

DESIGN AND TECHNOLOGY

Paper 9705/11 Written 1
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Key messages

Sections A and **B** were accessible where candidates had prepared well. Process knowledge allowed all three questions in **Section A** to be attempted with some understanding of the basic knowledge.

However, to really excel it is imperative that the specification receives full coverage through the scheme of work that teachers plan and use to deliver the material.

Section B part (d) analysis questions were a challenge for candidates who did not always include relevant examples to evidence their understanding or extend their answers to justify full understanding of a relevant point.

General comments

It is important that centres reiterate that the terms 'develop' and 'range' in **Section C** mean that the candidates should be offering 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 well detailed in some responses.

Evaluation of candidates' initial ideas was often limited in detail and sometimes did not include any of the aspects that were very clearly requested in the question.

Comments on specific questions

Section A

Question 1

- (a) Some candidates were able to show that plywood is made up of layers although it was rare to have the added detail of the grain running at right angles in the differing layers.
- (b)(i) Most candidates understood that marking out the holes equally spaced was important to aid cutting out accurately. Some candidates used technical terms for the tools and equipment that were being used. Safety precautions were not always included.
- (ii) Candidates found this question challenging with the need for accurately spacing the joining pieces sometimes being misunderstood. Some candidates used technical terms for the tools and equipment that were being used. Safety precautions were not always included.
- (iii) Candidates found this question challenging, with a broad range of processes communicated to make the 50 plastic counters. Often details on tools and equipment were lacking technical language.

Question 2

- (a) Most candidates were able to state at least one reason with aesthetic appeal and corrosion resistant being the most popular answers.

- (b)(i) Some candidates included detail on how to cut out and finish the edges, with a reasonable understanding of the steps required. Candidates did not always use technical terms for the tools and equipment that were being used. Safety precautions were not always included.
- (ii) Candidates found this question challenging. Marking out and cutting was generally fine although the need for accuracy with using a template or one acrylic sheet being placed on top of the other and clamped together before drilling often required further detailed explanation. Tools, equipment, and processes were generally well covered.
- (iii) Candidates found this question challenging. The tools required were occasionally named but with very little detail on how to use them.

Question 3

- (a) This question was well attempted, with adding rigidity and splash proofing the paper being popular answers.
- (b)(i) There was a significant amount of detail included in lots of responses with candidates clearly understanding how to produce the image and lettering. Tools, equipment, and processes were generally well covered. Safety precautions were often not added.
- (ii) This question was well answered, with good understanding of how the foam board could be cut out and joined. Tools, equipment, and processes were generally well covered as were safety precautions.
- (iii) Candidates offered some interesting ideas on how to make an alternative menu holder from acrylic. However, several responses lacked the detail to fully understand how the idea would be made.

Section B

Question 4

- (a) Candidates mostly scored full marks when they justified the function of X.
- (b) Many candidates answered this aspect correctly, identifying several different problems with the design of the money box.
- (c) Most candidates were able to respond to the two problems identified in **part (b)** and use notes and sketches to show how the problems could be overcome. Common answers focused on a lack of glue tabs, a fold line being drawn as a cut line which would mean the glue tab would fall off and the end of the box being missing. Those candidates who had correctly identified problems and subsequently followed the instructions gave some good answers.
- (d) Candidates who discussed such issues as recycling card being environmentally friendly, less trees needing to be cut down, a possible marketing strategy and an aesthetic opportunity did score reasonably well. Examples were not always given.

Question 5

- (a) Most candidates understood the function of part X.
- (b) Candidates found identifying different problems with the design of the storage crate challenging.
- (c) Candidates were, on occasion, able to respond to a problem identified in **part (b)** although they did not always include enough detail in their explanations or sketches.
- (d) Candidates were able to communicate a basic understanding of why the storage rack was adjustable. Examples were not always given.

Question 6

- (a) The few candidates that answered this question found it difficult to communicate how fashion has influenced the design of the lamp.
- (b) Candidates mostly answered this aspect correctly, identifying at least one problem with the design of the adjustable electric lamp.
- (c) Most candidates were able to respond to at least one problem identified in **part (b)** and use notes and sketches to show how the problem could be overcome. Common answers focused on the very small base causing a lack of stability, the joints being fixed which meant the lamp could not be adjusted, and the on/off switch and mains plug also missing.
- (d) Some candidates had a basic understanding of why surface finishes are used on products such as lamps, but candidates did not always extend their answers or give many examples.

Section C

Question 7

- (a) There were some well-structured answers but often only showing one design for the child's bed that prevented them falling out. Development was often limited in detail and evaluation ranged from generic commentary through to some better comments on positive and negative points.
- (b) Candidates offered some good ideas for a seat that included storage for toys. However, there was rarely a range of different ideas, which then also affected the marks available for development and evaluation.
- (c) Candidates offered some good ideas for a detachable ladder. However, there was rarely a range of different ideas, which then also affected the marks available for development and evaluation.
- (d) This question was generally well answered with a variety of rendering styles and quality. However, some candidates did not apply any render at all, which impacted the credit they received for their answer. There was evidence of some good responses with three-dimensional drawings. Some candidates chose to complete this section at the expense of **part (c)**.

Question 8

- (a) Candidates only showed one design for the plastic tray that will securely hold parts of the trophy. Development and evaluation were limited in detail.
- (b) This question was not attempted.
- (c) Candidates only showed one design for the leaflet. Development and evaluation were limited in detail.
- (d) This question was not attempted.

Question 9

- (a) Candidates mostly produced a range of ideas for holding the screwdriver bits. Candidates did not always show a method of locking the bits in position. Development and evaluation were limited in detail.
- (b) Candidates mostly understood how to design an ergonomic handle and the better responses included a light as well. Development and evaluation were occasionally limited in detail.
- (c) Candidates mostly only showed one design for a holder for the handle and bits. Development and evaluation were limited in detail.



- (d) This question was challenging for candidates, with the pictorial (3D) drawing being difficult. Render was also not applied at all, which impacted the credit awarded to the candidate's response.

DESIGN AND TECHNOLOGY

Paper 9705/12 Written 1
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Key messages

Sections A and **B** were generally accessible where candidates had prepared well. Process knowledge was good with all three questions in **Section A** being attempted with a clear understanding of the basic knowledge.

However, to really excel it is imperative that the specification receives full coverage through the scheme of work that teachers plan and use to deliver the material.

Section B part (d) analysis questions were often very well attempted although candidates did not always include relevant examples to evidence their understanding or extend their answers to justify full understanding of a relevant point.

General comments

Candidates in the main found the three questions in **Section C** accessible with some excellent answers. It is important that centres reiterate that the terms 'develop' and 'range' mean that the candidates should be offering 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 well detailed in some responses.

Evaluation of candidates' initial ideas was often limited in detail and sometimes did not include any of the aspects that were very clearly requested in the question.

Comments on specific questions

Section A

Question 1

- (a) This question was generally, well answered. Most candidates achieved one mark and many gained both marks with 'heat resistant' and 'water resistant' clearly understood.
- (b)(i) There were some good answers that detailed a joint; mitre or finger often named, with the process of gaining an accurate corner generally being understood. Many candidates did use technical terms for the tools and equipment that were being used. Safety precautions were not always included.
- (ii) Candidates were well prepared for this question with numerous responses giving detailed answers with excellent technical details on tools and equipment and how to use them correctly.
- (iii) Several candidates did give good detail within their answers with CAD/CAM for either engraving or adding lettering generally well understood.

Question 2

- (a) Most candidates were able to give the correct size for the envelope.
- (b)(i) Candidates needed to read this question more carefully as many ignored the reference to the 'in quantity' aspect of this question and then lost marks. Where the question was answered well

stencils or templates were often described to aid repeating of the cat shape. Candidates did use technical terms for the tools and equipment that were being used although safety precautions were not always included.

- (ii) This question was answered well with marking out, scoring, cutting out and joining often explained with correctly described tools, equipment, and processes.
- (c) When candidates used correct software, such as Word and then detailed technical terms such as fonts, insert and centring the lettering, answers were generally strong. However, a number of candidates were unable to give such levels of detail and found the question challenging.

Question 3

- (a) This question was generally well attempted with either linear or rotary correctly given.
- (b)(i) There was a significant amount of detail included in lots of responses with the use of heat and a jig to bend the metal being very well understood. However, the hole was often not drilled or threaded in **Part A**.
- (ii) This was a very well answered question with good understanding of the use of a die stock to thread the bar. Tools, equipment, and processes were generally well covered.
- (c) This question was well attempted with Injection Moulding often very well described. However, many candidates did not explain how to make an end cap 500 times and then could not be awarded credit.

Section B

Question 4

- (a) Candidates mostly scored full marks and clearly understood the function of **X**
- (b) Many candidates answered this aspect correctly, identifying several different problems with the design of the child's high chair.
- (c) Most candidates were able to respond to the two problems identified in **part (b)** and use notes and sketches to show how the problems could be overcome. Common answers focused on comfort; padding on the back and seat, missing straps to secure the child safely and also stability/centre of gravity of the high chair. 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; those who understood why the chair was designed to be mass produced gave some detailed responses. Where examples/evidence were used they were generally well linked within the question.

Question 5

- (a) Most candidates understood the function of part **X**.
- (b) This question was generally well answered, with problems identified and clearly explained. Candidates focused on brushes being able to fall out, no access to the brushes and the brush handles not being ergonomically shaped.
- (c) Those candidates who had correctly identified problems and subsequently followed the instructions gave some excellent fully detailed answers that scored full marks.
- (d) Candidates needed to read this question more carefully. Candidates tended to focus on the use of the product when the question did ask for a discussion on why packaging such as the paintbrush set focuses on function rather than aesthetics. Candidates who discussed such issues as low-cost packaging and the visibility of the paintbrushes did score well. Examples were not always given.

Question 6

- (a) Candidates often demonstrated an understanding of what part **X** was but did not always fully justify their answers.
- (b) This was a very well answered question with popular responses explaining the lens hole being very small, no on/off switch, no grip on the body of the torch and also no means of changing a battery.
- (c) Candidates found this section straightforward if **part (b)** had been answered well, often with good diagrams included.
- (d) Most candidates had a basic understanding of why some electric powered products use energy sources other than batteries but for the most part candidates found this question challenging and did not extend their answers or give many examples.

Section C

Question 7

- (a) Candidates gave mostly well-structured answers showing some ideas for a game that used the three ball bearings. Often ideas were very similar and occasionally development was a little limited. The final solution was often realistic with good detail. Evaluation ranged from generic commentary through to some better comments on positive and negative points.
- (b) Candidates offered some good ideas for a carry case for their game.
- (c) Candidates offered some good answers but often the answers were similar in outcome and a number did not indicate how the storage method might attach to the carry case.
- (d) This question was generally well answered with a variety of rendering styles and quality. However, some candidates did not apply any render at all, which impacted the credit they received for their answer. There was evidence of some outstanding responses with many having superb three-dimensional drawings. Some candidates chose to complete this section at the expense of **part (c)**.

Question 8

- (a) Candidates did often produce a range of ideas for the design of a child's painting book including the animal shapes, although the level of detail of the six required pages was often minimal. Three ideas were regularly produced with some candidates showing development. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points.
- (b) Candidates needed to read this question more carefully. Candidates did not always fully address the factors within the question with several generic responses.
- (c) Candidates needed to read this question more carefully. Candidates often produced a range of easy to carry packages for the painting book and holder but did not always include the environmentally friendly aspect.
- (d) Candidates offered a variety of rendering styles and quality. However, some candidates did not apply any render at all, which impacted the credit they received for their answer. There was evidence of some outstanding responses with many having superb three-dimensional drawings. Some candidates chose to complete this section at the expense of **part (c)**.

Question 9

- (a) This was a generally well answered question with most candidates producing a range of ideas for viable solutions. Three ideas were regularly produced with some candidates showing very good development. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points.
- (b) Candidates offered many good answers that detailed imaginative and sensible ways to both attach and adjust the height of the lamp from the ceiling, which were technically very impressive.

- (c) Candidates needed to read this question more carefully. Candidates offered several different and sensible options for a handle but did not always include the ergonomic aspect.
- (d) This question was generally well answered with a variety of rendering styles and quality. However, some candidates did not apply any render at all, which impacted the credit they received for their answer. There was evidence of some outstanding responses with many having superb three-dimensional drawings. Some candidates chose to complete this section at the expense of **part (c)**.

DESIGN AND TECHNOLOGY

Paper 9705/13 Written 1
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Key messages

Sections A and **B** were accessible where candidates had prepared well. Process knowledge was generally good with all three questions in **Section A** being attempted with a clear understanding of the basic knowledge.

However, to really excel it is imperative that the specification receives full coverage through the scheme of work that teachers plan and use to deliver the material.

Section B part (d) analysis questions were often very well attempted although candidates did not always include relevant examples to evidence their understanding or extend their answers to justify full understanding of a relevant point.

General comments

Candidates in the main found the three questions in **Section C** accessible with some excellent answers. It is important that centres reiterate that the terms 'develop' and 'range' mean that the candidates should be offering 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 well detailed in some responses.

Evaluation of candidates' initial ideas was often limited in detail and sometimes did not include any of the aspects that were very clearly requested in the question.

Comments on specific questions

Section A

Question 1

- (a) This question was generally well answered. Most candidates correctly named polypropylene as a suitable material and then often gave easy to work with or aesthetics as a reason for their choice.
- (b) (i) There were some very clearly detailed answers given with marking out, cutting out and assembling covered to achieve an accurate lid. Many candidates used technical terms for the tools and equipment that were being used. Safety precautions were not always included.
 - (ii) Candidates found this question quite challenging in some cases, with the term template being misunderstood. When the template was made correctly it was very well undertaken but detail on how to use it was not always communicated.
- (c) A very well answered question.

Question 2

- (a) Most candidates were able to state two woods with MDF and plywood often given.

- (b)(i) Many candidates answered well including lots of detail on how to mark out, cut out and finish the external and internal shape of the front panel. Candidates used technical terms for the tools and equipment that were being used although safety precautions were not always included.
- (ii) This question was generally very well answered with marking out, cutting out of panels and joints and construction of the drawer explained clearly with notes and sketches. Tools, equipment, and processes were generally well covered.
- (c) Candidates found this question challenging on occasion. Where good answers were seen they included reasons such as flat sheet materials giving less waste due to tessellating the components being cut out and easier transportation.

Question 3

- (a) This question was generally well attempted, with ease of machining and cost effective often given.
- (b)(i) There was a significant amount of detail included in lots of responses with cutting out undertaken with chain drilling or a milling machine. Tools, equipment, and processes were generally well covered as were safety precautions.
- (ii) A very well answered question with good understanding of how the bevel could be cut out and finished. Tools, equipment, and processes were generally well covered as were safety precautions.
- (iii) Candidates that knew this process answered with good detail communicating their knowledge very well.

Section B

Question 4

- (a) Candidates mostly scored full marks with the curved roof allowing water to run off and aesthetic reasons being popular responses.
- (b) Many candidates answered this aspect correctly, identifying several different problems with the design of the cycle storage shed.
- (c) Most candidates were able to respond to the two problems identified in **part (b)** and use notes and sketches to show how the problems could be overcome. Common answers focused on the cycle storage shed being too low to access easily, no visible means of securing bicycles, no anchoring to the ground of the shed and no support for the roof. 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; those who understood the importance of testing and trialling gave detailed answers that covered avoiding mistakes when at production stages and helping to ensure the user or customers were happy with a prototype. Where examples/evidence were used they were generally well linked within the question.

Question 5

- (a) Most candidates understood the function of part **X**.
- (b) Many candidates answered this aspect correctly, identifying several different problems with the design of the laptop stand.
- (c) Most candidates were able to respond to the two problems identified in **part (b)** and use notes and sketches to show how the problems could be overcome. Common answers focused on the laptop stand needing extra support with side webs being added, allowing different heights to be set and the laptop possibly sliding off the stand so needing a stop added. Those candidates who had correctly identified problems and subsequently followed the instructions gave some excellent fully detailed answers that scored full marks.

- (d) Candidates who discussed such issues as recycled card being environmentally friendly, a possible marketing strategy and an aesthetic opportunity did score well. Examples were not always given.

Question 6

- (a) The few candidates that answered this question often demonstrated an understanding of what part **X** was but did not always justify their answers.
- (b) Many candidates answered this aspect correctly, identifying several different problems with the design of the centre lathe.
- (c) Most candidates were able to respond to the two problems identified in **part (b)** and use notes and sketches to show how the problems could be overcome. Common answers focused on the centre lathe not having an on/off switch, or a guard or a chuck. The tool post was also missing. 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 had a basic understanding of why centre lathes have a range of speeds available, but candidates did not always extend their answers or give many examples.

Section C

Question 7.

- (a) Candidates needed to read this question more carefully. Candidates gave mostly well-structured answers showing several designs for the clothes airer. However, some candidates did not include folding flat for storage which did affect their mark. The final solution was often realistic with good detail. Evaluation ranged from generic commentary through to some better comments on positive and negative points.
- (b) Candidates offered some good ideas for a stable base and mostly included how to fold them or reduce size for storage.
- (c) Candidates offered some good answers but more often they were quite generic in design.
- (d) This question was generally well answered with a variety of rendering styles and quality. However, some candidates did not apply any render at all, which impacted the credit they received for their answer. There was evidence of some outstanding responses with many having superb three-dimensional drawings. Some candidates chose to complete this section at the expense of **part (c)**.

Question 8

- (a) Candidates needed to read this question more carefully. Candidates did often produce a range of ideas for the design of pulling or pushing the trolley. There were some outstanding answers that included excellent detail on how their ideas would allow steering as well. However, some candidates did not include the steering aspect. Three ideas were regularly produced with some candidates showing very good development. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points.
- (b) Candidates needed to read this question more carefully. Candidates did not always fully address the factors within the question with a number of generic responses.
- (c) Candidates needed to read this question more carefully. Candidates often produced a range of canopy ideas but did not always include the removal for ease of storage aspect.
- (d) Candidates offered a variety of rendering styles and quality. However, some candidates did not apply any render at all, which impacted the credit they received for their answer. There was evidence of some outstanding responses with many having superb three-dimensional drawings. Some candidates chose to complete this section at the expense of **part (c)**.

Question 9

- (a) This question was generally well answered with most candidates producing a range of ideas for viable solutions. However, some candidates needed to read the question more carefully as they did not always show the one-piece development (net) or a method for opening and securely closing the box. Three ideas were regularly produced with some candidates showing very good development. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points.
- (b) Candidates offered many good answers that showed lettering and graphics in the style of the product.
- (c) Candidates offered several different and sensible options for an insert.
- (d) This question was generally well answered with a variety of rendering styles and quality. However, some candidates did not apply any render at all, which impacted the credit they received for their answer. There was evidence of some outstanding responses with many having superb three-dimensional drawings. Some candidates chose to complete this section at the expense of **part (c)**.

DESIGN AND TECHNOLOGY

Paper 9705/02 Project 1
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Key messages

- The analysis of and research into the Design Brief gives candidates the opportunity to examine the intended use of the product and to collect relevant data. Existing products should also be considered against the needs of the intended user. This information should then be analysed to form the basis of the specification. Some candidates spend unnecessary time listing materials, construction methods, fittings and finishes in their responses to this criterion but this cannot be awarded marks in this section of the assessment scheme. Data shown should relate to the Design Brief and not to any anticipated product outcome.
- The project folder must include clear photographic evidence of the completed model. The photograph(s) should show sufficient detail to support the award of marks for this criterion.

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: lectern, projection stand, ironing board, cake decorating platform, pick-up truck cover, drinks dispenser garden swinging chair, guitar, robot arm, bottle storage, portable barbeque, dart board holder, filing cabinet, tool guide, tricycle go kart, farm trailer, football boot storage, vinyl record storage, card game, skirt, charging dock, desk extender, solar aquaponics, jewellery organiser, greenhouse, picnic cooler box, parking bay, bathtub tray, gym squat rack, watch storage, bicycle parking rack, pop-up animal book, solar lamp, rabbit hutch, rain shelter, chicken drinking system, bicycle maintenance stand, intercom system, bird box, earphone storage, bicycle trailer, water sprinkler, shower head, solar powered fan and automatic pet feeder.

Many design situations resulted in the production of architectural models which were produced to very high standards, realistically representing the proposed buildings.

Comments on specific assessment criteria

Question 1

Identification of a need or opportunity leading to a design brief

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

Many 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 bad features of each.

Specifications were generally well written with very few generic points.

Question 3

Generation and appraisal of design ideas

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 at the time. 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 9705/32 Written 2
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Key messages

- Time management is an issue for some candidates. A significant number of candidates did not fully answer the required number of questions. Practicing timed examinations or questions may help.
- Candidates are reminded to read the question carefully. A significant number of candidates did not focus on key aspects of the question, particularly for **Questions 2, 4 and 6**, and consequently did not access the full mark range for the question.
- When exploring ideas for questions in **Section B**, candidates must evaluate their ideas to give reasons for selection of features or ideas for further development.

General comments

Most candidates complied with the rubric, answering two questions from **Section A** and one question from **Section B**. A significant number of candidates answered only 1 or no questions from **Section A**.

The quality and use of appropriate sketching and annotation was of a good standard throughout the paper. Sketches and notes were used well to support candidate answers to questions, where appropriate, in **Section A** and when designing in **Section B**.

Candidates are reminded that if a question has an instruction 'discuss'; they should:

- examine critically the issues raised by the question
- explain and interpret these issues as appropriate
- introduce evidence wherever possible to support conclusions of arguments.

It would be helpful if this report were read in conjunction with a question paper and mark scheme.

Comments on specific questions

Section A

Part A – Product Design

Question 1

- (a) A wide range of appropriate, specific materials were stated and valid reasons for choice given for the nameplate part of the bracelet. Silver, copper and brass were the most popular responses with valid reasons given.
- (b) A significant number of candidates did not show all the key stages required to manufacture the nameplate and did not access the full range of marks. The shaping of the ends of the nameplate was often not included and some candidates gave no indication of how the name on the face of the nameplate would be created.
- (c) Most candidates correctly described appropriate methods of producing a batch of 500 nameplates. Blanking, stamping and using press formers were the most common correct responses.

Question 2

There were some full and well-structured responses presented to this question. Some candidates needed to read the question more carefully as they produced answers relating to products in general and did not focus on the key part of the statement referring to '...the material informs the form'.

Question 3

- (a) The shaping of the hardwood walking stick handle was answered well by a few candidates, giving full details of the tools and methods required. A number of candidates incorrectly referred to turning as the only process required. This process could not create the shape given.

Most candidates who selected the GRP chute of a slide gave full details of the process of layup.

Candidates generally described full details of a casting process suitable for the manufacture of the metal faceplate. Some candidates described the die casting process but did not include details of the mould required.

- (b) Explanations were generally appropriate although a significant number of responses were very brief bullet point responses with no explanation of why the process was particularly suitable for the item selected.

Part B – Practical Technology

Question 4

Most candidates correctly described four from a linkage, lamination, rack and pinion, ratchet and compound gear train. The compound gear train was the least popular item. Many responses were very brief, lacking the detail of how they were used in a product.

Question 5

Some candidate answers were full and achieved very high marks.

- (a) Some candidates correctly determined the direction and magnitude of the equilibrant force.
- (b) Most candidates had a clear understanding of triangulation. However, many gave very brief responses, lacking detail of how it establishes rigidity in a structure.
- (c) Very few candidates produced a full response to this part.

Question 6

Some candidate responses were of a very high standard.

Whilst most responses had a clear understanding of the impact of the use of computers in general in designing and making; relatively few candidates focused on production and management.

Part C – Graphic Products

Question 7

There were many excellent responses.

Most responses were well drawn planometric drawings, drawn to an appropriate scale. Many candidates included all features of the candidate university accommodation room. However, a significant number did not include all features.

Accuracy and quality of line work were very good.

Question 8

- (a) Most responses were excellent for this part with candidates showing fully detailed cam constructions with correct displacement diagrams. Some candidates incorrectly used uniform velocity for both the rise and fall motion.
- (b) Most candidates named and sketched two other types of follower, roller and flat followers were the most common responses.

Question 9

There was a wide range of responses to this question.

Many candidates introduced and explained a wide range of relevant issues in a logical and structured manner. Most included appropriate examples to support their answer.

A number of candidates produced very brief lists of points with no critical examination of issues or coherence. Information is given at the start of each Part in **Section A**, it is important that candidates fully understand how to approach a question involving the instruction 'to discuss'.

Section B

Most candidates used their time effectively and completed all requirements of the questions attempted.

Whilst some candidates were genuinely innovative and creative, a significant number produced a very limited range of designs of already existing ideas with limited personal interpretation or exploration.

This does not warrant access to the medium or higher mark ranges.

Presentation skills were generally impressive with most candidates demonstrating good knowledge of appropriate materials and construction techniques.

Most candidates generated an analysis fully focused on the problem/situation given. Some candidates produce a generic scatter chart for their analysis that included no or very limited specific reference to the problem. This received little credit.

Specifications are also sometimes generic and cannot help the candidate when evaluating ideas or the final solution.

Most candidates produced a range of different design ideas; a significant number produced two or three single concept sketches. To achieve higher marks candidates would benefit from exploring and evaluating ideas in more detail, including different material possibilities, aesthetic considerations, experimentation with proportions etc. before going onto the next concept.

Some candidates included very limited evaluative comment on their ideas and showed limited reasoning for selection for further development. Evaluating when designing helps when making a reasoned judgment on the best solution or features to take forward.

The development of ideas section was generally good for most candidates. A few candidates focused solely on a plan for manufacture. It is important that candidates consider the reasoning and composition of ideas that leads to a single final design proposal.

To achieve the higher mark range candidates must include evidence of their decision making to show the improvements or modifications to their idea/s leading to a final design.

Proposed solutions were generally feasible and appropriately dimensioned and detailed.

Evaluations of the candidate's proposals tended to be very brief, and some candidates incorrectly evaluated their own performance on the question rather than on their final idea. Candidates should describe the positive features and functional details of their proposal, identify possible weaknesses, and suggest further modifications or improvements. Copying out their specification points and using a tick chart will not access the full range of marks available.

Question 10

Some candidates needed to read this question more carefully. Most candidates designed a water vehicle. However, some did not consider the need for the water vehicle to be self-propelled.

Acceptable specification points included:

- the water vehicle must be made from weather resistant materials or be suitably protected as it will be used on water
- the water vehicle must be stable in the water so that visitors are safe, and the water vehicle will not wobble excessively or tip over
- the water vehicle must have suitable seating to ensure comfort and enable the visitors to propel the water vehicle easily.

The majority of candidates produced a range of possible solutions. Some were innovative and reflected the theme of the wildlife amusement park. Many candidates incorrectly included motorised units to propel the water vehicle.

The final proposals were generally realistic but supporting detail was often limited. Very few candidates included key dimensional details.

Relatively few candidates identified the strengths and weaknesses of their proposal. Some candidates copied out their specification points, which were mostly generic, and used a tick chart to evaluate their final proposal. This will not access the full range of marks available. Candidates should identify strengths and weaknesses and propose possible improvements and modifications.

Question 11

There were a number of high-quality responses to this question. Most candidates generated feasible ideas for a stand/device to support a light; few candidates focused on the light as an integrated unit.

Most designs would connect securely to a bench and were adjustable for height and direction. Some candidates produced designs for the light as an integral part, showing a good understanding of mechanical and electronic components. Many candidates referred to a light source but gave very limited detail of function, attachment or control of the light.

Acceptable specification points included:

- the adjustable light should be securely fixed to focus illumination and not move or swing out of position
- the adjustable light should be easily attached and detached from the bench without strain
- the light should be safely connected to a power source without snagging or catching.

Question 12

Most candidates produced a name and logo for the game, and designed packaging that would be easy to carry. Some of the work produced was innovative and exceptionally well presented.

Candidates used different approaches to this question. Some focused on each of the separate requirements, the name, the logo and the packaging and brought the selected ideas together during development. Most candidates incorporated all requirements into whole concepts with appropriate variations of each concept. Both methods worked well.

Names and logos were particularly innovative from most candidates, a few candidates produced exciting and imaginative proposals for the packaging.

Acceptable specification points included:

- the name and logo should reflect the game of skittles and be simple and exciting to attract customers, could include focus on movement and/or collision
- if the skittles and ball are made from hardwood, the packaging must be of strong construction to hold all components
- the packaging should be able to be used regularly, an easy and effective method of opening and securing the components is required.

DESIGN AND TECHNOLOGY

Paper 9705/33
Written 2

Key messages

- Candidates are reminded to read the question carefully. A significant number of candidates did not focus on key aspects of the question, particularly for **Questions 1, 3, 11 and 12**, and consequently did not access the full mark range for the question.
- When describing a process that requires a mould e.g., Die casting or injection moulding, it is important that details of the mould required are given in the answer.
- In **Section B**, some candidates would have benefited from giving greater consideration to aesthetic and ergonomic detail when designing, as well as manufacturing possibilities when designing.

General comments

Candidates followed the rubric correctly and the majority used the time available to make full attempts at all of their chosen questions.

Most candidates continue to make very good use of appropriate sketching and annotation to support their answers to questions in **Section A** and when designing in **Section B**.

Questions requiring the candidate to 'discuss' were mostly full and detailed. Some candidates produced brief responses, many using a list or bullet points which is an inappropriate way to present an answer for this type of question.

In **Section B**, candidates should be reminded to focus their analysis on the design situation and not produce a chart of generic points to consider. Specifications were generally clear and justified, stating the main functions and requirements of the product.

It would be helpful if this report were read in conjunction with a question paper and mark scheme.

Comments on specific questions

Section A

Part A – Product Design

Question 1

This question had a wide range of responses. A few candidates produced answers for all three parts of the nutcracker. Most candidates selected the body of the nutcracker.

- (a) A good range of appropriate, specific materials were stated and valid reasons for choice given for the body of the nutcracker. Most candidates gave valid reasons for their choice.
- (b) Most candidates fabricated the leaflet holder, the sharp edges of the leaflet holder shown in Fig. 1.1 would suggest that fabrication would be most suitable. Bending and folding were also awarded credit.
- (c) Most candidates changed materials and many selected die casting and injection moulding as a method of manufacturing 1000 parts. A significant number of candidates described the process correctly but did not include details of the mould required to create the selected part.

Question 2

- (a) Compression moulding and profile forming were the most popular choices. Most answers were detailed with many candidates demonstrating a good knowledge of the processes stated.

Many of the candidates who selected case hardening of the steel sleeve described the hardening process and not case hardening.

Some candidates described the process of compression moulding for the handle of the pan lid but did not give details of the mould required.

Profile forming was generally described in detail. However, some candidates did not include to rounded top edge.

- (b) This part was generally answered well. Most candidates gave detailed and relevant explanations as to why the process selected was particularly suitable for producing the item.

Question 3

Some candidate responses to this question were well structured. They covered a wide range of issues, using relevant examples as evidence to support their answer. A strong awareness of global concern over dwindling resources and problems of wastage was very evident.

Some candidates needed to read this question more carefully as they did not consider the implications to both the manufacturer and the consumer.

Part B – Practical Technology

Question 4

- (a) Most candidates correctly described methods of temporarily and permanently joining the handle to the pan.
- (b) Most candidates suggested two methods of manufacturing a frying pan as a one-piece product, very few compared and contrasted the methods.

Question 5

- (a) Most candidates correctly defined plasticity and toughness.
- (b) Most candidates stated a correct material.
- (c) Very few candidates described an appropriate test for toughness. A basic, measurable impact test would have been suitable.
- (d) Some responses were fully detailed showing a clear understanding of Young's Modulus with reference to the designing of products. Very few candidates attempted this part.

Question 6

- (a) (i) Candidates correctly named components **X** and **Y**.
- (ii) Candidates correctly named component **Z** and completed a truth table for the component.
- (iii) Some candidates fully described how the circuit operates.
- (b) Very few candidates made an attempt at this question part.

Part C – Graphic Products

Question 7

Most candidates drew the incomplete orthographic views of the cone and intersecting sphere but did not go on to construct the lines of intersection.

Some candidates produced incomplete developments.

Question 8

- (a) Most candidates gave two appropriate examples to demonstrate the influence of fashion and style on the design and manufacture of products. Some candidates gave broad descriptions of fashion and style but did not provide specific examples as required by the question.
- (b) This part was answered well. Focus groups and online questionnaires/surveys were the most common correct ways given.
- (c) Most responses were full and detailed for this part. Many referred to their own experience, researching for their coursework project.

Question 9

There were many excellent responses to this question. Most candidates produced a well-structured discussion, including a range of critically examined, relevant issues. Most candidates made excellent use of examples to support their answers.

The majority of candidates made full reference to the importance of packaging to both the manufacturer and consumer.

Some responses were very limited, presented as a list of points with no further examination or analysis.

Section B

Section B was generally answered well by most candidates. The majority fully completed each of the sections required although a significant number did not produce an evaluation of their final proposal.

The analysis and specification sections were particularly strong from this cohort.

Candidates applied different approaches to the exploration of design ideas. Some produced at least three imaginative initial concepts, each explored in detail, with features evaluated and modified where appropriate. A significant number of candidates investigated different requirements of the product and compiled proposals after this initial exploration. Both methods are appropriate if candidates show evidence of a wide range of possibilities and annotate and evaluate accordingly. Some candidates would have benefited from giving greater consideration of aesthetics and ergonomics as well as detail for manufacture when designing.

Whilst many candidates demonstrated a good knowledge and understanding of appropriate materials and construction techniques in their designs, a significant number did not include details of appropriate materials or possible methods of construction.

Clear design decision making was evident in the work of some candidates in the development section. Many focused solely on describing the method of manufacture and did not include sufficient detail of the reasoning and composition of ideas that lead to the single final design proposal.

Proposed solutions were mostly feasible and detailed, including important dimensions and specific features such as materials and finishes.

Many candidates produced a valid evaluation of the proposed solution based on their specification, describing the strengths and weaknesses, and suggesting possible improvements.

A significant number of candidates did not produce a specification.

Question 10

Most candidates fully considered the given design requirements for the rocking toy. The majority of candidates produced feasible, functional products. Some responses included very imaginative and creative possibilities. A number of candidates did not consider the requirement for the rocking toy to be easily assembled and disassembled.

Work was generally well presented and easy to follow. Most candidates gave details of appropriate materials and methods of construction.

Most candidates demonstrated clear design thinking and reasoning of their ideas into a single design proposal in their development. A significant number focused too heavily on how the product would be constructed.

Final proposals were generally functional, and drawings were detailed including key dimensions.

Evaluations were generally good. Some evaluations had limited comment on the strengths and weaknesses of the proposal. A number of candidates did not complete an evaluation.

Acceptable specification points included:

- the rocking toy must have a good factor of safety to ensure that the toy does not topple over
- the rocking toy must be made from materials that can be easily washed for hygiene purposes
- the rocking toy be quick and easy to assemble and disassemble but be secure when assembled.

Question 11

Most responses were functional in terms of holding a magnifying glass at different angles; many candidates did not include details of providing illumination.

Material and constructional proposals were appropriate.

Many drawings of the final proposal lacked detail, for example, how the product functioned or key dimensions.

Acceptable specification points included:

- the product should be easy to adjust and secure in place to ensure no slippage
- the product must have a stable, weighted base for it to be freestanding with minimal movement when in use
- the product should present no risk to candidates, trapping fingers etc.

Question 12

There were some outstanding responses to this question. Some candidates produced a range of innovative ideas for the name and shape of the new biscuit, the packaging and viable promotional items. A significant number of candidates did not consider the promotional item.

Some candidates applied a wider interpretation of packaging and developed excellent ideas for packaging that could be used for storage of biscuits or other items.

The analysis and specification sections were mostly detailed and appropriate.

Candidates used different approaches to this question. Some focused on each of the separate requirements, the shape and name, the packaging, and the promotional item. They then brought the selected ideas together during development. Most candidates incorporated all requirements into whole concepts with appropriate variations of each concept. Both methods worked very well.

Many candidates included different developments/nets for the packaging, some having handles designed in, others designed to attach string or plastic handles. The designs for the product name and logo were in most cases of a very high standard.

Many candidates produced work where the design thinking and decision making was clear from analysis through to proposed solution.

Acceptable specification points included:

- the new shape of biscuit should not be too intricate as it may break
- the name, logo and packaging could have an educational purpose, include planets or historical space events
- the packaging should be able to be re-used, either for storing biscuits or other items.

DESIGN AND TECHNOLOGY

Paper 9705/04
Project 2

Key messages

- The Product Realisation is a significant part of this project so it is important that the design folder includes photographic evidence of the made product, where possible, in use. The images should include sufficient detailed evidence to support the marks awarded for this criterion.
- It is important that candidates consider all design specification points when responding to the Generation and Appraisal of Design Ideas. This can either be ongoing or as a summary when comparing ideas and making a final choice.

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: lectern, projection stand, ironing board, cake decorating platform, pick-up truck cover, drinks dispenser garden swinging chair, guitar, robot arm, bottle storage, portable barbeque, dart board holder, filing cabinet, tool guide, tricycle go kart, farm trailer, football boot storage, vinyl record storage, card game, skirt, charging dock, desk extender, solar aquaponics, jewellery organiser, greenhouse, picnic cooler box, parking bay, bathtub tray, gym squat rack, watch storage, bicycle parking rack, pop-up animal book, solar lamp, rabbit hutch, rain shelter, chicken drinking system, bicycle maintenance stand, intercom system, bird box, earphone storage, bicycle trailer, water sprinkler, shower head, solar powered fan and automatic pet feeder.

Many design situations resulted in the production of architectural models which were produced to very high standards, realistically representing the proposed buildings.

Comments on specific 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. However, 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.

Question 6

Product planning

Many candidates successfully fulfilled 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

It could be seen that candidates had developed 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.

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.

Candidates need to produce more than a list of the specification points and then complete a tick box alongside when it is felt that a particular requirement has 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.