

# DESIGN AND TECHNOLOGY

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| <p><b>Paper 9705/11</b><br/><b>Written 11</b></p> |
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There were too few candidates for a meaningful report to be produced.

# DESIGN AND TECHNOLOGY

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Paper 9705/12  
Written 12

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 within the question or did not 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 often answered well. Process knowledge was good with all three questions in **Section A** being attempted with a clear understanding of the basic knowledge. Occasionally health and safety points that candidates added were irrelevant to the process and were simply generic. Candidates generally found the three questions in **Section C** accessible with some good answers given.

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 requested in the question.

## Comments on specific questions

### **Section A**

#### **Question 1**

- (a) Generally, this was answered well. Most candidates could explain why the hole in the elephant was drilled before the body was cut to shape.
- (b)(i) Stronger answers clearly detailed marking out and drilling the hole in Part **A**. Many candidates used technical terms for the tools and equipment used with many excellent diagrams. Safety precautions were often included.
- (ii) This question was usually answered well with candidates understanding the steps necessary to mark out and cut Part **A** to shape. There were some excellent responses that demonstrated very good subject knowledge.
- (c) This was a very well answered question with candidates demonstrating a good knowledge of how to make two identical ears. There were some very good responses that detailed how using a template or clamping the two parts enabled a more accurate outcome. Attaching the ears to the elephant was occasionally not undertaken.

#### **Question 2**

- (a) Most candidates were able to correctly explain at least one reason why Styrofoam is a suitable material for the model of the hairdryer. Styrofoam being easily cut and shaped and having the ability to be painted were popular answers.

- (b)(i) Generally, this question was answered well with candidates understanding how to make the handle from a sheet of 20 mm Styrofoam. Marking out, cutting and finishing techniques were all well communicated but some candidates did not recognise that two sheets needed to be stuck together to give the overall thickness of the handle.
- (ii) Candidates had a good understanding of how to smooth the model and apply a paint finish. However, some candidates decided to apply an aerosol spray finish which was incorrect.
- (c) Candidates had a good understanding of how to make and apply the monochrome sticker. The use of various design packages to design on computer and then print in batches was a very popular response.

### Question 3

- (a) Most candidates were able to explain why Part **B** is knurled.
- (b) Candidates were generally able to explain how to cut an M8 external thread on Part **A** with technical terms for tools and equipment accurately communicated.
- (c) Candidates found being able to show the difference between clearance, blind and internally threaded holes very challenging.
- (d)(i) Candidates found it very challenging to describe motion conversion in the toolmakers clamp.
  - (ii) Some candidates understood the use of mechanical advantage, with the use of a tommy bar or a similar principle being the most popular 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 outdoor game.
- (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 base and stability issues, the bails not staying on the wicket or chipboard absorbing moisture. Candidates who had correctly identified problems and subsequently followed the instructions gave excellent fully detailed answers that scored full marks.
- (d) Candidates gave a broad range of well thought out answers relating to their understanding of why manufacturers of products work to a detailed design specification. Consistent product performance, quality control and the use of materials were regularly clearly detailed. Examples were not always given.

#### Question 5

- (a) Some candidates understood the function of **X**.
- (b) Some candidates answered this question correctly, identifying at least one problem with the design of the box of tissues or the protective cover.
- (c) If candidates were able to identify two problems in (b), then they were able to use notes and sketches to show how the problems could be overcome. Common answers focused on the incorrectly shaped cover as it would not be suitable for vacuum forming, package and cover sizing were not compatible or the incorrect development (net).
- (d) Some responses to this question regarding why designers of packaging model their ideas before selecting one to fully develop were very clear. Candidates who discussed issues such as allowing new ideas to be trialled, models used to gain user feedback or giving three dimensional views of the product answered well. Examples were occasionally given.

### Question 6

- (a) Most candidates were able to explain feature **X**.
- (b) Most candidates managed to identify several different problems with the design of the bench mounted bandsaw.
- (c) Candidates found this question straightforward if **b** had been answered well. They often included good diagrams with no blade guard, no means of fastening the bandsaw to the bench or no cutting guide being well communicated.
- (d) Candidates often had a good understanding of why manufacturers of electrical appliances provide safety information and operating instructions. Health and safety considerations in terms of people injuring themselves, incorrect use and associated risks or damage to manufacturers' reputations if appliances are incorrectly used were well explained, with some realistic examples.

### Section C

#### Question 7

- (a) Most candidates gave well-structured answers showing ideas for a display unit for clothing. Often ideas were very similar and occasionally the need for the unit to rotate 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 of their designs.
- (b) Candidates offered a wide variety of answers on designs for a rack for socks that fits on the display unit. There were often several ideas but on occasion they were very similar in design.
- (c) Candidates offered some good answers for a sign holder to fasten to the rack but the requirement to easily change the A4 sign was often not included.
- (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) Candidates were able to design a one-piece card development (net). Three ideas were sometimes produced with some candidates showing development. Often ideas were very similar and occasionally the need to deposit and remove coins was not shown. Evaluation was often generic. Some candidates did not include the development (net).
- (b) Most candidates presented a good range of different ideas for the design for graphics for the collection box. Three ideas based on the name 'Haven' were usually produced.
- (c) Candidates were able to offer a range of different ideas for a low-cost promotional item to be given to people who donate to the charity. Mass production was also communicated well.
- (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.

#### Question 9

- (a) Candidates often produced a range of ideas for a mechanical device to propel the ball bearing. Three ideas were usually produced but some ideas were very similar. Stronger answers demonstrated a full understanding of how to propel the ball bearing and fit it into position **A** on the game with lots of detailed and technical responses. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points.
- (b) Candidates answered this question well and often presented a good range of different ideas for the design for preventing the ball bearing going through the 100 mm wide gap and then propelling it

towards the cups. Three ideas were usually produced with paddle style flippers being popular and realistic outcomes.

- (c) Candidates generally found it challenging to develop a range of ideas for a device that would give a visual or audible warning when the ball bearing comes to rest in one of the cups.
- (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.

# DESIGN AND TECHNOLOGY

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Paper 9705/13  
Written 13

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 within 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 often answered well. Process knowledge was good with all three questions in **Section A** being attempted with a clear understanding of the basic knowledge. Occasionally health and safety points that candidates added were irrelevant to the process and were simply generic. Candidates generally found the three questions in **Section C** accessible with some good answers.

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 requested in the question.

## Comments on specific questions

### **Section A**

#### **Question 1**

- (a) Generally, this was answered well. Most candidates could explain the function of Part **A** with the improvement in structural integrity being part of many responses.
- (b)(i) Stronger answers clearly detailed marking out, cutting, whether by hand or with a machine, and sanding the slats. Many candidates used technical terms for the tools and equipment used. Safety precautions were often included. However, some candidates did not include any details on creating the chamfer.
- (ii) This question was usually answered well with candidates understanding the steps necessary to mark out and fasten the six slats to the cross rails. There were some excellent responses that detailed the use of spacers or a jig to set out the 6 mm gap.
- (c) This was a very well answered question with candidates demonstrating a good knowledge of how to mark out, drill and join Part **B** to Part **C**. There were some very good responses that detailed how using a jig or clamping the two parts enabled a more accurate outcome.

#### **Question 2**

- (a) Most candidates were able to correctly give at least one reason why corrugated card had been used for the package, with providing a smooth, rigid surface, having protective qualities and being easily cut all popular answers.

- (b) Generally, this was a very well answered question with candidates understanding how to show the shape of the one-piece development net which included fold lines, cut outs and the correct number of surfaces.
- (c) Candidates had a good understanding of how to make the paper label and attach it to the package. The use of various design packages to design on computer and then print in batches was a very popular response.
- (d) Candidates were able to name a specific plastic for the clip. However, some candidates did not give a suitable process to make a batch of 5000 clips. When injection moulding was given as an answer, candidates tended to score very well indeed.

### Question 3

- (a) Most candidates could give at least one reason for using string in the model of the pulley system.
- (b) (i) Candidates were generally able to explain how to make Part A, with the use of a strip heater for folding up the acrylic housing being regularly stated.
  - (ii) Candidates gave a variety of different responses for making one aluminium pulley wheel. The most popular correct responses were sand casting or the use of a laser cutter to cut out three disks which were then connected together.
- (c) (i) Candidates found it very challenging to describe reciprocating, liner and rotary motion in the pulley system.
  - (ii) Some candidates understood the use of mechanical advantage but generally this proved a challenging question.

### 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 chair.
- (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 lack of stability, Styrofoam being a weak material for the seat, extra support being required and chipboard being unsuitable for steam bending. Many candidates who had correctly identified problems and subsequently followed the instructions gave excellent fully detailed answers that scored full marks.
- (d) Candidates gave a broad range of well thought out answers showing their understanding of how manufacturers of mass-produced products can reduce unit costs. Materials being bulk purchased, sharing tooling costs across many products, automation and the reduction in labour costs were often well communicated. Lego was a very well communicated example. 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 storage rack.
- (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 incorrectly shaped connector slots, inconsistent sizing of the shelf and ends and issues with painting acrylic. Most candidates who had correctly identified problems and subsequently followed the instructions gave excellent fully detailed answers that scored full marks.

- (d) Candidates often answered this question about the functionality of a product being more important than aesthetics well. Stronger answers included issues such as the extra costs of designing aesthetic considerations, some functional safety products or those that are not on display not needing to have any aesthetic impact, as well as functionality being the basis of all products. Examples were occasionally given.

#### Question 6

- (a) Most candidates were able to explain feature X.
- (b) Candidates usually managed to identify several different problems with the design of the electric food mixer.
- (c) Candidates found this question straightforward if (b) had been answered well. Candidates often produced good diagrams including the mild steel whisks, the unsecured glass bowl and no controls being good responses.
- (d) Candidates often had a good understanding of why manufacturers of electrical products design them to be energy efficient, with reduction of impact on the environment and sustainability being very popular answers.

#### Section C

#### Question 7

- (a) Candidates generally produced well-structured answers showing ideas for bathroom storage. Often ideas were very similar and occasionally the need for the unit to be fastened to a wall was a little limited, but the mirror was very well communicated throughout. 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 of their designs.
- (b) Candidates offered a wide variety of answers for incorporating two glass shelves in the bathroom storage unit. There were often several different ideas for making them adjustable.
- (c) Candidates offered some good answers for holding a towel, with hooks, poles, rails and shelves all regularly communicated.
- (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) Candidates often produced a range of imaginative ideas for a development (net) for a package to hold six cartons of fruit drink. Three ideas were usually produced but some ideas were very similar. Stronger answers demonstrated a full understanding of how to construct a development (net) with some detailed and technical responses. Evaluation ranged from generic commentary through to some excellent annotation of positive and negative points. However, some candidates did not show development nets and just focused on the three-dimensional shape of the packaging.
- (b) Candidates often presented a good range of different ideas for the design for graphics on the front of the package. Three ideas were usually produced but on occasion the name 'Fruitee' was not included.
- (c) Candidates generally produced a very good range of ideas for a game to go on the back of the packaging for children 4 – 5 years of age. Stronger answers gave some excellent ideas that were both realistic and creative and linked the age range very well. There were some outstanding responses to this question.
- (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) Candidates were able to design a lightweight structure. Three ideas were sometimes produced with some candidates showing development. Often ideas were very similar and occasionally the need for the structure to be assembled without the use of tools was limited. Evaluation was often generic.
- (b) Candidates were able to offer several ideas for a food tray to attach to the structure designed in (a), but adjustability was not always included.
- (c) Candidates found it challenging to offer a range of different ideas for a lighting system that was not powered by mains electric for the garden shade designed in (a). LED lighting from solar panels or battery powered were common responses.
- (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.

# DESIGN AND TECHNOLOGY

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| <p><b>Paper 9705/02</b><br/><b>Project 1</b></p> |
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## **Key messages**

- Candidates are advised not to spend unnecessary time listing materials, construction methods, fittings and finishes in their responses to Analysis of and Research into the Design Brief as this cannot be awarded marks in this section of the assessment scheme. Data and information shown should relate to the Design Brief and not any anticipated particular product outcome.
- It is important that candidates take into account and refer to all their design specification points when responding to the Generation and Appraisal of Design Ideas.

## **General comments**

Candidates had developed a keen interest in their Design and Technology project work. In addition to the usual range of household items or architectural models, interesting outcomes included: dog feeding station, dog housing, jewellery organiser, phone charging station, wall mounted folding table, key storage, hairdresser's chair, rotating stationery caddy, medal storage and display, automatic animal feeder, ski carrier, travel case, water bottle holder, homeless housing, sailboard storage, rubbish bin, wheelchair accessories, car litter bin, battery inverter, chair for the disabled, laptop stand, make-up storage.

Centres are reminded of the requirement to include detailed photographic evidence of the model produced for Project 1 in whatever form it may take.

## **Comments on Individual Assessment Criteria**

### **Question 1**

#### **Identification of a need or opportunity leading to a design brief**

Most candidates made it very clear how their chosen design problem linked to both the potential user and the situation. This was then supported by a precise design brief leaving the reader in no doubt as to the intended design route being followed.

### **Question 2**

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

It is essential that there is a thorough analysis of the actual design problem being undertaken so as to give direction to the identification and collection of relevant data. This is a very important part at this stage of a design process as it provides information from which an accurate and meaningful Specification can be formulated.

Most candidates considered a wide range of existing products and commented on these in relation to their own design brief.

Specifications were generally well formulated and included many specific requirements of the product to be designed. It is important to exclude generic statements here.

### **Question 3**

#### **Generation and appraisal of design ideas**

Many candidates showed a high degree of flair in the creation of ideas. Some candidates presented a range of drawings not linked to the Specification or not commented upon regarding their possible suitability for the problem being considered. In these cases, it is not possible to award marks above the lowest band set out in the assessment scheme.

The importance of presenting a wide range of different ideas, however practical they may appear at the time, cannot be understated and these should then be considered against the Specification with some form of written appraisal. Where ideas have touched on aspects of the Specification then these should be commented on or highlighted in some way.

Many candidates demonstrated a wide range and high standard of communication techniques when presenting their design proposals. Where care is taken in this respect then it is easy to see how a candidate's thought process has developed.

### **Question 4**

#### **Modelling of ideas**

Modelling should be seen as one stage of the consideration, testing and evaluation of design ideas so that a final design can be presented and subsequently developed, perhaps in Project 2. Many candidates produced high quality and meaningful models that formed part of this process whereas others simply produced a mock-up of the chosen design idea, and it was sometimes difficult to identify how it made a contribution to the design process.

More candidates are modelling different aspects of their design ideas and using these to test for suitability and practicality in the production of a complete solution to their design problem. In this way the modelling stage plays a more meaningful part in designing.

# DESIGN AND TECHNOLOGY

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Paper 9705/32  
Written 32

## Key messages

- It is important that when answering a question with the instruction 'discuss', candidates ensure that they produce a clear and well-structured response. Bullet point responses or lists of points are not appropriate. Candidates may benefit from producing a brief plan of key issues to include and should consider possible examples to refer to in their answer.
- Candidates should carefully plan the use of the time available in the exam. A significant number of candidates did not fully comply with the instructions and answered only one or two questions in total. Some did not fully complete their response to the **Section B** question.
- Single word or very brief responses, such as 'quick' or 'accurate', when answering questions requiring the candidate to explain will not gain credit. Candidates must clearly explain why the chosen process is particularly suitable for the production of the chosen item.

## General comments

There were a number of full and detailed responses to **Section A** and well-presented and imaginative responses to **Section B**.

Most candidates made very good use of clear sketches and notes to support their answers when required in **Section A**. A few candidates did not use sketches when required to do so and consequently could not be awarded full marks.

In **Section B**, candidates should be reminded to focus their analysis of the design situation and not copy out the given details. Many candidates produced generic charts for the analysis. There must be reference to the given situation for credit to be awarded.

## Comments on specific questions

### **Section A**

#### **Part A**

#### **Question 1**

- (a) The process was usually well described. However, some candidates did not recognise that the hatched area was the hole to be cut out. Some candidates focused almost entirely on the marking out of the shape to be cut out and did not include key processes required to access the full mark range.
- (b)(i) Many candidates stated the types of finish but did not make any comparison.
- (ii) This question was generally well answered.

#### **Question 2**

Some responses were well-structured and detailed, focussing on the key elements outlined in the question. Many candidates focused almost entirely on aesthetic features and did not access the full mark range. Some candidates incorrectly included all three products given in their response.

Candidates should present their answer as a structured and clear response where they examine critically the issues raised by the question, explain and interpret these issues as appropriate and introduce evidence wherever possible to support conclusions of arguments.

### Question 3

Most candidates selected the parasol base and the aluminium casting.

- (a) Candidates made very good use of clear sketches and notes in this question. The process of rotational moulding was generally well described with most candidates correctly showing that rotation was in all directions to facilitate an even coating. However, relatively few candidates attempted to explain the process for turning the board game piece. Most described the lathe to be used but very few referred to the correct cutting tools or chisels required for the task. The process of die casting was well explained by many candidates but a significant number incorrectly explained a sand casting method.
- (b) Many candidates did not explain in sufficient detail why the process was particularly suitable for the production of the item.

### Part B

### Question 4

Some answers to this question were of a very high quality, fully detailed and clearly presented, and achieved very high marks

- (a) (i) Most candidates named an appropriate material. Copper and brass were the most common responses.
- (ii) The most popular method of manufacture was rolled/formed cylinders for the top and base, with circular cut shapes joined by hard/silver soldering. Many candidates made the top from turned hardwood.
- (b) (i) Most candidates named an appropriate plastic.
- (ii) Most candidates described the process of injection moulding which would be appropriate for manufacturing a batch of 5000 gift boxes. Few candidates gave clear detail of the mould to be used. 3D printing systems were proposed by some candidates as these are capable of producing batch quantities. Only a few candidates produced sufficient detail of the process to achieve the higher mark range.

### Question 5

Most candidates identified methods of product testing but not all went on to explain in detail why they were used and the importance to both the manufacturer and the consumer. Some answers were presented as lists of points rather than with the required clarity and structure.

### Question 6

Very few candidates made attempts at all four properties listed.

- (a) The significance of brittleness and corrosion resistance were correctly explained by most candidates, with appropriate examples referred to. Some candidates explained the significance of electrical conductivity with an appropriate example. Plasticity was not well understood.
- (b) Very few candidates went on to attempt (b).

## Part C

### Question 7

- (a) Some candidates incorrectly redrew the base and drill guide given in **Fig. 7.1** in isometric projection to a correct scale. The sectional view was correctly drawn by most candidates but there were very few correct attempts to draw an elevation from the direction of arrow **B**.
- (b) Most candidates correctly included four dimensions to the sectional elevation. Not all candidates drew a correct projection symbol.

### Question 8

Some candidates produced full, well-structured answers, covering an appropriate range of issues and introducing appropriate examples and evidence to support their arguments.

Some responses focused on reducing the cost of materials and production without consideration of the possible impact upon quality and market desirability.

### Question 9

- (a) Some candidates produced a very high quality two-point perspective drawing of the assembled mobile phone holder. Some candidates did not render the drawing or use thick and thin line technique to enhance the drawing.
- (b) Very few responses included appropriate detail of how designers use different two-point perspective views.

## Section B

Whilst most candidates fully completed all requirements to their selected question from **Section B**, a significant number did not produce a proposed solution and an evaluation.

Some responses were very strong with well-presented and innovative work showing a natural progression of design and development. However, many candidates produced generic, single word responses for their analysis. Some candidates copied out given details for their specification and did not include additional specification points stating the main functions and qualities of the product. Candidates should focus their analysis on the given design situation and include clear reference to the situation both in their analysis and specification.

The inclusion of details of appropriate materials and construction method was clearly evident in the exploration and development areas in most responses. Some candidates focused only on the manufacture of the proposed solution in their development and had limited evidence of the reasoning and composition of ideas into a single design proposal.

Candidates generally provided clear details of their proposed solution. Key dimensions, materials and components used and finishes applied were evident in most candidate responses.

Many final evaluations were limited and lacking appropriate detail and some candidates produced a tick list against the initial specification with very limited or no explanation or justification. However, some candidates produced detailed evaluations of their proposal, describing the positive features and functional details and suggested possible modifications or improvements. Some used sketches to show possible improvements, which is to be encouraged.

### Question 10

There were some very high-quality responses to this question. Some candidates explored a good range of creative possibilities and included impressive all-round knowledge of materials and construction. Design decision making was generally good, enabling candidates to arrive at a very creditable solution. Initial ideas tended to be very similar for some candidates and showed little in the way of innovation. A significant number of responses did not fully address the design brief, e.g. the need for portability. Selection of an idea was not clearly evident in many candidates' work. Some used a scoring or points system with limited or no justification or evaluation.

Final proposals were generally functional and well-presented with appropriate detail of functions, dimensions, materials and components used and finishes applied.

Acceptable specifications included:

- the unit must be easily fixed in position and secured to ensure safe usage
- any securing mechanisms should be easy to operate and not require too much pressure
- the unit should be easy to fold away for storage
- the unit could have the additional function of holding pens and other stationery equipment that may be used
- the unit could have a method of holding a large enough umbrella in case of sudden rain.

### Question 11

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 and many ideas had detailed mechanical and technical features.

Most responses were feasible and considered all requirements of the question. However, some candidates had limited evidence of the mechanical and technical requirements of steering or propelling a vehicle.

Acceptable specifications included:

- the ride-on toy must not require excessive effort to propel as it is to be used by 5 – 11-year-old children
- the ride-on toy should have a soft bumper or covering to prevent harm to others in an accidental collision
- the ride-on toy should have a braking system to avoid harm or danger
- the ride-on toy should be comfortable to sit on and allow the rider to easily control the toy vehicle
- the ride-on toy could have a horn or alarm to alert others and lights to look more realistic.

### Question 12

Many candidates presented very imaginative ideas for the name and logo and some also explored innovative methods of packaging, fully considering the requirement to be reusable. However, a significant number of candidates focused on one concept for the packaging with limited consideration of the different shapes of the three components.

Acceptable specifications included:

- the packaging should allow easy access to each of the three components and a securing method to store the components after use
- the packaging should be robust and well made to store the three components for regular use over a number of years
- the name and logo should be linked with the theme of solar lighting, possibly exploring eco credentials
- the packaging should have a simple carrying handle as all three components may take up a lot of room
- the packaging should include some form of protection as the solar charger would be fragile.

# DESIGN AND TECHNOLOGY

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Paper 9705/33  
Written

## Key messages

- It is important that when answering a question with the instruction 'discuss', candidates ensure that they produce a clear and well-structured response. Bullet point responses or lists of points are not appropriate. Candidates may benefit from producing a brief plan of key issues to include and consider possible examples to refer to in their answer.
- Single word or very brief responses such as 'quick' or 'accurate', when answering questions requiring the candidate to explain will not gain credit. Candidates must clearly explain why the chosen process is particularly suitable for the production of the chosen item.
- Specifications for **Section B** responses should be clear and should include justified statements detailing points relating to what the product needs to do, looks like and perform as required for the end user.

## General comments

There were a number of full and detailed responses to **Section A** and well-presented and imaginative responses to **Section B**.

Most candidates complied fully with the instructions, answering two questions from **Section A** and one question from **Section B**. Some candidates did not answer the question selected in **Section B** fully.

The quality of appropriate sketching and annotation was generally of a very good standard. Sketches and notes were used well to support answers where appropriate in **Section A** and when designing in **Section B**.

In **Section B**, candidates should be reminded to focus their analysis of the design situation and not copy out the given details. Many candidates produced generic charts for the analysis. There must be reference to the given situation for credit to be awarded.

## Comments on specific questions

### **Section A**

#### **Part A**

#### **Question 1**

- (a) Acrylic and stainless steel were the most common correct responses but a wide range of appropriate materials were stated. Most candidates gave well justified reasons.
- (b) The description of the process was usually fully detailed with most or all key stages included. Some candidates described the use of laser cutting as a method of production, including all necessary stages such as file preparation and machine set-up, to access the full mark range.
- (c) Most candidates explained simple changes to the design of the egg holder and used jigs and templates to produce the batch of 50. Injection moulding was described by some candidates but this process would be inappropriate for such a low batch number.



## Question 2

Some candidates produced fully detailed and well-structured responses, focussing on the key elements of the importance of ergonomics when designing a product. A significant number of candidates referred only to anthropometrics and made very limited or no reference to psychological and physiological aspects.

Some responses were very brief and some were presented as a short list of points. Candidates should present their answer in a structured and clear format where they critically examine the issues raised by the question. They need to explain and interpret these issues as appropriate and introduce evidence wherever possible to support conclusions of arguments.

## Question 3

- (a) Most candidates made excellent use of annotated sketches in their response. The process of riveting was generally well understood. Most candidates gave clear and full details of the specific tools required. However, some candidates incorrectly described the process of pop riveting which would leave an inappropriate finish on a handheld product.

Most candidates had knowledge of the process of laminating a hardwood product but some did not clearly describe the method of holding the laminations in place and did not access the full mark range.

The vacuum forming process of the packaging for yoghurt was generally well answered. Some candidates did not give any detail of the former required.

- (b) Many candidates did not explain in sufficient detail why the process was particularly suitable for the production of the item. Candidates needed to clearly explain why the chosen process is particularly suitable for the production of the chosen item.

## Part B

### Question 4

There were very few responses to this question

### Question 5

There were very few responses to this question.

### Question 6

There were very few responses to this question.

## Part C

### Question 7

This question was often answered well. Most candidates correctly drew the planometric view to an appropriate scale. Some candidates did not include full details of the hotel washroom. Responses were mostly accurate and drawn with good line quality.

### Question 8

There were some excellent responses to this question. There were well-structured answers covering a good range of relevant issues relating to the responsibilities of designers such as architects, craftspeople and engineers and appropriate supporting evidence and examples. Some candidates focused on the roles of the designers and paid little attention to their responsibilities and consequently did not access the full mark range.

### Question 9

There were some very high-quality responses to this question.

- (a) Most candidates correctly drew an accurate, full-size isometric drawing of the assembled scoop and used correct construction technique for the curves and logo.
- (b) Relatively few candidates attempted this part of the question. Generally answers included well detailed descriptions of how a batch of 50 000 scoops would be manufactured using an appropriate image print and die cutting and fold/punch block method.

### **Section B**

Most candidates fully completed all requirements to their selected question from **Section B** but a significant number did not produce a proposed solution and an evaluation.

Some responses were outstanding with well-presented and innovative work showing a natural progression of design and development.

Many candidates produced generic, single word responses for their analysis. Some candidates copied out given details for their specification and did not include additional specification points stating the main functions and qualities of the product. Candidates should focus their analysis on the given design situation and ensure clear reference to the situation both in their analysis and specification.

The inclusion of details of appropriate materials and construction method was clearly evident in the exploration and development areas in most responses. Some candidates focused only on the manufacture of the proposed solution in their development and had limited evidence of the reasoning and composition of ideas into a single design proposal.

Candidates generally provided clear details of their proposed solution. Key dimensions, materials and components used and finishes applied were evident in most candidate responses.

Many final evaluations were limited and lacking appropriate detail and some candidates produced a tick list against the initial specification with very limited or no explanation or justification. However, some candidates produced detailed 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 is to be encouraged.

### **Question 10**

There were some very good quality responses to this question. Most candidates explored a wide range of possibilities with appropriate annotation. There was good consideration of the different requirements of a lectern, such as a holder for a microphone and connectivity to other digital systems to control visual displays and lighting. Selecting an idea for further development was generally good but some candidates used a basic scoring or points system with limited or no justification or evaluation.

Final proposals were generally functional and well-presented with appropriate detail of functions, dimensions, materials and components used and finishes applied.

Acceptable specifications included:

- the lectern must be stable to avoid movement when in use as users often rest their hands on the reading surface
- any securing mechanisms for adjusting height of the lectern should be easy to operate and not require too much effort
- the lectern should be easy to fold away for storage
- the lectern could have the additional function of holding a microphone or other devices to control lighting or supporting digital projections
- the lectern should have a clear image of the school crest or name on the front.

### **Question 11**

No candidates attempted this question.

## Question 12

Many candidates presented imaginative ideas for the name and logo of the new music quiz show and for the TV stage set. Some candidates did not consider a sufficient range of possibilities for the name and logo and focused almost entirely on the design of the stage set. The evaluation of the proposed solution was full and detailed in many responses. However, some candidates produced a tick list against the initial specification with very limited or no explanation or justification.

Acceptable specifications included:

- the TV stage set should allow easy access for camera crews to record from different angles at different times of the quiz show
- the TV stage set should ensure that each team has a clear view of the display screen
- the name and logo should be linked with the theme of music, exploring symbols or words associated with quizzes
- the area for live artists should include easy entrance for artists and ease of set up of musical instruments/amplifiers/microphones etc.
- the TV stage set should include a main platform for the quiz show presenter for main focus.

# DESIGN AND TECHNOLOGY

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| <p><b>Paper 9705/04</b><br/><b>Project 2</b></p> |
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## **Key messages**

- Candidates need to understand fully the requirements of the Product Development criterion at the start of Project 2. This is a substantial and important stage in the development of the selected design idea and should be presented as evidence of practical design thinking rather than a collection of information on materials, constructions, finishes and other items, as is often the case.
- Product Planning should include all practical information from which a skilled person could make the proposed product. This should include a detailed working drawing, a list of the materials required to make the product and an effective order for the sequence of operations. The latter does not need to contain too much detail but highlight special production methods.

## **General comments**

Many candidates had developed a keen interest in their Design and Technology project work. In addition to the usual range of household items and architectural models, interesting outcomes included: recording station, portable bar, portable outdoor kitchen, model library, condensate pump, display case, garden cart, dog's bed, camera accessories, braai stand, chessboard table, car storage pod, tablet dispenser, cup heating holder, automatic curtain track, car wing, magnifying work station, shopping trolley, cutlery storage, fishing lure, cycle light, flower display system, drafting table, laptop holder, water conservation and storage.

Centres are reminded of the requirement to include detailed photographic evidence of the final realised product for Project 2.

## **Comments on Individual Assessment Criteria**

### **Question 5**

#### **Product development**

Successful candidates either took the final design idea(s) from Project 1 or started with a new idea and specification and then considered all aspects of form, materials, components, constructions, finish and production methods in detail. All information was linked to the chosen idea and where alternatives had been considered, and choices made, reasons for these were given.

This section of the assessment scheme also requires candidates to carry out some form of testing. This can be of materials, constructions, form, etc., but it should be obvious how this links to the design idea being developed. Candidates need to include written or photographic evidence that this has been carried out.

In some projects it is not always clear why the selection of materials, components, constructions, finishes and production methods have been made and there is often a big gap between the chosen design idea and the final product. Once these decisions have been made, the final part of the development should include details of the final solution, mainly in the form of drawings.

## **Question 6**

### **Product planning**

Most candidates set out a sequence for the main stages of production, often produced in flowchart or tabular form linked to some form of time plan. There is no requirement for candidates to show how basic techniques will be carried out, but many candidates included details of the more complex methods of manufacture.

Technical information should include a clear working drawing, a list of all materials to be used and any components or fittings required.

Candidates are not required to include lengthy photographic evidence of all stages of manufacture although some photographs can be helpful when highlighting certain aspects of the manufacturing process.

## **Question 7**

### **Product Realisation**

Many candidates produced high quality products that could clearly be put to their intended use. The care and enthusiasm put into the making of their design outcomes in terms of construction methods and finishing techniques was seen in many candidate projects. Many well-developed practical skills were clearly applied.

Centres are reminded of the need to include clear and detailed photographic evidence of made products in line with the guidance set out in the syllabus document. These must be submitted as part of or with the project folio for moderation purposes.

## **Question 8**

### **Testing and evaluation**

Many candidates carried out meaningful testing and evaluation. This can only be achieved if the product is shown put to the use intended and the results compared to the original design specification. It is always helpful when candidates include photographs of the product being used and tested, in the intended environment.

The completion of questionnaires and the recording of views of others are only of use where the results can be collated and compared to the intended use of the product and some form of qualified judgement made and recorded.