

# DESIGN AND TECHNOLOGY

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Paper 6043/01

Paper 1

## General Comments

The results this year are a little below last year's excellent standard. Some candidates are giving answers to practical situations that are quite dangerous in a school workshop. Most metalwork answers seem to involve the use of the off hand grinder. This tool is not suitable in a workshop full of people and needs special care and handling. The standard of drawing and sketching is lower, with many candidates using just text for a graphic solution. However, injection moulding is still well understood and illustrated by most candidates.

## Details

### Part A

#### Question 1

The majority of candidates gave the correct answer with a good sketch of a folding bar. Some candidates however suggested a round bar.

#### Question 2

The majority of candidates were able to give two valid reasons for the use of wood, with answers such as hygienic, easy to clean, will not blunt the knife, etc.

#### Question 3

This was quite well answered with most giving G.R.P. (Glass Reinforced Plastic) but having trouble with P.V.C. (Polyvinyl Chloride).

#### Question 4

Some candidates called it a die whilst others called it a spanner. It was a die holder for cutting external screw threads.

#### Question 5

Most candidates were able to give three simple workshop tests such as heating, cutting, bending, floating on water, etc.

#### Question 6

The edge to edge problem was well illustrated with solutions of T&G, biscuit, slot screwed, grooved, etc.

#### Question 7

All candidates were able to give two dangerous situations with personal appearance such as tie, scarf, long sleeves, long hair, jewelry, etc.

#### Question 8

Vacuum forming appeared to be the chosen method of production with a wide range of reasons given for using plastic such as easy to clean, lightweight, colourful, etc.

### Question 9

This question was quite well answered with a range of faults given such as knots, shakes, cupping, resin pockets, etc.

### Question 10

Most candidates were able to say that the wires hold the ring for the process, but did not add that they pull the joint together. A number also did not name the metal used. A few candidates said the wires had something to do with the electrics.

### Part B

#### *Section 1 – Tools and Material*

### Question 11

- (a) Only a few candidates were able to name the three drilling devices, with tool C the exception. Most candidates had a problem explaining how the drill bit or boring tool was fitted in the chuck. A number seemed to think a chuck key had to be used on them all.
- (b)(i) Most candidates gave manual effort and time taken as the limited use of tool A.
- (ii) No one seemed to understand the ratchet system and its use.
- (iii) This part was well understood with its speed, less effort, rechargeable, etc.
- (c) Only a small number of candidates were able to explain the problems of friction.

### Question 12

- (a) Only joining acrylic to acrylic had valid answers such as tensol cement or other solvent. Some candidates seemed to misunderstand the question, giving answers such as nails, bolts, screws, etc. What was required was a bonding method such as adhesives, solders, etc.
- (b) Most candidates understood that a joint needed cleaning but did not mention about gaps, uneven surfaces, etc.

### Question 13

- (a) All candidates were able to give two properties for a material to be used as a salad server such as colourful, hygienic, waterproof, easy to clean, etc.
- (b) Most candidates were able to give a valid reason for selection and a reason for rejection.
- (c) Only copper proved difficult with the method of annealing needed to soften the material.
- (d) Most candidates gave the correct answer about the need for a flat surface and safe holding of the material.

### Question 14

This was a popular question with candidates with good use of drawings.

- (a) Most candidates named safety factors for child's toy such as nontoxic paint, no small parts which can be put in mouth, no sharp edges, etc.
- (b)(i) A significant number of candidates proceeded to turn the question round and talked about welding instead of brazing.
- (ii) This part was well answered and well illustrated, however, many candidates missed the way the three parts of the toy needed to be held together.

- (iii) This was quite well answered with some excellent detailed drawings of the cutting and finishing process.

### Question 15

Only those candidates who decided to make the step from solid had problems.

- (a) Most candidates were able to name two properties for the step such as must be strong to carry elderly persons weight, waterproof, easy to form shape, colourful, etc.
- (b)(i) Most candidates suggested wood pieces and joined them together with a mitre, glue and nails.
- (ii) Better answers used casting, injection moulding, vacuum forming, etc., with lots of detail.  
Weak answers tried to make the step from a solid block of wood and chisel the waste out.
- (c) Limited answers with mainly just rubber sheet added to the insert.

### Question 16

This was a popular question with candidates.

- (a) Explaining the dangers of the toy was well covered, and how children may swallow the small pieces.
- (b)(i) The making of the board was well explained and a range of methods used such as making it from solid material with hand processes. Others responses used casting, injection moulding, vacuum forming.
- (ii) Many answers just suggested two pieces of dowel glued together, the problem being getting them to line up true. The best answers used the woodworkers or centre lathe and turned it true. Others used the injection moulder.
- (c) A nice range of ideas to identify the differing sets of pieces. These ranged from painting the pieces to cutting noughts and crosses on the ends.

### Question 17

More detail was required from candidates in answer to this question.

- (a) Two sheet materials easily identified and solid reasons for choice. These ranged from copper, teak, acrylic, silver, etc.
- (b) Only limited detail on the making of the ring were given, with many stages missing, such as preparing the material ready for bending round a former, not just hammering.
- (c) There were a range of ideas for the ring holder, however some of the drawings were unsatisfactory.

### Question 18

The making stages needed more detail.

- (a) All candidates were able to name a suitable material and give two reasons for choice.
- (b)(i) Marking out appeared to be a template. The best solutions used a marking or mortice gauge or a pair of odd legs.
- (ii) Making the slot proved as difficult with the drilling of two holes at each end correct but then some candidates did not explain how the waste was removed. Also, many answers did not clamp the work while its being worked upon.
- (iii) In the main, it was the jig or coping saw that was used for cutting the outline shape and a sandpaper block to finish.

(c) Few candidates gave the correct reason for the slots in the bracket i.e. for adjustment or alignment.

### **Conclusion**

Overall, the results appeared to be below last year's good standard. The examination was fair and a good test of a candidate's knowledge.

# DESIGN AND TECHNOLOGY

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Paper 6043/02  
Design Project

## General Comments

The theme topic titled '**Frames and Boxes**' was well understood by candidates. Candidates were generally familiar with frames and boxes. Many candidates presented a clear exposition of the different types of frame and boxes that were used in existing artefacts or were possible solutions to problem areas. For example, some candidates looked at various ways in which a photograph could be presented either using a frame construction or in a new and unique way. Some candidates presented research which searched for different potential design problems involving a box or a frame; this approach often led to a design brief which they wanted to develop.

Eight sub themes were presented in the Project Theme under the overall heading of 'Boxes and Frames'. The sub themes provide a starting point for candidates to carry out a wide investigation of a number of problem areas before they focused and reduced the areas to one problem which they wished to develop further. The sub themes ranged from directly related ideas, for example, 'photographs, pictures and paintings' to less obvious outcomes which could be developed from the sub theme 'supporting items'. Whatever the approach taken by a candidate in their research, it was important that the thoughts of the candidate were well documented in the design folio under the heading of 'general analysis of the topic'.

Candidates investigated many possible problem areas. These often included problem areas which were directly related to their home situation or some personal context which required a box or frame solution. The following examples give an insight into the depth and range of ideas which emerged from the theme research: containers for loose items - including toys, games, coins, tools, kitchen utensils, beauty products and other items which benefitted from being collected or stored in one place. Further examples included shoe rack, CD rack, jewellery box, laundry box, post box, germination box, kennel, first aid and toy box. Frames were introduced to many different situations, most involving the framing of a photograph but often in unusual ways.

Many candidates set out a form of time plan for the completion of the design folio and the artefact. Often a Gantt chart was used to set out the time span for the project. Where this was completed correctly, with evidence of ongoing updating and comments, it was a useful addition to the project. Often the purpose of planning the time available was misunderstood by candidates and in many cases the Gantt chart remained unvisited throughout the term of the project, making the addition of such a planning device less valuable.

## Comments on Individual Assessment Criteria

### **Part A - Design Folio**

#### **General Analysis of Topic**

Centres continue to offer candidates a suitable amount of support at the commencement of the theme investigation. This approach ensured candidates are guided to progress through the production of artefacts which are within the scope and capability of the candidates and the resources available to them. Candidates used a number of methods to refine their research, including bubble diagrams, mind maps and other approaches which gradually focused on a preferred area. Some candidates made a full analysis of the theme before looking at each section in more detail. Candidates were usually successful in identifying one preferred problem area which was sufficiently clear to provide a good base from which to identify the design brief.

## **Formulation of Design Brief and Specification**

Candidates continued to improve the precision of the statement made to describe the design brief. The purpose and role of specification points were better understood by candidates. They made points which were specific to the problem being developed and also listed some original issues which were related to the unique nature of the problem they were investigating.

## **Exploration of Ideas**

Candidates need to explore at least three different ideas to demonstrate their competence when making progress on the various aspects of the design brief being developed. Candidates often added research which was relevant to the various ideas. Notes and annotations always helped to communicate understanding of the candidates' thinking.

## **Detailed Development of Proposed Solution**

Many candidates looked at various aspects of the chosen idea and refined each feature. Examples of this include handles on a box or drawer or different profiles which could be used to make a frame.

## **Suitability of Chosen Materials and Construction**

Candidates often created a specific section in the design folio to set out the materials to be used and gave reasons for the selection of each of the materials. Candidates need to detail specific materials; general classifications such as wood, metal and man-made board are not adequate at this stage of the design process. Often the method of construction was integrated into the development drawings. Additional drawings were used where relevant.

## **Production Planning**

Most candidates set out the planning process in tabular form, using columns to identify the process, materials and procedures relevant to each stage and a list of the tools to be used. Photographs of the actual production process were often used to good effect in this section.

## **Communication**

It is clear that candidates take pride in the production of the design folio. Many folios were carefully organised with a contents page and many used a variety of methods to enhance the pictorial presentations. The methods used by candidates ranged from pencil shading to the use of colour crayons. More sophisticated folios used line enhancement and CAD based systems.

## **Part B - The Design Artefact**

### **Suitability of Proposed Solution**

In the awarding of marks in this section, candidates should provide evidence of a good match to the specification, the folio and artefact should also demonstrate refined aesthetic and technical features. Some candidates lacked elements of this aspect and therefore did not fully comply with the expectations of the assessment criteria.

### **Workmanship**

Almost all candidates displayed a good level of competence in the production of the artefact. It was encouraging that the theme had generated so many design situations which the candidates had finished to a high standard. In many cases, the artefact was produced using high level making skills. There was clearly a desire to complete the artefact and to ensure that it was well presented in the folio supported by the use of photographs.

## Evaluation

Evaluations have improved year on year. Many included the following sections:

- overview of performance
- check on performance against the original specification
- testing the artefact
- making suggestions for modifications