DESIGN AND TECHNOLOGY

Paper 9705/02
Project 1

Key messages

- Candidates are advised to address all aspects of the Analysis of and Research into the Design Brief which results in a Specification. Outcomes often resulted in an imbalance between the different aspects with too much time given to the presentation of existing ideas together with 'textbook' information on materials, production methods, finishes and even tools. This was too often at the cost of meaningful examination of the intended use of the product resulting in the collection and presentation of appropriate data.
- It is important that candidates select the most appropriate material for the modelling of ideas at the end of Project 1. The model should then be produced to a high standard with attention to detail so that all aspects of the proposed design can be included and subsequently considered for further development.

General comments

Many candidates clearly became very involved in their Design and Technology project work, identifying design problems that were close to their own needs and producing outcomes that were of use to themselves or others. There are certain advantages to this approach as the whole design process then becomes more meaningful to the candidate concerned. Another successful approach is to focus on a particular theme, such as life in their homes or leisure time with friends, with candidates then being required to identify a design need or situation from within the theme.

Many interesting design problems were considered with successful and useful outcomes of either models, prototypes or final products. Examples of these outcomes included: rubbish compacter, thrift shop, dog's kennel, TV stand, onion planter, school bus shelter, gaming café, maternity room, garden bird shelter, go kart, washing-up drainer, bottle holder, head rest for reading in bed, travel coffee mug, carry-on bag, valuables storage, bed base, floating hide, make-up tool holder, fishing rod storage, mobile phone storage, folding dining table, space saving furniture, solar powered phone charger, shopping trolley, safe medical tablet storage, rubbish bin, folding shelf unit, skateboard storage stand, artist's easel, solar water heater, jewellery holder, portable vendor stand, basketball rack, bunk bed, bird nesting box, bicycle storage, workout bench. Most of these were final full-size products but in other cases architectural models were produced.

Centres continue to present work for moderation clearly labelled on the outside of the design folder and with all documentation complete.

Comments on Individual Assessment Criteria

Question 1

Identification of a need or opportunity leading to a design brief

It is important for the reader of a design folder to be able to identify the nature of the design situation as close as possible to the beginning of the document. This introductory section of the folder identifies the precise design problem and subsequent design brief.

Most candidates were aware of the need to include a detailed description of the need and to identify the intended user(s).

Question 2

Analysis of and research into the design brief which results in a specification

Most candidates did carry out some form of analysis of the topic being considered but this was not always a clear analysis of the design brief. Candidates need to consider all aspects of the use and purpose of the product that will satisfy the design need so that relevant data and information can be collected for use in the generation of a specification and design ideas. Most candidates considered existing products that might meet the need and identified some good and poor features of each.

Specifications were generally well written and many candidates realised that generic points are of little help when using the specification to evaluate an idea or product at a later stage in the design process.

Question 3

Generation and appraisal of design ideas

Candidates offered a wide range of ideas. There was a high standard of communication techniques used in the presentation of design proposals. Where care is taken in this respect then it is easy to see how a candidate's thought process has developed.

It is important that different ideas are annotated with comments linked to the design specification so that all important aspects of the need are considered. Successful candidates recorded all ideas that came to them however practical or appropriate they appeared to be at this stage of the design process. These were then appraised in an ongoing fashion so that other ideas could develop and be drawn together to form the final design solution.

Question 4

Modelling of ideas

Modelling has a clear purpose in any design process and it is important that candidates give due care and attention to the quality of construction. Although materials used tend to be semi-resistant in nature there is no reason why high standards of manufacture should not be possible. Only when this has been achieved can high marks be awarded.

Where candidates know from the beginning of the project that, for example, an architectural model is to form the final product then this should be stated in the specification so that meaningful evaluation, relating to the model, can be carried out later.

DESIGN AND TECHNOLOGY

Paper 9705/04
Project 2

Key Messages

- The realisation of the developed design idea is a key part of Project 2 and it is clear that many candidates take considerable pride in the production of their final product. It is important that photographic evidence of this product is included in the design folder so that all detail can be viewed.
- The Testing and Evaluation of the final product should start with evidence of meaningful practical testing in the intended environment. Results from this testing should then be compared to the original specification so that judgement can be made leading to subsequent suggestions for modification or further development as appropriate.

General comments

Many candidates clearly became very involved in their Design and Technology project work, identifying design problems that were close to their own needs and producing outcomes that were of use to themselves or others. There are certain advantages to this approach as the whole design process then becomes more meaningful to the candidate concerned. Another successful approach is to focus on a particular theme, such as life in their homes or leisure time with friends, with candidates then being required to identify a design need or situation from within the theme.

Many interesting design problems were considered with successful and useful outcomes of either models, prototypes or final products. Examples of these outcomes included: rubbish compacter, thrift shop, dog's kennel, TV stand, onion planter, school bus shelter, gaming café, maternity room, garden bird shelter, go kart, washing-up drainer, bottle holder, head rest for reading in bed, travel coffee mug, carry-on bag, valuables storage, bed base, floating hide, make-up tool holder, fishing rod storage, mobile phone storage, folding dining table, space saving furniture, solar powered phone charger, shopping trolley, safe medical tablet storage, rubbish bin, folding shelf unit, skateboard storage stand, artist's easel, solar water heater, jewellery holder, portable vendor stand, basketball rack, bunk bed, bird nesting box, bicycle storage, workout bench. Most of these were final full-size products but in other cases architectural models were produced.

Centres continue to present work for moderation clearly labelled on the outside of the design folder and with all documentation complete.

Comments on Individual Assessment Criteria

Question 5

Product development

Successful candidates included much drawn and written information in this section of their design folders so that the reader could see details of the intended product and how it would be assembled and finished. This usually included details of all materials, form and constructions, as required by the nature of the chosen design idea. Some candidates needed to provide more evidence to indicate why these materials and methods had been chosen and how others were considered before making the final choice.

Candidates who had achieved high marks also showed how they had carried out some form of trialling or testing in some of these areas. For example, successful candidates showed how they had tested materials or trialled alternative construction methods before finalising their choices. Where the project followed on from Project 1 then testing of the model often proved useful.

Question 6

Product planning

Many candidates fulfilled successfully this requirement of their design work, giving a sensible overall plan of the intended stages of manufacture together with clear working drawings of the product and a list of all materials and components to be used.

Question 7

Product realisation

The made product forms the culmination and realisation of many hours of detailed design work for most candidates. It could be seen that many candidates had given much care to this stage of their project. Many candidates had developed fairly advanced making skills whether this was through the use of resistant materials, graphics or other media. It was clear that most products were constructed and finished to the required standard for use.

It was helpful where candidates had included not only detailed and clear photographic evidence of the final realisation, as required by the syllabus, but also of the product in use.

Question 8

Testing and evaluation

There has been a continuing improvement in this section of design folders as more candidates carry out meaningful testing and evaluation, showing evidence of this taking place. This can only be completed successfully and in a meaningful way if the results of the testing are then compared to the original design specification.

In some instances, candidates needed to further improve when carrying out their testing and evaluation because they had produced a list of the specification points and then completed a tick box alongside when it was felt that a particular requirement had been met. This simplistic approach is insufficient for the award of high marks and candidates should be encouraged to evaluate critically with reasons given and evidence to support their judgements.

DESIGN AND TECHNOLOGY

Paper 9705/11
Written 11

Key messages

To do well, it is vital that candidates cover the full content of the specification.

In ***Section B*** part **(d)** analysis questions, candidates did not always identify the key phrases/requirements of the question or include relevant examples to evidence their understanding or extend their answers to justify full understanding of a relevant point.

General comments

Sections A and ***B*** were generally accessible to candidates who had prepared well. Process knowledge was reasonable with all three questions in ***Section A*** being attempted with some understanding of basic knowledge. Occasionally health and safety points that candidates added were irrelevant to the process and were sometimes generic.

Candidates generally found the three questions in ***Section C*** accessible with some good answers seen. However, candidates should be reminded that the terms 'develop' and 'range' mean that they should give several different ideas, which they then evaluate to allow further development into a final proposal for each part of the question. The development of a range of ideas was often not evident.

Components, mechanisms, and construction techniques are particularly helpful. Having a coherent layout of page with designated areas for a range of designs, evaluation, and development helped candidates to focus their attention and time. Evaluation of initial ideas was often limited in detail and sometimes did not include any of the aspects that were very clearly required for the question.

Comments on specific questions

Section A

Question 1

(a) Generally, this was answered well and most candidates could give at least one reason why stainless steel was suitable.

(b) (i) Stronger answers detailed marking out, cutting out and folding of the top. Most candidates used technical terms for the tools and equipment used. Safety precautions were not always included. However, some candidates gave die casting as a process, which was incorrect.

(ii) Generally, this question was quite well answered with candidates understanding the steps necessary to mark out and machine the body. Those candidates who understood the use of the wood lathe scored well.

(c) Candidates found it challenging to show how to produce 5000 nylon stoppers. Stronger candidates had a good understanding of injection moulding.

Question 2

(a) Most candidates were able to correctly explain how the foamboard discs could be secured and made able to rotate.

(b) (i) This question was often answered well with candidates understanding how to mark out and cut out the front disc. CAD/CAM was occasionally used to good effect. Technical terms for the tools and equipment used was often limited.

(ii) Candidates had a reasonable understanding of how to make and apply the self-adhesive vinyl characters including the use of tools and equipment as well as CAD/CAM. Safety precautions were often omitted.

(iii) Candidates gave a wide variety of answers to this question. Stronger answers included marking out, cutting out and then using a line bender to fold the acrylic.

Question 3

(a) Most candidates could explain why the toggle clamp has holes in the base and often scored full marks.

(b) (i) Candidates found it challenging to explain how a plastic coating could be applied to the handle. However, there were some clear explanations of plastic dip coating. Safety precautions were not always included or were generic.

(ii) Candidates gave a very wide range of different explanations of a method to make joint **A** pivot and many found the question challenging.

(c) Candidates found it very challenging to explain how the toggle clamp is designed to be adjustable to prevent damage to the material being clamped. The adjustable aspect of the toggle clamp was rarely fully communicated in responses.

Section B

Question 4

(a) Candidates usually scored at least one mark and mostly understood the function of **X**.

(b) Most candidates answered this question correctly, identifying several different problems with the design of the folding table.

(c) Most candidates were able to respond to the two problems identified in **(b)** and used notes and sketches to show how the problems could be overcome. Most answers focussed on the legs being too long to fold under the table, the tabletop hinge being in the wrong position and the legs collapsing as there was no means of securing them in vertical position. Those candidates who correctly identified problems and subsequently followed the instructions gave some detailed answers.

(d) Candidates gave a broad range of answers relating to their understanding of why manufacturers use standardised components. Economic benefits regarding the reduced cost of the components and not needing to carry stock were often communicated well. Thorough explanations and examples were not always given.

Question 5

(a) Most candidates understood the function of **X.**

(b) Most candidates answered this question correctly, identifying several different problems with the design of the packaging.

(c) Most candidates were able to respond to the two problems identified in **(b)** and used notes and sketches to show how the problems could be overcome. Many answers focused on the middle wood sample not fitting the packaging, the incomplete closure and development also being

incomplete. Those candidates who correctly identified problems and subsequently followed the instructions gave some detailed answers.

(d) Most candidates were able to explain why designers use CAD to develop and communicate ideas. Candidates who discussed issues such as how easy it is to share CAD design proposals with customers, the speed of construction on CAD as well as the ease of deleting mistakes or indeed editing a design answered well. Examples were not always given.

Question 6

(a) Most candidates were able to explain feature **X.**

(b) Most candidates answered correctly, identifying several different problems with the design of the coffee machine.

(c) Candidates found this question straightforward if **(b)** had been answered well, but diagrams often lacked detail.

(d) Candidates often had a good understanding of why designers consider ergonomics during the design process. User comfort, accessibility and safety with hot liquids were often given in responses.

Section C

Question 7

(a) There were many well-structured answers showing ideas for a shelf to prevent the potted plants sliding off. Often ideas were very similar and occasionally the need for excess water to be collected was not covered. Three ideas were usually produced with some candidates showing development, but a number of candidates only offered one idea. The final solution was often realistic with good detail. Evaluation ranged from generic commentary through to some good comments on positive and negative points.

(b) Candidates offered a wide variety of answers on the design of a frame that attaches to the trolley base. Some candidates found this question challenging, often with similar ideas communicated and omitting the requirement for the upper shelf to be adjustable.

(c) Candidates offered some realistic answers but some found it challenging to produce a range of ideas for a plant label that could be easily changed. Most candidates covered the protection from moisture aspect in the question well.

(d) This question was generally answered well with some good use of rendering styles. However, some candidates did not apply any render at all. There were some good responses with three-dimensional drawings used.

Question 8

(a) Many candidates found it challenging to offer a range of ideas for an instruction sheet that used pictures rather than words. Evaluation ranged from generic commentary through to some good annotation of positive and negative points.

(b) Candidates found it challenging to offer more than one idea on how the foam tiles could be joined to make a play mat.

(c) Candidates generally produced a range of ideas for a carry case. Stronger answers gave some realistic ideas to keep the instruction sheet visible to the user.

(d) This question was generally answered well with some good use of rendering styles. However, some candidates did not apply any render at all. There were some good responses with three-dimensional drawings used.

Question 9

(a) Many candidates found the technical aspects of designing a temporary attachment for the metal tube challenging. The range of ideas was often very similar in nature or there was only a single idea given. Evaluation ranged from generic commentary through to some annotation of positive and negative points.

(b) Some candidates found it challenging to offer a range of different ideas for raising and lowering the bucket that could be operated from the top of the scaffold.

(c) Candidates were able to offer at least one idea for a device that gave a visual and audible warning when the bucket is being raised or lowered.

(d) This question was generally answered well with some good use of rendering styles. However, some candidates did not apply any render at all. There were some good responses with three-dimensional drawings used.

DESIGN AND TECHNOLOGY

Paper 9705/12
Written

Key messages

To do well, it is vital that candidates cover the full content of the specification.

In ***Section B*** part **(d)** analysis questions, candidates did not always identify the key phrases/requirements of the question or include relevant examples to evidence their understanding or extend their answers to justify full understanding of a relevant point.

General comments

Sections A and ***B*** were generally accessible to candidates who had prepared well. Process knowledge was good with all three questions in ***Section A*** being attempted with a clear understanding of basic knowledge. Occasionally health and safety points that candidates added were irrelevant to the process and were sometimes generic.

Candidates generally found the three questions in ***Section C*** accessible with some good answers seen. However, candidates should be reminded that the terms 'develop' and 'range' mean that they should give several different ideas, which they then evaluate to allow further development into a final proposal for each part of the question.

Components, mechanisms, and construction techniques are particularly helpful. Having a coherent layout of page with designated areas for a range of designs, evaluation, and development helped candidates to focus their attention and time. Evaluation of initial ideas was often limited in detail and sometimes did not include any of the aspects that were very clearly required for the question.

Comments on specific questions

Section A

Question 1

(a) Generally, this question was answered well and most candidates could give two reasons why recycled card had been used.

(b) (i) Stronger answers clearly detailed marking out, cutting out and then finishing the set of 80mm diameter holes. Many candidates used technical terms for the tools and equipment that were used. Safety precautions were not always included. However, some candidates misunderstood the question and used recycled card for the side panels rather than plywood.

(ii) Generally, this question was answered well with candidates understanding the steps necessary to prepare and apply a finish to the plywood side panels.

(c) Candidates found it challenging to explain two temporary methods of joining part **A** to part **B**. Stronger answers included adding a rod perpendicular to the tubes so that they could not pull back through the side panels or using plastic end caps. Some candidates gave gluing as a solution, which is not a temporary method.

Question 2

(a) Most candidates were able to correctly explain at least one reason why the crate had holes in it. Air circulation and allowing water to drain away were popular responses.

(b) Most candidates answered this question well showing an understanding of the shape of the one-piece development net.

(c) Candidates had a thorough understanding of marking out, cutting out and folding the development net, including the use of tools and equipment. There were some excellent examples of making the development net with hand tools as well as CAD/CAM. Safety precautions were often very sensibly described.

(d) Candidates gave a wide variety of answers to this question. All candidates could describe how to put a label that could be updated with information on the box. However, many candidates omitted the method of designing and making the label.

Question 3

(a) Most candidates gave at least one reason for making a model of a mechanism. Testing and evaluating of how the mechanism works as well as being able to see it three dimensionally were often given as answers.

(b) Candidates found it challenging to explain how to make the handle component. However, there were some clear explanations of marking out and cutting out the bracket based on traditional methods of fabrication. Safety precautions were not always included or were generic.

(c) (i) Candidates gave a very wide range of different explanations of how to make a batch of 1000 of Part **B** but many found the question challenging. Some candidates gave some very detailed answers on injection moulding, clearly understanding the process very well.

(ii) Candidates found it challenging to explain how the compound pulley system makes it easier to lift loads. Mechanical advantage was rarely given in answers.

Section B

Question 4

(a) Candidates usually scored at least one mark and often clearly understood the function of **X**.

(b) Many candidates answered this question correctly, identifying several different problems with the design of the garden shed.

(c) Most candidates were able to respond to the two problems identified in **(b)** and used notes and sketches to show how the problems could be overcome. Most answers focussed on the guttering being on the wrong side of the roof, untreated softwood rotting over time and the lack of doors and windows. Those candidates who had correctly identified problems and subsequently followed the instructions gave some excellent fully detailed answers that scored full marks.

(d) Candidates gave a broad range of answers relating to their understanding of why many products are designed to be assembled at home. Difficulties with transporting large items and saving the manufacturer time and money to assemble products were often communicated well. Thorough explanations and examples were not always given.

Question 5

(a) Most candidates understood the function of **X.**

(b) Many candidates answered this question correctly, identifying several different problems with the design of the sock packaging.

(c) Most candidates were able to respond to the two problems identified in **(b)** and used notes and sketches to show how the problems could be overcome. Most answers focused on the socks being able to slide out of the packaging easily, there being no means of hanging the package on a rack in a shop for display purposes and limited surface detail. Those candidates who had correctly identified problems and subsequently followed the instructions gave some excellent fully detailed answers that scored full marks.

(d) Most candidates were able to explain why designers use research to inform their designs. Candidates discussed issues such as checking on existing packaging solutions and then on how competitors are packaging products, the need to meet legislation and learning from previously designed packaging in both a positive sense of what has worked and a negative sense of what has not worked. Examples were not always given.

Question 6

(a) Most candidates were able to explain feature **X.**

(b) Most candidates answered correctly, identifying several different problems with the design of the coffee machine.

(c) Candidates found this section straightforward if **(b)** had been answered well, often with good diagrams included.

(d) Candidates often had a good understanding of why designers consider the effects of form and surface finishes. Aesthetics, being easy to clean and functionality were included in good answers.

Section C

Question 7

(a) Most well-structured answers showed ideas for a box to hold precious items. Often ideas were very similar and occasionally the need for a lid that could be locked was overlooked. Three ideas were usually produced with some candidates showing development. The final solution was often realistic with good detail. Evaluation ranged from generic commentary through to some good comments on positive and negative points.

(b) Candidates offered a wide variety of answers on the design of a decorative panel. Some candidates found this question challenging, often with similar ideas communicated, omitting the requirement for the user to able to personalise the decorative panel.

(c) Candidates offered some good answers but sometimes found it challenging to produce a range of ideas for holding six rings.

(d) This question was generally answered very well with some good use of rendering styles. However, some candidates did not apply any render at all. There were some outstanding responses with excellent three-dimensional drawings.

Question 8

(a) Most candidates produced a range of ideas for a development (net) for a paper carrier bag. Three ideas were usually produced but some candidates did not show development nets and focused just on the three-dimensional shape of the bag. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points.

(b) Candidates found this question accessible and often presented a good range of different ideas for a logo to represent GL clothes.

(c) Candidates generally produced a range of ideas for an attachment to make the bag more comfortable to carry. Stronger candidates gave some excellent ideas that were both realistic and creative.

(d) This question was generally answered well with a variety of rendering styles and quality. However, some candidates did not apply any render at all. There were some outstanding responses with superb three-dimensional drawings.

Question 9

(a) Most candidates found the technical aspects accessible, with adjustment to different angles often well communicated. Three ideas were usually produced with some candidates showing development. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points.

(b) Some candidates found it challenging to offer a range of different ideas for holding a circuit board without damaging the components.

(c) Candidates were able to offer a range of different ideas for a lighting attachment. The attachment method was often well communicated with good technical detail.

(d) This question was generally answered well with a variety of rendering styles and quality. However, some candidates did not apply any render at all. There were some outstanding responses with superb three-dimensional drawings.

DESIGN AND TECHNOLOGY

Paper 9705/13
Written 13

Key messages

To do well, it is vital that candidates cover the full content of the specification.

In ***Section B*** part **(d)** analysis questions, candidates did not always identify the key phrases/requirements of the question or include relevant examples to evidence their understanding or extend their answers to justify full understanding of a relevant point.

General comments

Sections A and ***B*** were generally accessible to candidates who had prepared well. Process knowledge was good with all three questions in ***Section A*** being attempted with a clear understanding of basic knowledge. Occasionally health and safety points that candidates added were irrelevant to the process and were generic.

Candidates generally found the three questions in ***Section C*** accessible with some good answers seen. However, candidates should be reminded that the terms 'develop' and 'range' mean that they should give several different ideas, which they then evaluate to allow further development into a final proposal for each part of the question.

Components, mechanisms, and construction techniques were particularly helpful. Having a coherent layout of page with designated areas for a range of designs, evaluation, and development helped candidates to focus their attention and time. Evaluation of initial ideas was often limited in detail and sometimes did not include any of the aspects that were very clearly required for the question.

Comments on specific questions

Section A

Question 1

(a) Generally, this question was answered well and most candidates could state how to attach the hands to the clock. The hands being able to rotate was more of a challenge for some candidates.

(b) (i) Stronger answers clearly detailed both marking out, cutting out and then finishing the clock face. There were some excellent examples of making the clock face with hand tools as well as CAD/CAM. Many candidates used technical terms for the tools and equipment used. Safety precautions were not always included.

(ii) Candidates gave a wide variety of answers to this question. Detailed answers included the use of CAD to design the numbers and then a vinyl cutter to make them before sticking to the plastic shapes.

(c) Candidates often gave good detail in their answers with many responses offering injection moulding or 3D printing. However, some candidates communicated answers that were not feasible and omitted the need for a batch of 2000.

Question 2

(a) Most candidates were able to correctly explain at least one reason why corrugated card is a suitable material for the coffee table. Corrugated card being readily available and easy to cut, and shape were popular responses.

(b) Generally, this was a well answered question, with candidates understanding the shape of the one-piece development net.

(c) (i) Candidates had a thorough understanding of marking out and cutting out the development net, including the use of tools and equipment. There were some excellent examples of making the development net with hand tools as well as CAD/CAM. Safety precautions were often very sensibly described.

(ii) Candidates gave a wide variety of answers to this question. Detailed answers included the use of CAD to create the pattern with the application of a protective plastic covering as a waterproofing solution.

Question 3

(a) Most candidates gave two reasons why the food mincer is designed to be taken apart. Replacement parts and more accessible cleaning were frequently given as answers.

(b) There were some clear explanations of either using a template, marking out and cutting out with traditional methods, such as a lathe or the use of CAD/CAM. Safety precautions were not always included.

(c) (i) Candidates gave a very wide range of different explanations of the action of the auger and many found the question challenging.

(ii) Candidates found it challenging to explain how the length of the crank impacts upon the user. Mechanical advantage was rarely given in responses.

Section B

Question 4

(a) Candidates usually scored at least one mark and often clearly understood the function of **X**.

(b) Many candidates answered this question correctly, identifying several different problems with the design of the sunshade.

(c) Most candidates were able to respond to the two problems identified in **(b)** and used notes and sketches to show how the problems could be overcome. Most answers focussed on the size and weight of the base, the canvas being bigger than the arm and the canvas not having a frame for support. Those candidates who had correctly identified problems and subsequently followed the instructions gave some excellent fully detailed answers that scored full marks.

(d) Candidates gave a broad range of answers relating to their understanding of why manufacturers undertake risk assessments on all manufacturing processes. Thorough explanations and examples were not always given.

Question 5

(a) All candidates understood the function of **X**.

(b) Many candidates answered this question correctly, identifying several different problems with the design of the birthday cake packaging.

(c) Most candidates were able to respond to the two problems identified in **(b)** and used notes and sketches to show how the problems could be overcome. Common answers focused on the weakness of the lid as it does not have a closure or support, the cake moving around in the box and the outer sleeve being too small for the box to fit inside. Those candidates who had correctly

identified problems and subsequently followed the instructions gave some excellent fully detailed answers that scored full marks.

(d) Candidates clearly understood that designers of packaging consider the protection of the products important. Candidates discussed issues such as reducing the damage to a product, the need to replace damaged products and the economic implications as well as keeping food stuff sealed and hygienic to avoid a contaminant. Examples were not always given.

Question 6

(a) Most candidates were able to explain why a rubber grommet had been used for the electric cable.

(b) Most candidates answered this question correctly, identifying several different problems with the design of the lamp.

(c) Candidates found this question straightforward if **(b)** had been answered well, often with good diagrams included.

(d) Candidates often had a good understanding of the impact of mass-production on the people involved. Positive and negative impacts were communicated with a wide range of people considered. Some candidates found this question challenging and did not extend their answers or give many examples.

Section C

Question 7

(a) Most well-structured answers showed ideas for a stand for the mirror. Often ideas were very similar and occasionally the need for a 500 mm vertical height above the floor was a little limited. Three ideas were usually produced with some candidates showing development. The final solution was often realistic with good detail. Evaluation ranged from generic commentary through to some good comments on positive and negative points.

(b) Candidates offered some excellent ideas on how to allow the mirror to be adjusted to different angles.

(c) Candidates offered some good answers but sometimes found it challenging to produce a range of ideas for a shoe rack. Many candidates did not consider how the show rack would connect to the mirror.

(d) This question was generally answered well with a variety of rendering styles and quality. However, some candidates did not apply any render at all. There were some outstanding responses with excellent three-dimensional drawings.

Question 8

(a) Most candidates produced a range of ideas for a freestanding slot-together robot. Three ideas were usually produced with some candidates showing development. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points. Occasionally using a minimum of four pieces of foamboard was not included.

(b) Candidates did not always offer a range of different ideas for the set of stickers, often with many similar outcomes. The key facial features of the ‘Robot Heroes’ were sometimes not included.

(c) Candidates generally produced a range of different A5 leaflet holders for promotional materials but often did not consider how it would attach to the robot.

(d) This question was generally answered well with a variety of rendering styles and quality. However, some candidates did not apply any render at all. There were some outstanding responses with superb three-dimensional drawings.

Question 9

(a) Most candidates answered this question well. Three ideas were usually produced with some candidates showing development. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points.

(b) Candidates were able to detail a solution for raising and lowering the platform. Some candidates found it challenging to offer a range of different ideas for the platform. They occasionally found the technical concepts a challenge to communicate.

(c) Candidates were able to offer a range of different ideas for a lighting control system. Occasionally candidates offered suggestions that did not fulfil the question, omitting the need for independent control and the ability to be dimmed. Technical detail was often very limited.

(d) This question was generally answered well with a variety of rendering styles and quality. However, some candidates did not apply any render at all. There were some outstanding responses with superb three-dimensional drawings.

DESIGN AND TECHNOLOGY

Paper 9705/32
Written 32

Key messages

- It is important that candidates take sufficient time to consider all aspects of each question. Some candidates produced well-structured responses to **Question 1** but did not apply focus to all of the key areas given. For **Question 12**, some candidates missed the requirement to design a point of sale display for a battery powered drill.
- When responding to **part (b)** of **Question 3** and **Question 9**, it was important that explanations given about why a process is particularly suitable for the production of the chosen item were clear and detailed. Many candidates presented very brief, often single word responses. The examples given in mark schemes are to be expanded upon by candidates as the question gives the command to explain.
- When generating design ideas in questions in ***Section B***, candidates should ensure that that their evaluation of possibilities is clearly given. Marks are awarded for the evaluation of ideas and the selection of an idea or features leading to further development. Some candidates used a tick list which was insufficient to show design thinking.

General comments

There were very few instances where candidates did not follow the instructions correctly. Almost all candidates appeared to use their time effectively and most made full attempts at their chosen questions.

Candidates generally made excellent use of sketches and notes when required in their answers to questions in ***Section A***.

Responses to questions requiring the candidate to 'discuss' were mostly full of detail and were structured well. In some instances, candidates focused on a single issue which did not allow them to access the highest mark range. There were a few very brief responses, some with lists or bullet points which was an inappropriate way to present an answer to this type of question.

In ***Section B***, candidates should be reminded to avoid repeating details from the question in their specification and should focus on an analysis of the design situation rather than producing a generic chart with limited or no specific reference to the problem given. Some candidates used a pencil that had lead that was too hard. Some of the sketch work and design work was difficult for examiners to see. An HB pencil or equivalent is advised.

Comments on specific questions

Section A

Part A

Question 1

Some candidates misread this question and focused on the design and manufacturing stages involved in a particular product with limited or no reference to a client or to target markets.

Question 2

(a) Almost all candidates stated an appropriate material for Part **A**, the knurled adjusting handle and Part **B**, the stem and gave valid reasons for their choice. Some candidates stated wood, metal or

plastic which were not accepted. Some candidates gave single word responses for the reasoning for their suitability which again did not gain credit.

(b) This question was answered generally very well. Most candidates made very good use of notes and sketches to describe an appropriate method of manufacturing a prototype in a school workshop. Most methods presented were appropriate, but some candidates misread the question and referred to high quantity industrial methods. In most responses to **Part A**, the knurled adjusting handle was fully detailed, but some candidates made limited or no reference to the turning operations required.

(c) Most candidates answered this question well. Many suggested appropriate design changes and gave details of correct batch production methods. A significant number of candidates referred to injection moulding but gave very limited or no detail of the mould required.

Question 3

(a) Most candidates made very good use of sketches and notes to produce detailed descriptions of their chosen processes. The process of pressing was correctly and fully described by most candidates. Correct responses for a process to profile form the tongue and groove floorboard included the use of plough/rebate planes, spindle moulder or handheld router. Some candidates produced very brief descriptions of using a mallet and chisel to form the profile, but this would not ensure the accuracy required. Some candidates accurately described the process of enamelling the pendant, but a few incorrectly described the process of etching.

(b) This question was generally answered well. Most candidates gave valid and full explanations as to why the process of pressing was suitable for the tray and profile forming for the tongue and groove floorboard. Some candidates produced single word or very brief responses with limited detail and did not access the higher mark range.

Part B

Question 4

(a) (i) (ii) Both parts were answered correctly by most candidates

(b) There were some functional and appropriate proposals for the torch casing. Some candidates did not include key details such as the switch positioning. Most candidates used sketches and notes well to describe an appropriate method of manufacturing the casing.

Question 5

Most responses included a good range of relevant issues and were comprehensive and presented in a logical manner. Some candidates included several ways in which computers are used in design, production and management in industry but did not make comment on their impact.

Question 6

(a) Some candidates correctly referred to the ability of stainless steel to be pressed into shape for the bowl part of the spoon and additional features, and the ability of polystyrene to be injection moulded into shape. Not all candidates referred to aesthetic features.

(b) This question was generally answered well and most candidates presented appropriate processes and materials with clear reference to properties.

(c) Some candidates correctly referred to sustainability issues and disposable culture. Many candidates did not attempt this part.

Part C

Question 7

Candidates generally redrew what was given in **Fig. 7.1** to a correct scale. There were very few correct attempts to draw an elevation to the right of Elevation **A** and to complete Elevation **B.**

Question 8

Some candidates produced full and very well-structured answers, covering a good range of issues and introducing appropriate evidence to support their arguments. Most responses focused only on the cost of materials and production. A wider discussion of issues such as marketing and volume of production would have enabled access to the higher mark range. Some candidates made limited or no reference to graphic products.

Question 9

Most responses were very brief and lacking in detail of specialist knowledge of graphic products.

(a) The most popular choice of process was the printing of a batch of 10 000 fashion catalogues. Very few candidates presented accurate and detailed methods of printing. A few candidates correctly described the process of printing a logo onto a batch of 50 T-shirts using screen printing. A die cutting process was correctly described by most candidates whose chosen item was the document holder.

(b) Most attempts to this question were very brief with candidates often giving single word responses and these were not awarded credit. The question required candidates to explain why the process was particularly suitable for the production of the item.

Section B

The vast majority of candidates used their time effectively to complete all of the requirements of their response in ***Section B***. Presentation of work was generally of a very good standard and most candidates demonstrated their knowledge of appropriate materials and construction techniques.

Most candidates considered the initial thoughts and broader issues related to the given problem/situation in their analysis. This provided the key points to help to develop a specification. Some candidates produced generic charts, usually in the form of a spider diagram, that had no specific reference to the problem and received little credit. It was important that candidates focused on the problem stated and fully explored the requirements of the question.

Some specifications were generic, using brief terms such as safe to use, aesthetically pleasing, environmentally friendly and easily available materials. With very limited or no reference to the problem/situation they could not be awarded marks.

The majority of candidates produced an appropriate range of different design ideas with many including the exploration of sub-problems. For some candidates, initial ideas tended to be very similar, showing little in the way of creativity or innovation and these candidates often did not fully address the design brief.

Most work in the exploration of ideas section was well annotated including functional, material and construction detail. Not all candidates produced an on-going evaluation of their design ideas, highlighting the evaluative comments which would help in the selection of ideas or features for further development.

To achieve the higher marks, candidates needed to have evidence of evaluative comment on their ideas and reasoned judgment on the best solution or features to take forward. A tick list against the specification needed to have additional explanation.

The majority of proposed solutions were functional and well-presented. Most candidates included clear additional detail such as key dimensions, components used, materials and finishes.

Some candidates produced detailed and valid evaluations of their proposal; describing the positive features and functional details and suggesting possible modifications or improvements. Some used sketches to show possible improvements which was helpful.

Question 10

Some candidates focused on slight variations of a single concept. Candidates who explored a wider range of significantly different ideas with some very innovative possibilities accessed the higher mark ranges. There was very clear evidence of candidates applying knowledge and understanding of appropriate materials and methods of construction. Many ideas had detailed mechanical and technical features.

Acceptable specifications included:

- The product must be stable and fixed in position to ensure comfortable reading.
- Adjusting mechanisms should be easy to operate and not require too much pressure.
- The product should be easy to fold away for storage.
- The product could have the additional function of holding a drink.
- The product should have a feature to hold pages whilst reading and not require the user to hold the book or magazine open.

Question 11

There were a number of possibilities explored by candidates for this question. Many candidates focused on hand-operated systems, applying well designed lever or screw mechanisms. Some very innovative foot-operated systems were also seen. Many responses were feasible and highly technical and fully considered all requirements of the question. Some candidates focused only on one concept with minor alterations.

Acceptable specifications included:

- The product must not require excessive effort as the hole is quite large and levers should be used to give a mechanical advantage.
- Material used for the cutter must be able to keep a sharp edge and maintain a circular form under pressure.
- The product should have a wide base to avoid damage to the green when applying pressure to cut the hole.
- The product should have protection for use in wet conditions.
- The product should have a system to ensure that the cutting component cuts vertically and is removed vertically to ensure neatness and accuracy.

Question 12

Some candidates presented very imaginative ideas for the packaging and point of sale display. Most candidates applied equal focus to both the packaging and the point-of-sale display, but a significant number of candidates did not include any ideas relating to the point-of-sale display. Not all candidates considered that the packaging should be more eco-friendly.

Acceptable specifications included:

- The packing should be used to allow for the drill to be stored when not in use.
- The packaging should have sections for other features such as charger, spare battery and drills.
- The packaging should include a carrying handle to easily transport from vehicle to site.
- The point-of-sale display should have a lockable system that would allow a salesperson to unlock and allow for the drill to be held by a customer.
- The point-of-sale display could include a work piece and safety goggles to allow the customer to use the drill under supervision.

DESIGN AND TECHNOLOGY

Paper 9705/33
Written 33

Key messages

- Some candidates used a pencil that had lead that was too hard. Some of the sketch work and design work was very difficult for examiners to see. An HB pencil or equivalent is advised.
- When answering questions similar to **Question 1**, candidates should ensure that they follow the requirements of **part (b)** correctly. Some candidates did not follow the instruction that the table was to be made in a school workshop and incorrectly produced responses relating to large quantity production methods. **Part (c)** often gives the opportunity to present this information.
- When generating design ideas in questions in ***Section B***, candidates should ensure that that their evaluation of possibilities is clearly given. Marks are awarded for the evaluation of ideas and the selection of an idea or features leading to further development. Some candidates used a tick list which was insufficient to show design thinking.

General comments

There were very few instances where candidates did not follow the instructions correctly. Almost all candidates appeared to use their time effectively and most made full attempts at their chosen questions.

Candidates generally made excellent use of sketches and notes when required in their answers to questions in ***Section A***.

Responses to questions requiring the candidate to 'discuss' were mostly full of detail and were structured well. In some instances candidates focused on a single issue which did not allow them access to the highest mark range. There were a few very brief responses from candidates, some using lists or bullet points which was an inappropriate way to present an answer to this type of question.

Comments on specific questions

Section A

Part A

Question 1

(a) Almost all candidates stated appropriate materials for the table giving valid reasons.

(b) Most candidates made very good use of sketches and notes to present clear descriptions of a variety of appropriate manufacturing methods for the table in a school workshop. Some candidates did not consider the instruction that the table was to be made in a school workshop and incorrectly produced responses relating to large quantity production methods.

(c) Many candidates modified the design of the table to be a self-assembled product and selected injection moulding as the manufacturing method. Most responses explained the process well but not all candidates produced clear details of the mould/s required.

Question 2

Responses to this question were generally good with most candidates focusing on manufacturing processes required and demand for the product. Some candidates referred only to the different types of quantity

production methods with limited or no detail of the considerations made to the selection of quantity production systems for a product.

Question 3

The most popular choice of processes was the comb joint for the storage box and calendering for the floor tile. Very few candidates made full attempts at the internal and external threading of the threaded fixing.

(a) Most candidates used sketches and notes well to describe the processes of cutting a comb joint and calendering in detail. The few responses describing the process of internal and external threading were mostly fully detailed and achieved high marks.

(b) This question was generally answered well. Most candidates gave valid and full explanations as to why the process of cutting a comb joint was suitable for the storage box and calendering for the floor tile. Some candidates produced single word or very brief responses with limited detail and did not access the higher mark range.

Part B

Question 4

There were no attempts at this question.

Question 5

There were no attempts at this question.

Question 6

There were no attempts at this question.

Part C

Question 7

There were a number of outstanding responses to this question. Parts were accurately aligned in the exploded isometric drawing and thick and thin line technique was applied well. Some candidates produced a good quality isometric drawing but did not explode the parts and so could not access the full mark range.

Question 8

Responses were generally full, structured well and covered most of the key issues involved. Most candidates focused on the positioning of products and displays to allow easy and effective circulation and the security of products. Not all candidates included relevant examples of evidence to support their answers, such as specific exhibition features or methods used to ensure product security, but work produced was generally very good.

Question 9

There were a number of accurate and full responses for the completed orthographic drawing of the pipe intersection. Correct construction methods were used to complete the elevations accurately and draw the plan to the correct scale.

Some candidates redrew the elevations given in **Fig. 9.1** accurately but made very limited or no attempt to complete them or draw the plan.

Section B

Most candidates used their time effectively to complete all of the requirements of their response in ***Section B***. Presentation of work was generally of a very good standard and most candidates demonstrated their knowledge of appropriate materials and construction techniques.

Most candidates considered the initial thoughts and broader issues related to the given problem/situation in their analysis. This provided the key points to help to develop a specification. Some candidates produced generic charts, usually in the form of a spider diagram, that had no specific reference to the problem and received little credit. It was important that candidates focused on the problem stated and fully explored the requirements of the question.

Some specifications were generic using brief terms such as safe to use, aesthetically pleasing, environmentally friendly and easily available materials. With limited or no reference to the problem/situation, they could not be awarded marks.

The majority of candidates produced an appropriate range of different design ideas with many including the exploration of sub-problems. For some candidates, initial ideas tended to be very similar, showing little in the way of creativity or innovation and these candidates often did not fully address the design brief.

Most work in the exploration of ideas section was well annotated including functional, material and construction detail notes. Not all candidates produced an on-going evaluation of their design ideas, highlighting the evaluative comments which would help in the selection of ideas or features for further development.

To achieve the higher marks, candidates needed to have evidence of evaluative comments to their ideas and reasoned judgment on the best solution or features to take forward. A tick list against the specification needed to include explanation.

The majority of proposed solutions were functional and well presented. Most candidates included clear additional detail such as key dimensions, components used, materials and finishes.

Some candidates produced detailed and valid evaluations of their proposal, describing the positive features and functional details and suggesting possible modifications or improvements. Some used sketches to show possible improvements which was helpful.

Question 10

There were some very creative responses to this question. Candidates explored different shapes and methods of assembly to provide an exciting display system.

Some candidates focused on very similar concepts with minor alterations. A wider range of significantly different ideas was required to access the higher mark ranges.

Acceptable specifications included:

- The system must be rigidly fixed in position to prevent movement and possible damage to display items.
- The system must include space to give details of the display items.
- The system must be easily and quickly assembled and disassembled to change configuration regularly.
- The system must have secure areas to prevent delicate items being touched or removed.
- The system must be constructed to the highest possible standard to promote high quality design and technology.

Question 11

Most candidates produced feasible and functional designs, meeting the requirements to securely lift and reposition plants and to be easy to store.

Some candidates explored innovative ways of lifting, securing and moving the plant.

The majority of developed solutions focused on a wheeled, hand operated trolly system. There were many different and imaginative variations of wheel combinations and lifting and securing methods. Most products were designed to either fold easily or disassemble for storage.

Candidates demonstrated a good understanding of appropriate materials and manufacturing possibilities.

Acceptable specifications included:

- The plant pot is large and could be heavy so the product must have wide wheels to avoid possible damage to the shopping centre floor.
- The product should have a method of securing the plant quickly and easily to prevent it from falling.
- The product should be easily folded for storage and securely fixed in position when in use.
- The product should have a comfortable handle for one person to hold when lifting, transporting and repositioning a plant.
- The product could be designed to be multi-functional to transport other items around the shopping centre.

Question 12

Some responses were of a very high quality with imaginative ideas for the model of a mascot relating to the chosen sport and appropriate and memorable names suggested. The quality of presentation of work was outstanding from some candidates.

A number of candidates did not consider the idea that the mascot was to be printed onto A3 card to be cut out and assembled to shape.

Acceptable specifications included:

- The model of the mascot will use colours and possibly symbols/features that represent the country of choice.
- The model of the mascot must appeal to all age groups to maximise promotion and product opportunities.
- The model should be suitable for use in the design of other promotional products.
- The model could be clothed in different sportswear to cover a wide range of Olympic sports.
- The model could be printed in outline to encourage purchasers to apply colour.