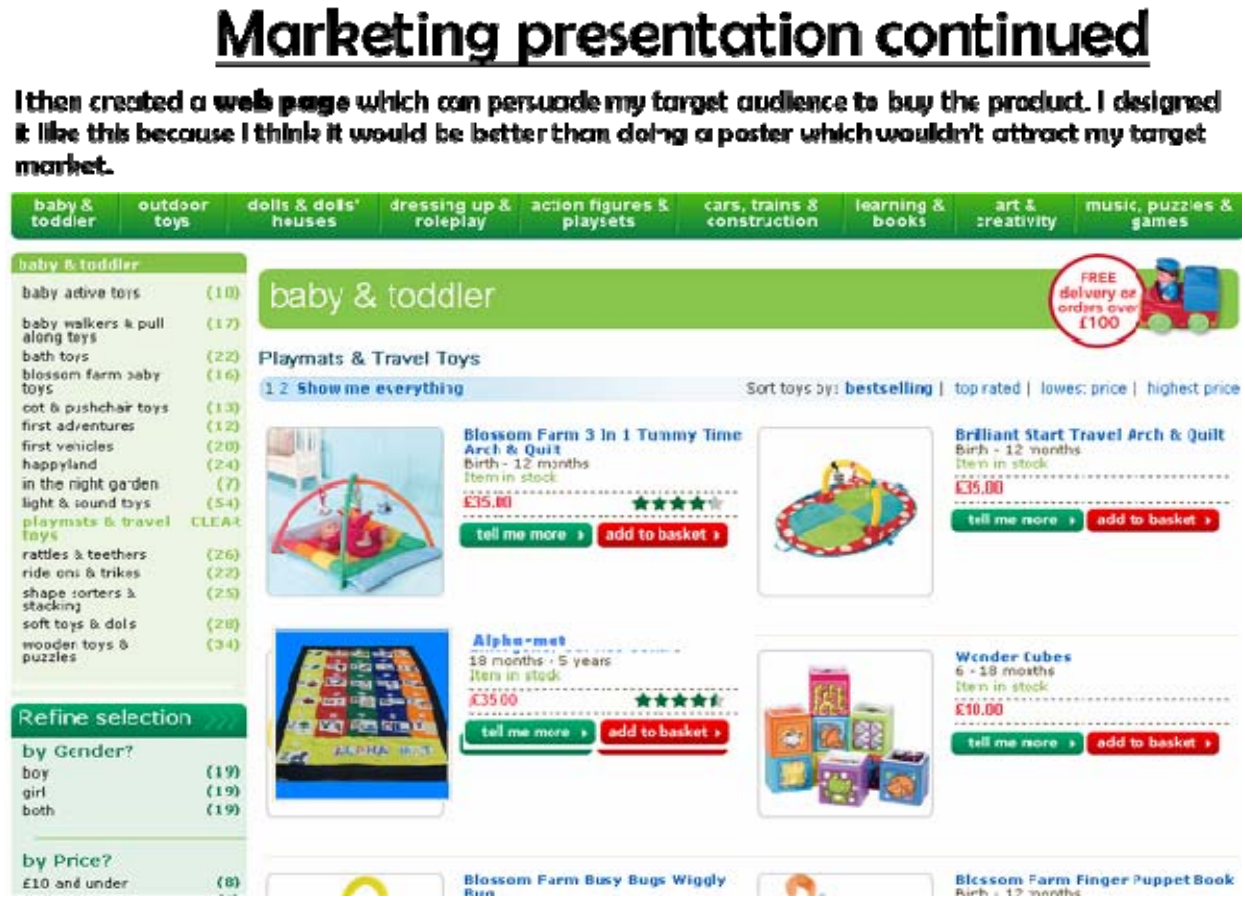
Below is an example of a slide from a students' portfolio that is progressing in the right direction.



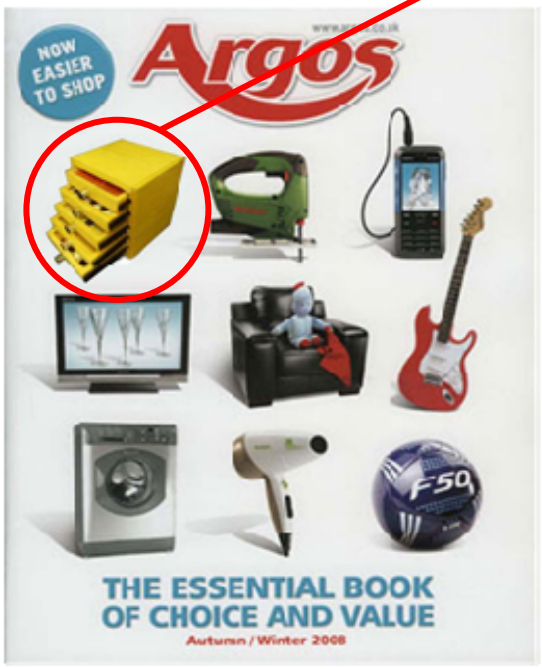
The marketing presentation section has significantly improved with centres now approaching this in a far more innovative way. High performing candidates produced videos or placed their product in a promotional context. Weaker candidates produced poor quality posters. Packaging of the product only, is not sufficient to gain full marks in this section.

The marketing presentation is an opportunity for the candidates to promote their ideas through an innovative presentation to a prospective manufacturer, supplier, buyer or retailer of the product.

Good examples seen include 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 must be realistic and professional in appearance and an explanation for the idea of the marketing strategy.



Student's project inserted in a realistic and professional way



It is a shame some of the interesting and humorous video adverts cannot be shown in this document.

B804 Designing Influences

General comments

Overall, the candidates performed well. Particularly pleasing is the candidates' understanding of the wider influences on design. Students for example, appear to have a much better understanding of issues such as the globalisation of design and manufacturing and its impact. Once again, centres have clearly prepared their students' well. This is evident from the responses to question 4, which showed a greater depth of knowledge about the specific designer or design icon. As with previous examination sessions, candidates' performed least well on question 5a and 5 d. It is here where candidates need to draw upon and then apply their knowledge and understanding to the specific design situation. Too often, candidates give generic responses which in themselves demonstrate little more than a superficial understanding of the problem. Frequently, students used memory tools and acronyms to remember specification points such as café cues; whilst this is itself is a useful starting point, without applying the particular point (say ergonomics) to the specific design context, it will gain very few marks. 5a is at its heart a question which challenges candidates to analyse a context, evaluate the key issues and then write a succinct point. It is not a mere recall question.

Question 1

(a) Give **three** important features of denim jeans.
Candidates were well able to identify physical features of the jeans such as *pockets, zip* and *belt loops*, as well as user features such as *comfortable, fashionable* and *washable.*

(b) Denim jeans are often designed with fashion in mind. Give **two** reasons why fashion is important when designing.
Candidates had to be careful to give answers that were sufficiently different in order to merit two marks. Answers such as *'If it is in fashion then people will buy it'* and *'If it is not in fashion it will not sell'* could only attract the award of 1 mark. However, answers such as *'People want to be noticed and seen to be in fashion'* and *'Jeans that are in fashion will be in demand more than others'* did attract the award of 2 marks.

(c) Describe **one** test that could be carried out on a prototype pair of denim jeans before manufacturing the jeans in quantity.
In order to qualify for the award of both available marks, answers had to name or describe the nature of the test for the first mark and then explain what was being tested for the second mark. For example, '*Wash the jeans a number of times* (1 mark), *to find out if the colour fades* (1 mark).

(d) The cost of some denim jeans has remained relatively low. Explain why this has happened.
This question was well attempted with answers that provided a number of creditable points concerning *globalisation, mass production, high street competition* and *current market demands*, together with explanations, justifications, consequences or additional detail.

Question 2

(a) Give **four** design features of roller skates.
Many answers scored the full 4 available marks by giving either the physical features of the skates such as *wheels, laces, brakes* and *cushioned ankle supports*, or by giving user features such as *comfortable, fashionable,* and *hardwearing*.

(b) Explain the purpose of the bearings.
The purpose of bearings was not well known.
Some answers related to directional bearings as in navigation, with such responses as *turn left or right easily to where you want to go*.
Other answers referred to the security of the wheels.
However, a small number of answers did score the 3 available marks with responses referring to *the reduction in friction* (1 mark) *that allows the wheels to spin more freely* (1 mark)*, taking the skater further, on a smoother ride (1 mark).*

(c) Describe, giving **two** examples, how designers of roller skates use anthropometric data.
Knowledge of anthropometric data was not well known.
Answers referred to the style of the skate, the balance of the user, and the function.
A small number of answers referred to buying trends among the public and the measurement of public taste.
Anthropometrics is one of the most important design influences within the whole subject of Product Design.
Candidates must be encouraged to develop an understanding that anthropometric data is the measurement of specific parts of the human body, used in
Product Design to ensure the most suitable sizes and most appropriate positioning of features for comfort and ease of use.

Question 3

(a) Complete the diagram by adding a further **three** successful features of a fruit smoothie.
Marks were awarded for the identification of specific features of a smoothie such as *natural sugars, vitamins, no chemical additives,* and *easier than eating fruit.* A number of answers gave extensive detailed explanations, in a form more appropriate to that required in 3(b).

No credit was given to answers referring to features of the smoothie bottle. Frequently, answers referred to '*healthy*' and to '*fruit*', but these were given in the question.

(b) Explain why **two** of the features you have identified have made the fruit smoothie successful.
There were some well presented explanations about the successful features of the fruit smoothie.
For example, *being a drink it can be a more convenient way to consume fruit without having to remove peel or dispose of stones.the natural sugars in a fruit smoothie have a slow release rate, so less likely to give a 'sugar rush' and the subsequent 'energy loss'.*
Where answers in 3(a) had identified successful features of the smoothie bottle and been awarded no marks, providing the explanations in 3(b) were relevant and appropriate, full marks were possible.

(c) Explain why most fizzy drinks are no longer considered suitable to be sold in schools.
The answers to this question were often detailed and well informed relating to *the sugar and the additives in the fizzy drink that posed a health risk to school children in terms of teeth, bones and obesity, as well as the risk of hyperactivity, bad behavior, withdrawal and lack of concentration in lessons.*

Question 4

(a) Trend setter chosen .....
Explain the importance of this **trendsetter**.
The answers to this part of Q4 were generally comprehensive, with **specific details** of what the trend setter had done, together with an explanation of the **importance** of these innovations.
In the case of Brunel, for example it was his railways*, bridges and tunnels that improved the whole transport system of Victorian Britain, and that many features of the system are still in existence, still used, included in modern developments, and copied by other countries.*
No marks were awarded in this first part of Q4 for details of the iconic products required in 4(b).

(b) Iconic product chosen .....
Discuss why the **product** you have chosen has been so influential. Make specific reference to innovation and function.
Answers to this question need to identify a range of features of the iconic product, describe their function, then explain their innovation and possible legacy.
In the case of the SS Great Britain, for example, *it was the first iron hull with the first screw propeller, in a steam driven ship. It was the largest of its time and it could travel further and faster with more passengers and more cargo.*
Iron had never been used before and many thought the ship would sink.
New techniques had to be developed for joining the iron and making the joints watertight.
All of these developments changed the way liners and ships were made.

Generalised statements attract little credit: answers must contain **details** and **examples** in order to qualify for the higher marks.

Question 5

(a) Identify **four** important specification points for your chosen design situation.
The required specification points should be **positive** statements (avoid 'not too big', 'no sharp edges', 'not too heavy') about the **form**, the **function**, the **user requirements** or the **constraints** of the situation.
A majority of answers to this question attract **few** marks because most of the specification points are taken from information already given in the question stem or in the Design Situation.
Typically, for the souvenir bottle opener, specification points were given as, *it must open bottles, it must relate to Brunel, it must celebrate one of his memorable works, and it must be old-fashioned Victorian style.*
All of these aspects are already covered within the question paper and would score **no** marks.
Examples of creditable specification points would be, *the handle size and shape must fit comfortably into the average size hand, the material used must not rust or corrode, the bottle opener must fit easily into a pocket or a handbag, it must be stiff and rigid enough to withstand the forces required to remove the bottle tops.*

Clearly, the wording of the specification points needs careful consideration in order to score the marks available.
This may be an appropriate area for candidates to practice in preparation for the examination.

(b) Use sketches and notes to show your initial ideas.
In order to score well in this question, the answer must show, firstly, a **range of different ideas**, secondly, **notes** (not just labels) that describe, explain or justify particular features of each idea, and draw attention to the way in which the feature is **addressing** one or more of **the specification points** from5(a).
A majority of answers tend to score 3 or 4 of the available marks for this question.

(c) Use sketches and notes to develop **one** of your initial ideas.
In this question, a majority of the answers only score 2 of the available marks.
In order to score high marks in this question, the page must show:

- A sequence of **sketches** illustrating the developmental **stages** towards the final solution that satisfies the **specification points** in 5(a).
- Design ideas that clearly address the **need** as given in the Design Situation.
- **Notes**, not labels, that clearly identify the links with the **specification points**.

Where the specification points in 5(a) attract the award of no marks, then a maximum of only 2 marks can be awarded in this question.
Where there is no evidence of developmental work, then a maximum of only 2 marks can be awarded.
Should the design idea fail to address the given need then a maximum of only 1 mark can be awarded.

Perhaps this question may be an appropriate area for practice in preparation for the examination.

(d) Give details of your final proposal showing **how** it meets the four specification points you identified in part **(a)** of this question.
In order to score high marks in this question the page must show:

- A sketch or sketches of the final solution showing sizes/dimensions/quantities, materials/ingredients/components and details of tools/equipment for making.
- Notes, and/or sketches showing and explaining **how** the design meets each of the four specification points.

The key word in the preceding statement is '**how**'.
To attract marks, the statements must explain, for example, **how** the design will fit comfortably into the average size hand, and **how** the design will fit easily into a pocket or handbag, and **how** the material will not rust or corrode, and **how** the design will remain stiff and rigid during use.

No credit can be awarded to generalised statements such as '*my design meets spec point 2 because it will fit into an average hand*', or '*my design*

Grade Thresholds

GCSE Product Design (Specification Code J900/901)
January 2009 Examination Series

Unit Threshold Marks

Unit		Maximum Mark	a*	a	b	c	d	e	f	g	u
B801	Raw	90	83	69	55	41	35	29	24	19	0
	UMS	120	108	96	84	72	60	48	36	24	0
B802	Raw	60	49	44	39	34	29	25	21	17	0
	UMS	80	72	64	56	48	40	32	24	16	0
B803	Raw	90	76	64	52	41	34	27	21	15	0
	UMS	120	108	96	84	72	60	48	36	24	0
B804	Raw	60	44	38	32	27	23	19	15	11	0
	UMS	80	72	64	56	48	40	32	24	16	0

Specification Aggregation Results

Overall threshold marks in UMS (i.e. after conversion of raw marks to uniform marks)

	Maximum Mark	A*	A	B	C	D	E	F	G	U
J900	200	180	160	140	120	100	80	60	40	0

	Maximum Mark	A*	A	B	C	D	E	F	G	U
J901	400	360	320	280	240	200	160	120	80	0

The cumulative percentage of candidates awarded each grade was as follows:

	A*	A	B	C	D	E	F	G	U	Total No. of Cands
J900	0	2.2	20	60	68.9	75.6	86.7	88.9	100	48
J901	0	16.7	33.3	83.3	100	100	100	100	100	6

Statistics are correct at the time of publication

OCR (Oxford Cambridge and RSA Examinations)
1 Hills Road
Cambridge
CB1 2EU

OCR Customer Contact Centre

14 – 19 Qualifications (General)
Telephone: 01223 553998
Facsimile: 01223 552627
Email: general.qualifications@ocr.org.uk

www.ocr.org.uk

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored

Oxford Cambridge and RSA Examinations
is a Company Limited by Guarantee
Registered in England
Registered Office; 1 Hills Road, Cambridge, CB1 2EU
Registered Company Number: 3484466
OCR is an exempt Charity

OCR (Oxford Cambridge and RSA Examinations)
Head office
Telephone: 01223 552552
Facsimile: 01223 552553