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# DESIGN AND TECHNOLOGY

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Paper 0445/01

Common Core

## General comments

All questions on the paper were accessible to candidates and they responded with an encouraging level of success. **Part A** was designed to test candidates' knowledge of the Common Core content of the syllabus and many showed that they had a broad understanding of the subject, scoring high marks.

As usual, there was a wide range of responses to **Part B** questions and many candidates should be congratulated on the wide range of design ideas presented, the depth of information included for the final solution and the clear communication skills used. In these cases the Examiner was able to follow clearly candidates' responses. All candidates are encouraged to set out their response to the **Part B** question in line with the sections of the question, as asked, as this helps the Examiner to follow their thought process.

Candidates handed in their answers to the two parts of the paper as instructed on the front of the question paper and the Examiner would like to thank Centres for their assistance in this respect and for despatching scripts in the correct numerical order.

## Comments on specific questions

### **Part A**

#### **Question 1**

The majority of candidates were able to draw the front view of the given metal block in the outline started for them although some did not project all of the detail correctly and thus lost some marks.

#### **Question 2**

A large proportion of candidates scored high marks by completing the table correctly.

The Examiner was happy to accept any hardwood for the furniture.

Various uses were given for steel sheet and these were accepted so long as the application would not have been more suited to non-ferrous metals.

Most candidates were aware that acrylic was a thermoplastic material. Candidates struggled more with suitable uses for polyester resin but GRP moulding applications were common correct responses.

Candidates were generally able to identify brass, copper or gold as suitable materials for electrical contacts.

#### **Question 3**

- (a) Most candidates were able to list four specification points for the child's toy but these were not always specific or qualified enough for all four marks. For example, reference to colour must be along the lines of: 'Be colourful to attract a child's attention' and not just: 'Be coloured'.
- (b) Many candidates gave generic materials such as hardwood, plastic etc. but they needed to be specific, as asked for in the question, for the award of marks. Reasons for choice were usually appropriate so long as the material was correct.

#### **Question 4**

Some candidates ignored the requirement of the question that the energy and its stored form be portable for use in different places. As such they could not score maximum marks. The most popular correct response was for chemical or electrical energy stored in a battery to power portable equipment.

**Question 5**

- (a) Most candidates labelled correctly the input gear rotating in a clockwise direction.
- (b) Surprisingly few candidates named correctly the small gear wheel as an idler.
- (c) Candidates were asked to show their working for the calculation of the output gear so the Examiner was able to award some marks even when the final answer was incorrect. The speed of rotation should have been calculated as 60 rpm.

**Question 6**

- (a) The tool drawn was a centre punch although the Examiner was happy to accept dot punch. The other tool with which it needed to be used was a hammer.
- (b) It was anticipated that the mortise chisel would be used with a mallet. The Examiner accepted the simple term 'chisel' but was not prepared to accept hammer in place of the mallet.

**Question 7**

There were at least six reasons for stopping the drilling operation the most popular being: no eye protection; holding material by hand; second person with hand on switch and too close. Most candidates were able to identify three.

**Question 8**

- (a) As might be expected, some candidates were confused between anthropometric and ergonomic information. For the award of all four marks the Examiner was looking for reference to links between body measurements and the height and size of the seat, height and width of the back etc.
- (b) Candidates were expected to suggest an improvement to the underframe by, for example, the addition of stretcher rails and the Examiner was happy to award full marks if candidates added these to Fig. 5. Other sensible improvements such as reference to triangulation or gussets somewhere in the construction were awarded marks on merit.

**Question 9**

As with all questions of this type, where candidates are asked to give an explanation as part of their response, the Examiner is looking for sound reasoning linked to a course of action and there is not always a clear right or wrong answer. Many candidates made brief reference to the use of other materials but rarely gained more than one mark. This needed to be expanded on with, for example, statements such as: 'in places that could not be seen' or 'by using hardwood veneers on other materials'. This type of response then gained two or three marks.

**Part B**

**Question 10**

This question was aimed at those candidates taking the Realisation option and, as such, was the most popular. Candidates were clearly familiar with the design situation and most were able to pick up on the point that the seating would need to be fairly light in construction with a wide range of possible designs being seen.

- (a) Candidates had little difficulty listing four points about the function of the seats including: weather resistant; stable in use; quick to assemble/fold; easy to transport; lightweight etc.
- (b) The Examiner was pleased to see a wide variety of different pivot and sliding mechanisms including: screws; nuts and bolts; rivets; spindles; slots; notches etc.

- (c) It was pleasing to see that more candidates than in past examinations were adding meaningful notes about the function of design ideas and the types of material and construction that might be used. Although there is no intention to specify the number of ideas presented, candidates should be able to gain maximum marks through three or four well communicated designs if they are different in nature and include meaningful detail and annotation. There is a temptation for candidates to present many simplistic drawings or variations on a single theme. This section presents the opportunity for candidates to 'think with a pencil' and to be as brave as they wish in the creation of design ideas.
- (d) Good evaluations were often in list or bullet point form and referred to the requirements of the design problem and specification points made earlier in the question. Unfortunately, evaluations were often somewhat subjective in nature. Candidates are reminded of the need to give reasons for the choice of ideas for development. Candidates either evaluated ideas alongside drawings as they were produced or produced a separate section after the ideas stage. This year candidates from a few Centres produced a table awarding points as to how well each design idea matched the specification points listed in part (a). This method can only be awarded maximum marks if candidates explain how the points are scored and how they make their final decision.
- (e) For the award of high marks candidates are required to provide sufficient information from which a skilled person could make the design. This should be in the form of detailed drawings including dimensions and all constructions. Any appropriate projection method or combination of methods can be used. Unfortunately, as in previous years, candidates often simply repeated drawings and ideas from the previous section adding little of the required detail. This section of the question carries the highest proportion of marks and as such should be given an appropriate amount of time.
- (f) Candidates often gave generic terms such as wood, metal and plastic which are unacceptable in the selection of materials. Specific materials must be identified with reasons for choice which link to the developed design idea. Unfortunately, candidates' responses were often of no relevance to the final product. Good responses to this part of the question can be in tabular form.
- (g) Fewer candidates than in previous years attempted to make the whole product and successful responses focused on just one, often small, part of the solution, as suggested in the question. Successful candidates made it obvious that they were familiar with a wide range of production methods, materials and equipment.

### Question 11

This was the second most popular question and intended for those candidates who had followed the Graphics option. Candidates approached the message of the campaign in a variety of ways with some placing emphasis on the wording and others on the images.

It is important for candidates who choose this particular question to include all the required information when they respond to part (e). Although many candidates gave a good graphic representation of their final solution they failed to include details of: materials; how the logo/slogan would be made; how lettering and other graphics would be applied and any other important information linked to its production. As a result they lost the opportunity to score high marks for this part.

- (a) Requirements for the appearance included: easy to read; inclusion of an animal; simple message; bold; easy to reproduce etc.
- (b) Candidates had few problems identifying items on which the logo could appear including: tee shirts; ties; pens; carrier bags; badges etc.
- (c)(d)(e) See **Question 10 (c)-(e)**.
- (f) Most candidates were able to identify two reasons for the use of a computer in the design of such a product and these included: easy to store ideas; use of colour; designs sent straight to production machines etc.
- (g) Candidates described an item that could be used to support the campaign, with a tee shirt being the most popular by far. Many failed to include details of how the logo would be applied apart from general terminology such as stick on and print. It is expected that candidates following this option should be able to be more specific in this respect and, for example, state the particular method of printing.

**Question 12**

This question was intended for those candidates following the Technology option but it was answered by a very small number indeed. However, solutions often included imaginative methods for feeding the pet animals and candidates addressed all aspects of the problem in a thorough and thoughtful way. The most ingenious included mechanisms that could be initiated by the animals making contact with some form of touch sensitive pad.

- (a) Candidates successfully identified points about the function of the feeding system including: reliable; providing a set amount of food; easy to operate; easy to fill; easy to keep clean; does not harm animals etc.
- (b) Some candidates had difficulty describing mechanisms that could control the supply of food but the Examiner was simply looking for answers such as: valve; slider; door; screw; chain/bucket etc.
- (c)(d)(e) See **Question 10 (c)-(g)**.  
(f)(g)

**Question 13**

Although this was the third most popular question it was still answered by a significant number of candidates. The topic obviously appealed to many candidates and most seemed very aware of the problems involved and had a good knowledge of different methods that could be used to ease the task of opening a drinks can.

- (a) Candidates were able to identify functional requirements of the opening device such as: simple to use; easy to grasp; does not harm a hand in use; light and portable; inexpensive to produce etc.
- (b) Candidates were able to identify simple mechanisms for decreasing effort and these include: levers, screw threads; gears; wedges; cams; over centre devices etc.
- (c)(d)(e) See **Question 10 (c)-(g)**.  
(f)(g)

<p><b>Paper 0445/02</b> <b>Communication</b></p>
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**General comments**

The standard of work was comparable to that of the previous year. **Questions 1 and 2** were the two most popular questions for candidates.

There are areas of the syllabus however, in which further improvements are needed. These include in particular, geometrical constructions and the correct method for determining the true lengths of sloping sides. The sketching of cylinders and cones and the application of shading to give a 3-D effect is also an area for improvement.

**Comments on specific questions****Question 1***Ocean Hospital notice board*

This was by far the most popular question. Most candidates gained a high number of marks for their answers.

Two marks were given for use of **Ocean Hospital** in their logo with a further two marks for the quality of the design sketches. Many candidates drew just one idea with most candidates failing to develop an initial concept sketch. Some candidates did not position their chosen logo in the given space so that it fitted or filled the area available. A small number of candidates simply sketched their one idea again in the space, failing to score the three marks for accuracy and drawing of the chosen logo.

The drawing of the diagram on the given notice board enabled many candidates to acquire marks. However, many candidates failed to use the space effectively with a number of candidates drawing their own shapes for the traffic island (4 marks) and using their own relative proportions for the departments (4 marks) and the car park (1 mark). A small number of candidates omitted the entrance gateposts and also failed to give an indication of 'you are here'. Overall layout quality and spacing (4 marks) was not evident from a number of candidates.

Printing the words 'Car Park' and 'Medical Wards' produced a wide range of marks with many candidates writing in a script style and not printing. Marks were awarded for size and proportion (2) and quality (2).

## Question 2

### *ENEDEX advertisement*

This was the second most popular question. Many candidates were attracted to this question by the elliptical shape. Few however, used a geometrical method for enlarging the triangular based shape of the trademark.

Most candidates managed to draw an ellipse within the four points (5 marks). Where candidates have used a trammel, this should also be drawn or fixed to the examination paper. Without this the full marks cannot be awarded to the candidate.

Many candidates failed to use their drawn ellipse or the four given points to provide a vanishing point to enlarge the triangular shape of the trademark. Marks were awarded for lines parallel (2 + 2 marks) and the correct position on the major axis (1 mark) of the triangular shape.

Many candidates produced a pie chart, block diagram or line chart (3 marks). The accurate representation of the figures was varied. Some candidates converted the percentages into degrees of a circle where other candidates used the percentages as heights in millimetres of bar charts.

Some interesting symbols were designed by a few of the candidates (2 marks). The application of these to the drawn chart scored a further 4 marks. This is an area where many candidates score few marks because they have misinterpreted what the question stated. The area given on the paper for design sketches was not always used.

## Question 3

### *Hanging basket*

This was the least popular question on the paper. Of those who attempted it, many failed to draw the true length by swinging the edge of the octagon round on the plan and then projecting it up to the front elevation. Many candidates used a mathematical method of calculating the true length of the support wire. The circular hole was drawn by many candidates as a circle and not constructed to give an elliptical shape when viewed from above and drawn in the plan.

Candidates would have achieved a higher number of marks had they used the front elevation to help them determine true lengths.

Many candidates managed to score two out of the three marks for Regular (1) Octagonal (1) Pyramid (1).

Many candidates drew a projected front elevation correctly above the given plan. However, a few candidates failed to get the height 60 (1 mark) and the height 80 (1 mark) correct. Most candidates managed to get the sides of the octagonal container and the wires connected up correctly.

The true length of the wire was calculated incorrectly by many candidates. Very few candidates used the geometrical method for determining the true length of the edge of a hexagonal pyramid.

Of the few candidates who attempted this part, most took the true length of the vertical side of one thin panel from the front elevation and drew it in the space to the right of the base using one of the sides for the base of the true shape triangle.

If (d) had been done correctly, a circle can be drawn on the true shape. Projecting division lines of this circle up to the front elevation (and swinging them to the angled side of the inverted pyramid) the true spacing of the division lines can be projected down onto the plan. The lengths of the dividing lines can now be projected onto the plan to give the elliptical shape of the circle when viewed from above. This proved to be outside the knowledge of most candidates with very few scoring any marks at all.

#### Question 4

##### *Salt, pepper and mustard pot base*

This question was attempted by very few of the candidates. For those candidates who attempted this question, a wide range of marks was gained by their answers.

Design sketches varied in quality and complexity. Most designs accommodated the three pots but it was not always clear how they were held.

The 'freehand isometric sketch' showed that many candidates did not use centre lines or 'crating' to help them with this type of sketching. Many candidates did not sketch full size (1 mark) or to the isometric axis (2 marks). The accurate drawing of the truncated cones for the salt and pepper was not evident for most candidates. Very few candidates included a top and a cut out for the cylindrical mustard pot. Most wooden bases were of a reasonable thickness in proportion to the overall size.

The shading and colour to the wooden base (3 marks) was done reasonably well. Unfortunately, few candidates managed to score more than one mark for the shading and colour to the mustard pot.

<p><b>Paper 0445/03</b> <b>Realisation</b></p>
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#### General comments

The results this session show a greater awareness of the use metal materials and the skills associated with them. This is a pleasing development, and a number of candidates were able to write about the value of computer technology when manipulating metals.

Many candidates failed to spend time reading the instructions and consequently attempted to answer all four questions. This, in most cases, because of the time factor, means they fail to gain more than average marks in any question.

#### Comments on specific questions

##### Question 1

This was the most popular of all the questions and shows the influence of the DIY industry on the practical application of craft skills among young people.

- (a) The parts list presented no problems.
- (b) Many candidates failed to realise the need for a material of a different structure for the back of the shelves.
- (c) Many failed to appreciate the logic of the material thickness graduating from the back being thinnest to the thickest being the shelves.
- (d) Very few realised the need for two fixings at each end of the shelf and used just one. This means that they always calculated the number of fittings, and screws incorrectly.
- (e) This part was generally well answered.
- (f) Some very good answers were given, and in most cases the correct sequence was used. However, the clarity of sketching was often weak.
- (g) Often there were very good answers, but many failed to give the most important one i.e. to keep the shelves square.

## Question 2

This was quite a popular question and the use of metal was well reasoned.

- (a) Suitable reasons for the use of sheet metal were given.
- (b) Good clear developments (nets) were shown, and reasons given.
- (c) 1. 2. Satisfactory knowledge of tools and good sketching were shown.
- (d)(i) Use of tin snips was not well described, though knowledge of guillotine was evident.
  - (ii) Draw filing was rarely mentioned, and other methods not often seen.
  - (iii) Use of folding bars was described by many candidates.
  - (iv) Good use of rivets and pop rivets were shown. Glue was suggested but the correct type was rarely mentioned.

## Question 3

A popular question, though candidates often failed to understand part (c), concerning problem solving.

- (a)(i) Candidates dealt with this part in a straightforward manner.
  - (ii) The material for the working surface proved difficult. For some reason candidates failed to realise the need for a manufactured board i.e. plywood or mdf.
  - (iii) Most candidates used a mitre joint here which is difficult and unnecessary. A haunched mortice and tenon would have been suitable.
  - (iv) This was mostly correctly answered. The use of glue, rather than PVA or some other suitable adhesive was often offered.
  - (v) There were many reasonable answers, though few candidates were able to describe hinges correctly recessed.
- (b) The candidates tended to complicate this part by passing up a simple answer and looking for a more complex solution, failing to recognise the need for simplicity in solving problems.
- (c) Some very good ideas were presented. However, in many cases the idea was spoiled by the candidate's inability to sketch clearly and accurately.

## Question 4

Many candidates failed to fully understand this question; in many cases they did not read it carefully.

- (a) Many candidates were able to recognise the need for a manufactured board or plastic material as opposed to a softwood.
- (b) Candidates found this difficult and failed to give clear satisfactory answers.
- (c)(i) In general a good sequence of stages was given, and this part well answered.
  - (ii) Six tools were usually well selected.
- (d) There were many sensible well thought out solutions.
- (e) This was well answered, with good knowledge of plastics shown.
- (f) There were many acceptable answers, but few gave the most important one of colour.
- (g) Many candidates failed to read this part of the question carefully. Many answered by designing a package, rather than finding a way of keeping the pieces in place when the game is in use.



<p><b>Paper 0445/04</b> <b>Technology</b></p>
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**General comments**

The paper afforded a good cross section of the syllabus and allowed access to the full range of marks across the full ability range. The mark scheme allowed for a wide range of acceptable and appropriate responses to be rewarded. In general those candidates with good practical experience of the technological areas covered by the syllabus were able to reinforce their answers with examples and thus to access the higher marks available. Good responses were characterised by use of annotated sketches, appropriate examples cited and accurate technological terminology.

**Comments on specific questions****Question 1**

Though a popular choice many responses lacked accurate technological vocabulary. The calculation element was also poorly attempted.

- (a)(i) This part was generally well answered with most candidates accessing full marks.
- (ii) This part was generally well answered with most candidates accessing full marks.
- (b)(i) Few candidates were able to use the correct technological terminology for the section names. Similarly the names given for the materials were generic, e.g. wood. No candidate was able to identify the use of 'I' section for lintels or girders.
- (c)(i) Few candidates were able to identify the rigidity of the triangular shape and again were using non-specific technological terminology in their responses.
- (ii) Most candidates named the gusset plate as a method for reinforcing the joint at 'A'.
- (d) This part was poorly attempted by all candidates who answered it. There was little understanding of either how to calculate the reactions or the behaviour of systems in equilibrium.
- (e) Most candidates were able to identify all three parts of the structure.

**Question 2**

- (a)(i) Few candidates were able to identify correctly the three different classes of lever shown. Many correctly identified the class two lever but few were able to identify the other two types.
- (ii) No candidate was able to identify the relationship between the applied force and its distance acting from the pivot and the magnification effect resulting from this relationship.
- (iii) Many candidates correctly labelled the wheelbarrow in terms of load, effort and fulcrum.
- (iv) Most candidates were able to score well by lengthening the handles to create more leverage.
- (v) Few candidates were able to show the conversion of rotary to linear motion that takes place when the barrow is wheeled forward.
- (b) Most candidates listed the advantage of 'no slip' when using sprocket and chain over belt and pulley.

- (c)(i) Most candidates were able to calculate the VR of the system.
- (ii) Few candidates were able to calculate the MA of the system.
- (iii) Similarly there was confusion when candidates attempted to calculate the effort needed to move the given load.
- (iv) Most candidates identified the bicycle as another example of the use of chain and sprocket.
- (d) Few candidates were able to determine the load lifted given the MA and effort input.

### Question 3

- (a)(i) Few candidates were able to number the pins of the 555 chip.
- (ii) This element was well understood and well answered by the majority of candidates.
- (iii) Few candidates were able to identify the 'Push to make' switch.
- (iv) Some candidates were able to explain the electrolytic capacitor having polarity and that they are usually used for large value capacitance.
- (b)(i) Few candidates were able to complete the circuit diagram for a flashing light circuit.
- (ii) There was poor understanding of the mark/space ratio.
- (iii) Most candidates were able to identify the LED as the light device.
- (c)(i) Many candidates were able to show a feasible method for fitting a base temporarily to the casing and by good use of annotated sketches were able to access the majority of marks available here.
- (ii) Fewer candidates were able to show a design for a battery clip/retainer.
- (iii) Few candidates offered a suitable plastics material for the casing.
- (iv) Most candidates correctly stated that vacuum forming would be a suitable method for forming the casing.

### Question 4

- (a)(i) Few candidates were able to describe how a strain gauge works in terms of resistance and its relationship to length of the resistance wire.
- (ii) No correct circuit plan was marked. There was little evidence of sound understanding of the inverting amplifier.
- (b) Most candidates offered the use of wood or straw modelling and were able to gain most of the marks available. Practical experience was evident in the responses of stronger candidates.
- (c) Though few candidates were able to determine the forces in each member some could determine the values of  $R_1$  and  $R_2$ . Few could name the struts and ties in the structure. Little evidence of thorough understanding was observed.
- (d)(i) Most candidates were able to draw a gusset plate. Few named the use of scarfing to joint long beams. Many were able to identify the pop-rivet.
- (ii) Few candidates identified the advantage of joint (a) as having a greater surface to weld together.

<p><b>Paper 0445/05</b></p> <p><b>Coursework</b></p>
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### **General comments**

A wide range of coursework projects was presented by candidates and in the majority of cases this had clearly emerged from a real problem in the candidate's home, school or local community. In addition to the usual range of household items and furniture, interesting outcomes included: board games; skateboard trick box; drinks holder for a wheelchair; fire screen; portable cooker; automatic water cut-off; longbow compressor; water tap lock; outdoor clothing; boathouse model; surfboard storage; conveyor belt safety device; greenhouse; bottle storage and water toys.

It is important that Centres support and guide candidates in the selection of their design problems so that they take on tasks that are both manageable and provide the opportunity for them to respond to all parts of the assessment scheme.

The sample of work presented for moderation was suitable in most cases and Centres had generally applied the assessment criteria appropriately although, in some cases, not at the correct level. Centres new to this syllabus are advised to refer to the exemplar coursework material contained in the Distance Training Pack, obtainable from CIE, if they have not already done so.

Centres are reminded of the need to select the moderation sample in line with the guidance given by CIE. The sample should cover the full range of candidates' marks and must also include the highest and lowest marks awarded. Where marks have been internally moderated it is helpful to the Moderator if changes to individual criterion marks can be indicated in addition to total marks. The Moderator would like to thank the majority of teachers who provided assessment documentation clearly set out in line with CIE's requirements.

All folders must include clear photographic evidence of made artefacts showing close up detail to support the award of marks in addition to an overall view of the product made. Centres are asked not to send the work of all candidates when this is more than the required sample stipulated by CIE.

It is noticeable that, in Centres where candidates have been required to number all pages and include a contents page at the beginning of the folder, the design process is easier to follow and candidates tend to cover all requirements of the assessment scheme.

### **Comments on specific assessment headings**

#### **Analysis of problem and design brief**

The majority of candidates stated clearly the problem to be addressed and this was usually followed by a clear design brief. However, the degree to which candidates researched the design *problem* varied enormously. Candidates should be encouraged to complete adequate and relevant research in order to create a suitable knowledge base prior to the formulation of the specification. 'Cut and paste' extracts and drawings of other existing artefacts should always be accompanied by notes that comment, in some way, on the item being shown. Comments and annotations can be either on the suitability of the item in the context of the design brief or on any other feature that may be useful in the subsequent creation and development of ideas.

Unfortunately, many Centres are still allowing their candidates to include information on materials, components and constructions taken directly from textbooks. Information of this type is totally irrelevant at this stage of a design process, and cannot be awarded any marks, but should be considered at the development stage when ideas have been explored. Candidates should also be discouraged from wasting time on the history of the product area being considered unless, of course, it is absolutely fundamental to the development of the design folder.

It is accepted that many product outcomes will be in the form of models. This may be because a full size artefact would be beyond the facilities at the Centre or the time constraints of the course being followed. Candidates following the Design Communication option within the syllabus will often produce models as a natural outcome of the subject content. This is perfectly acceptable, and expected, but it is important that candidates make this absolutely clear in their design brief so that all subsequent work focuses on the model.

## **Specification**

It is worth pointing out that this section of the design folder is awarded the same number of marks as the previous one. It is not always obvious from work presented that candidates are aware of or appreciate this.

All too often specification points are generic in nature and could be applied to any product. For example, 'Must be safe in use' does not tell the reader very much and must be qualified with a reason linked to the analysis or brief if it is to be considered for the award of marks. The specification is best presented by a list of separate requirements so that subsequent reference during the exploration of ideas and the final product evaluation is straightforward.

The specification should not start to solve the problem by listing materials, constructions and the like but should emerge from the analysis of the problem and should state clearly the specific design requirements for the final outcome. At this stage the design should still be very open so that all possibilities and ideas can be considered.

## **Exploration of ideas**

This section of the design folder is awarded the highest number of marks and in many ways is the most important. It is the stage at which candidates can go off in almost any direction from the specification and explore a variety of avenues for solving the design problem. The Moderator would expect successful candidates to include a few surprises in their design thinking. It is the opportunity for candidates to show evidence of their ability 'to think with a pencil' and include examples of genuine design creativity. Successful candidates included a wide range of different ideas presented by clearly annotated sketches. Too often candidates presented a few formal drawings that showed little design flair and tended to follow a single concept.

These ideas can be presented most successfully through simple pencil sketches and candidates should be encouraged to include everything that comes to mind however feasible it may appear at the time. These ideas do not have to be of complete products but can be mini developments of parts of ideas as thoughts come to mind. Annotations should include comment as to how an idea might link to the specification.

Candidates at some Centres made good use of ICT skills in their design folders and this is encouraging to see. Although there were not so many examples this year, the Moderator is still not convinced that use of a computer drawing package is the most appropriate way of exploring and recording design ideas in this section of the folder.

## **Development of proposed solution**

This is the section of the folder where a candidate's chosen idea or selection of ideas becomes reality. It is the point at which they need to consider alternatives and make final detailed decisions about form, materials, construction methods and finish to be used in the product realisation. Many candidates found this difficult to do and in far too many cases the final idea was simply a repeat of one of the ideas recorded in the previous section. Most candidates must make decisions leading up to the detail of the product to be made but, unfortunately, they do not always keep a record of their thought processes. Candidates are not required to develop more than one potential outcome.

Most candidates showed their ability to produce formal drawings and final design solutions were generally well presented and gave sufficient information for the manufacture of the product by a skilled person.

## **Planning for production**

Some candidates gave themselves away by writing this section of the folder in the past tense. The planning must show clear evidence that the production of the artefact has been thought about in advance. It should not be a record of what has already taken place, as was unfortunately the case with the work of far too many candidates.

Details of materials and components to be used should be included together with the main stages of the production set out in logical sequence. A suggested time plan should assist candidates and should include comment when this has not been adhered to. Candidates are not required to include detailed descriptions of basic procedures such as the preparation and simple marking out of materials, but they should be encouraged to show evidence of the planning of unusual techniques, particularly those that are new to them.

### **Quality of production**

Some candidates should be congratulated on the very high standard of their practical work. Clearly, some products had been made very well and as such could perform the intended purpose. There was evidence of a wide range of technologies and materials being used and this included sensible use of materials beyond the expected: wood, metal and plastic in the manufacture of some products.

It is clear to see that candidates enjoy this part of the course and continue to take pride in the quality and success of their made artefacts.

Where a model forms the basis of the made product it is important that appropriate materials are used and that the same high standards are maintained. An architectural model will never convince potential customers if it is poorly made.

### **Evaluation**

This section of the folder should open with some evidence of consumer or user testing in the intended environment. This may be in the form of photographs or a written record of what has happened. Evidence of questionnaires can play a part in this but by themselves they often say very little. Candidates should go on to link the outcome of this testing to the original specification and make objective and qualified statements on the success of the product. This section should also include suggestions for further modifications or possible improvements to the product.

Centres are reminded that this section must be an evaluation of the final *product* as, too often, candidates referred only to issues and problems linked to the making of the artefact and/or the production of the design folder with the addition of their own subjective appraisal of the outcome. Evaluations of this type cannot be awarded marks beyond the low level of achievement.

Where the final product is a model then the evaluation should be of the effectiveness of the model in relation to the potential intended full size artefact whenever possible. Unfortunately candidates often simply commented on the model in its own right and did not relate the evaluation to its intended purpose.

### **Fitness for purpose**

It is quite difficult for the Moderator to comment on this section in any meaningful way, as it was not possible to handle or use the made products. However, it is important that Centres make use of the full mark range when making this assessment so that fair and sensible discrimination is made between candidates. The Moderator is never really convinced when the work of all or most candidates appears to be a 'Completed solution fulfilling the brief' and as such is awarded full marks.