

Examiners' Report Summer 2008

GCSE

GCSE Design & Technology: Resistant Materials Technology (1973/3973)

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Summer 2008

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GCSE Design and Technology: Resistant Materials Technology Principal Moderator's Report - June 2008 1973, Paper 01 (Coursework)

General Comments

This year, moderators report that some of the work seen was outstanding. The majority of centres are now very familiar with the requirements of the RMT course, enabling students to target marks effectively. Previous problem areas such as Systems and Control and Schedule were less problematical as centres paid close attention to the requirements of these assessment criteria and this was reflected in the work presented for moderation. Another indicator that centres are improving in their assessment of students work was in the feedback from moderators to say that fewer adjustments were made to centres marks this year than previously.

The use of CAM equipment such as laser cutters and CNC milling machines continues to increase, but it is pleasing to note that generally, centres are using these tools appropriately and not exclusively. In order to achieve high marks for manufacturing, students need to demonstrate high level skills in using a range of tools and equipment, beyond CAM machinery.

The vast majority of design folders were very well organised and presented. The quality and range of photographic evidence of the final product and its stages of manufacture was once again excellent and centres are to be congratulated on their efforts in this regard.

A minority of centres submitted poor quality images which were unhelpful to moderation. Almost all centres now understand that good quality photographic images are essential if moderators are to agree marks awarded by a centre.

Almost all centres submitted an appropriate number of pages per project, in line with the Board's guidance of 15 - 20 A3 sheets. Most design folios included section headings, page numbers and student numbers. A minority of centres however still insist on presenting portfolios for moderation that include plastic sleeves with several sheets inside each one, sharp metal paper fasteners and expensive, individually zipped portfolios that cause problems during moderation that could be avoided with some forethought.

Although most centres presented appropriate work for moderation, there were still a significant number of centres allowing students to pursue work that is not up to the required standard for GCSE and does not match the requirements of the course. Work that is limited in complexity and challenge is acceptable if it matches the abilities of students and is marked appropriately. Unfortunately, in most cases where such work was seen, over-marking was in evidence.

Overall, most centres were successful in their approach to coursework and are thanked for their efforts in ensuring design folios arrived on time for moderation, correct paperwork was included and requests for extra photographs were acted upon quickly.

Administration

The vast majority of centres followed Edexcel's instructions and procedures efficiently, with few problems. However, this year saw a significant rise in the number of addition errors in CMRBs and errors in transferring marks accurately from CMRBs to OPTEMS forms. Other observations were:

- No annotation in CMRBs
- Low levels of response credited highly
- Student and teacher authentication in CMRBs not signed
- Selected moderation sample not supplemented with highest and / or lowest scoring student's work

Criterion 1

Identify needs, use information sources to develop detailed specifications and criteria.

Needs

Most students scored at least 2 marks in this section, by identifying an appropriate problem and need and writing an appropriate design brief. For full marks, a target market should be identified and many students failed to do this. Where a target market group was identified in a design specification, students were given credit for this.

Information

Many students produced good evidence of researching their work appropriately in this section, focusing closely on their problem and being selective in what information to present. Unfortunately, many students produced large amounts of general information that did not focus on their problem closely enough and included information on materials copied from well known sources, downloaded internet research without comment and other information that was no more than 'padding' that had little or no currency value. In order to access high marks in this section, students are expected to gather information from three separate sources that can be used to inform subsequent stages in their design developments. Analysis of existing similar products, market research, and information regarding relevant materials and manufacturing processes would be useful approaches to take.

Specification

Most students were able to produce a specification that gave them 2 marks and contained statements that reflected research gathered previously. Unfortunately, many specifications were weak and did not contain measurable statements that could be used to evaluate the design/development or finished product against. A strong specification should include reference to form, function, user requirements and budgetary constraints. Each specification point should contain more than one related piece of information about the intended design solution. For the high mark in this section, students need to have considered budgetary constraints, which should include justification of why a particular cost is attached to an intended product.

Criterion 2

Develop ideas from the specification, check, review and modify as necessary to develop a product.

Ideas

As was the case last year, moderators reported that this criterion produced a very wide spread of responses. High quality work reflected the product specification and offered several alternative ideas that were detailed and realistic. Many students produced a large number of alternative ideas, but failed to progress beyond a medium level of response, relying on quantity rather than quality to gain marks. This assessment section was often over-rewarded by centres.

It is not necessary to offer a wide range of completely different ideas in this section, as higher marks are achieved through presenting a range of ideas that are realistic and coherent and these can be in the form of sub-systems or part-ideas that show a good understanding of a variety of materials, components and processes. Ideas should be detailed and show progression from, or link links to, each other and they should always match the specification.

Develop

Most students used this assessment section to supply details of materials, manufacturing processes, formal drawings and cutting lists relating to what was considered their 'best idea', without attempting to develop their designs any further.

It is important to realise that develop means change and there must be evidence of design ideas being moved on and refined into a final design proposal that is different from the initial alternative ideas already presented, but will contain many of the best features considered previously. It is not acceptable to simply take an existing idea and offer it as a final proposal without further development.

Modelling is a feature of this criterion and is an important part of testing a proposed design against aspects of the specification. Many students used appropriate modelling materials, evidenced in photographs, to produce scale models of their designs and evaluated these against aspects of the product specification, while others used 3D CAD to model their designs and it is pleasing to see an increase in the use of CAD programs such as ProDESKTOP, Solid Works and 2D Design.

Review

This criterion was not well done in general. Most students annotated their work with descriptions and details of materials and processes, but did not review their designs against points of specification. To achieve high marks in this section, ideas should be formatively evaluated against the specification as they develop. Many students used tick boxes or marks out of ten to evaluate their designs, but these techniques do not offer any opportunity for objective explanation or justification of how a design achieves or fails to achieve a specification point.

Criterion 3

Use written and graphical techniques including ICT and CAD where appropriate to generate, develop, model and communicate.

Written communication, other media, ICT

As in other years, these assessment criteria were very well evidenced by the vast majority of students who are expert in the use of ICT particularly. Centres usually awarded marks appropriately, sometimes harshly, but never leniently. Good students used specialist technical vocabulary to communicate clearly and logically and presented their work using a range of media such as photographs, charts and tables, models, cut and paste information etc.

Most students are expert users of ICT and some excellent standards were seen in this regard. The use of 2D and 3D CAD and CAM continues to grow as centres become better equipped.

Criterion 4

Produce and use detailed working schedules, which include a range of industrial applications as well as the concepts of systems and control. Simulate production and assembly lines using appropriate ICT.

Systems and Control

This year, centres were much improved at presenting appropriate evidence in this criterion. Many more students were able to score full marks for their work than in previous years, by labelling or showing a key for the input(s), process(es), output(s) and feedback paths that identify where performance checks are made in an outline plan for production of their product. Some centres produced pre-printed, templated sheets for students to fill in, which was disappointing to see as this work was stereotyped and not 'owned' by students.

Schedule

Most students were able to produce a work schedule that included a sequence of manufacturing activities that related to time, but many gave no indication of quality control. Where time was mentioned, many students used the terms 'weeks' or 'lessons' without stating how long these periods were in real time. Where Gantt charts were used, some students failed to focus only on product manufacture, producing instead timings for the whole of the project.

It is useful to consider that schedule and systems and control concentrate on manufacturing rather than designing and can include details of tools, equipment and processes that can be used to evidence 'Select' in the 'Select and Use' assessment criterion.

Industrial Applications

Most centres are familiar with this criterion and assessed students accurately, where there was evidence that they had 'used' an industrial method in their work. The use of CAD machinery, vacuum forming equipment, jigs for repeated accuracy in multiple production, other machinery that would be used where repeatability was necessary such as routers, centre lathe (used beyond simple procedures), all fulfil the

requirements of 'using' an industrial application, as does the use of welding and brazing.

Criterion 5

Select and use tools, equipment and processes effectively and safely to make single products and products in quantity. Use CAM appropriately.

Select and Use

Moderators reported that a wide range of products and standards were seen and that the vast majority of centres awarded marks appropriately in this criterion. Most centres understand what evidence is required for 'Select' and this was successfully produced by the majority of students through sections such as systems and control and schedule, as well as through photographs, charts and detailed lists. Evidence for 'use skilfully', was presented in the form of detailed photographs that exemplified the skills and accuracy of construction achieved by individual students during the manufacture of their product.

A few of centres allowed students to pursue projects focused on the capabilities of laser cutting, and CD racks and flat faced acrylic clocks were often the outcome of this. Unfortunately, the production by machine of repeated unit shapes that only require simple assembly and no other skills cannot reach the higher marks in this assessment section as students must also demonstrate their ability to use the selected tools, equipment and processes with a high degree of skill and accuracy when making their product.

The inclusion of a series of clear photographs illustrating student's work was very helpful to the moderation process.

Make Products

When awarding marks in this section, centres were usually accurate. The quality of work seen was in general appropriate to Key Stage 4 expectations and the level of demand of projects chosen by students was appropriate for this course, allowing them the opportunity to access the full range of marks available. Unfortunately, some projects that were rewarded highly were inappropriate. It is expected that students of lower ability will produce work of lower demand, but it is not acceptable to award high marks for such work, as some centres did. In order to access higher marks in this section, students must make a high quality product which relates to most of the features of the design proposal, which means that there must be evidence of making a product that meets most of the quality requirements of the final design proposal in terms of sizes, tolerances, function, reliability and matches most details of materials, construction, fixtures, fittings and form.

Work Safely

Some students presented evidence for this criterion through Systems & Control, Schedule, photographs or a specific chart. Not many students scored in the high category of marks, as they failed to consider the safety of others working around them. Some centres awarded maximum marks and annotated the CMRB as 'teacher observation'. This approach is worth only the low mark and the statement must detail what has been observed. Explicit evidence must be presented for higher marks.

Criterion 6

Devise and apply tests to check the quality of students work at critical control points. Ensure that student's products are of suitable quality for the intended use. Suggest modifications that would improve the product's performance.

Tests and Checks

As in previous years, the majority of students struggled to achieve high marks in this section. Testing was not well described and was sometimes referred to as an intention to test, rather than describing tests that had been carried out. Testing was often subjective and superficial and was sometimes based on tests carried out and credited in 'Develop'. To access the high mark, students are required to develop and use appropriate testing techniques to check the performance or quality of a product against the measurable points of the specification after the product has been completed.

Evaluate

Many students appeared not to understand what is required in this criterion, making subjective and superficial comments and only briefly referring to the product specification or the tests and checks carried out previously. Some students included user views in their evaluations and this helped the objectivity of this section. Some centres used this section to reward students under 'Review', which was not acceptable.

Modifications

As was the case in previous years, most students were able to suggest some modifications that would improve their product, but many were cosmetic and did not focus on improving the performance or quality of the product.

Each modification suggestion should follow on from points of evaluation, which in turn should be linked to tests and checks.

GCSE Design and Technology: Resistant Materials Technology

Principal Examiner's Report - June 2008

1973, Paper 2F

General Comments

This is the sixth year that this specification has been examined. The specification tests candidates' knowledge and understanding of resistant materials and products, processes and the effects of producing and using them on society and the environment. The written paper tests their application of this knowledge and understanding through their responses to questions about products and the processes involved in their manufacture, both in the workshop and as part of large quantity production.

It remains the case that candidates' knowledge of processes continues to lack the depth and detail needed in order to be able to access the whole range of marks available on the paper. Candidates should be prepared for this examination using the specification as a guide to identify what has to be taught. It is not sufficient to rely upon and assume that candidates will gain sufficient knowledge and understanding through practical designing and making in their coursework. Candidates have to be taught on a more formal basis, the contents of the specification.

Most candidates performed reasonably well where questions were targeted at school workshop production and processes but where commercially produced products were introduced candidates showed limited knowledge. Where questions asked for an explanation or description candidates continue to give a reason and lose the second mark because they did not justify or qualify their answers; although in some centres this is clearly improving it remains an area where candidates' performance can be significantly improved. Notice should be taken of the information in the Teacher's Guide (pages 11 to 15) that gives clear guidance as to the distinct meaning of the wording and word hierarchy used in questions for this examination i.e. give/ state/ name/ describe/ explain. This should form part of the teaching practice to students in preparation for this paper. Centres are also reminded that candidates must write in pen rather than pencil, especially now that the papers are scanned, and that no correction fluid or pens should be used. Colour in the design responses is also to be discouraged. Candidates must also be encouraged to use only the space provided for their responses.

It must be stressed to candidates that the question needs to be read carefully in order to score marks, without wasting too much time on responses that do not score marks.

Foundation Tier

Most candidates showed a range of experiences throughout the paper and as a result could score some marks across all the questions. There were some obvious areas of materials and processes that were not covered by some centres which penalised their candidates.

There was no evidence to suggest that candidates had been entered for the wrong tiers this year and centres are demonstrating increasing expertise in preparing candidates for questions. There was also no evidence of centres or candidates misunderstanding the instructions. Candidates made responses to all questions suggesting that the length of the paper is correct but it was evident once again that a

fair proportion of candidates finished early.

It was obvious that some areas of the specification are not being taught to candidates in centres and as a result some centres disadvantaged their candidates. A similar criticism can be made, as it is evident that some centres are not teaching candidates about the properties of materials and the correct terminology / definitions. The design question was either well understood by candidates or there was very little evidence that candidates could produce two different ideas rather than one idea developed. In the design question, a proportion of candidates scored better than in previous years but some candidates were unable to make a reasonable attempt to evaluate their design in part 3(b). Question 4 was well answered and it is evident that centres are preparing candidates for product analysis reasonably thoroughly.

Question 1

(a)(i)

The use of the hammer, the tenon saw and the hand drill were well answered but the correct uses for the band saw and the lathe were not often given.

(a)(ii)

Uses were generally good but in some cases the responses were simply too generic: 'drilling' or 'sawing.'

(b)

Generally, quite well done with a large majority of candidates scoring at least one mark.

(c)

Generally well done but it is quite easy to see that some candidates simply took a guess.

(d)

A good number of pupils gave a correct response to this question with the majority giving were 'wear goggles', 'wear gloves' or 'use a face mask'.

(e)

This question was less well answered, on the whole, with few candidates gaining the maximum 4 marks available. A number of candidates described two appropriate advantages, but failed to extend their answers in order to explain the advantage and gain the second of the two marks for each answer given. Most popular response being 'easily scanned', 'quicker to use', 'can identify the product', 'update stock', though pupils struggled to give an explanation for their answers. Many candidates gave responses relating to shop sales rather than advantages to the manufacturer, so were unable to secure full marks.

(f)(i)

One method was usually given with few not scoring this mark point. 'Phones', 'email' and 'internet' being the most common answers.

(f)(ii)

The answers to this question were highly varied with marks ranging across all possible responses, but on the whole it seemed to provide candidates with the opportunity to show their knowledge and understanding. However, candidates again failed to explain their answers to get the 2 full marks. Most candidates gave the answers "faster", "quicker", "saves time".

Question 2

(a)

A good encouraging number of candidates scored well on this part.

(b)(i)

'Hard' and 'strong' were the most common answers for the properties of the metal, some answers relating to durability and waterproofing were given.

(b)(ii)

There were many correct answers given, mainly relating to contaminating food, looks and possible injury from eating rust particles.

(c)

'Will not rust' was one of the most common incorrect answers with a general lack of understanding of the term 'properties' being evident, in relation to the material. 'Waterproof' and 'easily moulded' being the most common answers.

(d)(i)

Generally answered with one reason given correctly, 'grip' the most common.

(d)(ii)

There were quite a few good descriptions in response to this question and spread through the responses given in the mark scheme. The most common incorrect response given was when candidates provided descriptions of injection moulding.

(e)(i)

This was a generally well answered question with 'landfill' and 'less mining for new materials,' the most common responses seen.

(e)(ii)

This question too was well answered by many with 'protect the workforce' and 'protect local residents' being the most common answers.

(f)(i)

'Cost' and 'consistency' were the most common responses to this question, 'ability to change program' being the most common wrong response.

(f)(ii)

This too was quite well answered with many correct responses referring to reduction of workforce and re-training.

Question 3

(a)(design idea 1)

A high number of candidates achieved good marks with Design Idea No 1. There was much creative thinking and those who had handled trophies were at a clear advantage. Candidates gained marks for writing 'Swimming winners' in their designs. Very simplistic, but effective in gaining marks. Most candidates provided a space for the winning school but a great many did not explain how they would fix this to the trophy. Stability is best assured by large base area however weaker explanations like long and flat will score less often. A high number of candidates had been able to name a specific material and did gain credit for this. Many still give the generic

'plastic', 'wood' or 'metal'. There was some evidence of lack of essential detail, such as dimensions and labelling. It was noticeable that a very high number of candidates did not give any evidence of a process.

(a)(design idea 2)

Too many candidates chose to repeat design idea 1 except they rearranged the positing of the words. Overall, little effort was made to radically change the ideas and the marks given for design idea 2 reflected this.

(b)(i)

Some candidates gave a good evaluation of their design, having a suitable indication of swimming and the winners, but there were still many who simply stated 'my design succeeds'.

(b)(ii)

There were not many scoring full marks for this part question as the space for the name of the winners was not fully thought through by candidates on their design.

(b)(iii)

Here too, those who had not given sufficient detail in their design did not score well, though there were a few good evaluations relating to stability. Lots thought that sanding the base smooth was sufficient to prevent damage to a surface even if it was metal!

Question 4

(a)(i)

The most common answer to this was 'looks nice' or 'attractive', with a reason being to 'increase sales'. There were a significant number who thought pricing was a suitable point.

(a)(ii)

'Material recycling' was the most common answer to protect the environment. Many incorrect answers, including 'saving water/fuel', 'fitting in with the customer's environment/décor'.

(a)(iii)

'Shiny surface/looks good', 'smooth finish to prevent injury', the most common answers. Many included BS specification which was incorrect.

(b)(i)

'Rust' was by far the most common response scoring the one mark.

(b)(ii)

'Aesthetics' and 'plating giving the impression of a more expensive material' were the most common correct answers to this part question.

(c)

There were many correct responses to this question usually 'waterproof', 'heat insulator' and 'colour' being the most often seen. Many incorrect responses referred to 'grip' or 'does not rust'.

(d)

'Dimensional accuracy' and 'colour match' were the most common answers with a few mentioning sharp edges. Many lost marks by relating the colour being applied to

hot and cold taps or making sure the red cap was fitted to the hot tap, and the blue cap fitted to the cold tap.

(e)

Very limited understanding of mould design with many relating to the ease with which moulds could be made, self finishing, the suitability of Injection moulding for fast repetitive production. Some answers mentioned the ability of the shape to release from the mould, but generally this was a poor set of responses to this question.

(f)(i)

Many responses to 'the shape having grooves to fit fingers' though there were also a significant number who thought acrylic had grip properties.

(f)(ii)

Quite a few did not refer to the inset cap so only scored a single mark for relating the colour to the hot and cold water.

GCSE Design and Technology: Resistant Materials Technology Principal Examiner's Report - June 2008 1973, Paper 2H

General Comments

This is the sixth year that this specification has been examined. The specification tests candidates' knowledge and understanding of resistant materials and products, processes and the effects of producing and using them on society and the environment. The written paper tests their application of this knowledge and understanding through their responses to questions about products and the processes involved in their manufacture, both in the workshop and as part of large quantity production.

It remains the case that candidates' knowledge of processes continues to lack the depth and detail in needed in order to be able to access the whole range of marks available on the paper. Candidates should be prepared for this examination using the specification as a guide as to identify what has to be taught. It is not sufficient to rely upon and assume that candidates will gain sufficient knowledge and understanding through practical designing and making in their coursework. Candidates have to be taught on a more formal basis, the contents of the specification.

Most candidates performed reasonably well where questions were targeted at school workshop production and processes, but where commercially produced products were introduced candidates showed limited knowledge. Where questions asked for an explanation or description candidates continue to give a reason and lose the second mark because they did not justify or qualify their answers, although in some centres this is clearly improving but this is an area where candidates' performance can be significantly improved. Notice should be taken of the information in the Teacher's Guide (pages 11 to 15) that gives clear guidance as to the distinct meaning of the wording and word hierarchy used in questions for this examination i.e. give/ state/ name/ describe/ explain. This should form part of the teaching practice to students in preparation for this paper. Centres are also reminded that candidates must write in pen rather than pencil, especially now that the papers are scanned, and that no correction fluid or pens should be used. Colour in the design responses is also to be discouraged. Candidates must also be encouraged to use only the space provided for their responses.

It must be stressed to candidates that the question needs to be read carefully in order to score marks, without wasting too much time on responses that do not score marks.

Higher Tier

It was evident that the majority of centres had entered candidates correctly for this tier of the examination. A number of candidates showed a greater understanding of what the key words in questions were asking of them i.e. give/ state/ name/ describe/ explain. This should form part of the teaching practice to students in preparation for this paper.

Question 1

(a)(i)

The most common answer to this was 'looks nice' or 'attractive' with a reason being to 'increase sales'. There were a significant number who thought 'pricing' was a suitable point.

(a)(ii)

'Material recycling' was the most common answer to protect the environment. Many incorrect answers including 'saving water/fuel' and 'fitting in with the customer's environment/décor'.

(a)(iii)

'Shiny surface/looks good', 'smooth finish to prevent injury' the most common answers. Many included BS specification which was incorrect.

(b)(i)

'Rust' was by far the most common response scoring the one mark.

(b)(ii)

'Aesthetics' and 'plating giving the impression of a more expensive material' were the most common correct answers to this part question.

(c)

There were many correct responses to this question, usually 'waterproof', 'heat insulator' and 'colour'. Many incorrect responses referred to 'grip' or 'does not rust'.

(d)

'Dimensional accuracy' and 'colour match' the most common answers with a few mentioning sharp edges. Many lost marks by relating the colour being applied to hot and cold taps or making sure the red cap was fitted to the hot tap, and the blue cap fitted to the cold tap.

(e)

Very limited understanding of mould design with many relating to the ease with which moulds could be made, self finishing, the suitability of Injection moulding for fast repetitive production. Some answers mentioned the ability of the shape to release from the mould but generally this was a poor set of responses to this question.

(f)(i)

Many responses to the 'shape having grooves to fit fingers' though there were also a significant number who thought acrylic had grip properties.

(f)(i)

Quite a few did not refer to the inset cap so only scored a single mark for relating the colour to the hot and cold water.

Question 2

(a)

'Copper' was by far the most common answer of the two materials named with 'iron' being a popular incorrect response.

(b)

The joint most often incorrectly named was the housing joint, followed by the mortise and tenon. The dowel joint being the most common correct answer, but it was pleasing to see a very good number of correct responses.

(c)(i)

The 3 risks were often correct, but the most common incorrect response being 'spillage' or 'staining on clothing'.

(c)(ii)

'Protect the steps' and 'show the grain of the wood' were the most common answers. Many did not give a full explanation to this question, merely saying the appearance was enhanced or it was more durable. This sort of response is a classic example where candidates fail to secure the full marks available because of a lack of an explanation.

(d)

'Accuracy' and 'can run 24/7' were the most common answers with a fair few indicating 'fewer workers' or 'faster than manual labour', scoring 2 out of the 3 marks available.

(e)

Here, too many candidates did not justify their answer so scoring only 1 of the 2 marks available. 'Falling off the step' or 'the step breaking' being the most common answers with 'size' being seen fairly regularly.

(f)

Here too the concept of the 'explain' was missed by many candidates with many responses scoring 1 of the 2 marks available as a result. 'Faster than post', 'easy to amend' and 'able to load into CAM' being the most common responses, but could all have scored better with a full justification.

Question 3

(a)(design idea 1)

Some good designs with all features of the specification included. The handle was often not suitable or misplaced to aid ease of carry. There were a wide range of arrangements for the 8 compartments and lids/locking devices too. Common errors included designs which were hand held, too few compartments and no material or process suitable for volume production. Some candidates had named materials and an unsuitable production process (injection moulding iron!!). Some candidates designed units for 8 single screws of different size and others designed units to hold screwdrivers.

(a)(design idea 2)

Often not sufficiently dissimilar to idea 1 so losing marks. Lack of detail or information to explain designs was common in idea 2.

(b)

Some very sketchy evaluation with a lot of repetition of the question stem. 'My design has a handle so can be carried as the material is light,' was a common response with no comments or qualification as to size or position of the handle to allow ease of carrying given. Likewise, 8 compartments with no comment on size or ease of access. The method of dividing the sections was well answered as was a fitting lid preventing loss of the screw during transportation.

Question 4

(a)

'Hard', 'dense' and 'durable' were the 3 most common answers. Many gave 'hardwood' as a property.

(b)

Well answered, with many knowing chipboard absorbs water and would rot or break quickly.

(c)

The most common response relating to steel was 'being able to be driven into the ground', followed by 'it will last longer'.

(d)

The properties of materials seemed to be guessed at by a number of candidates. Many candidates gave correct answers such as 'flexibility', 'lightweight' and 'waterproof'.

(e)

Here again the 'explain' response was not commonly understood. Many examples from the mark scheme scoring only 1 of the 2 marks available. Many incorrect 'you can recycle/reuse materials' with no further response.

(f)

Very limited knowledge of planned obsolescence with many guesses. 'Expense to the consumer' being the most common correct answer.

(g)

Not well answered with candidates referring to moral values on cultural, religious grounds. 'Disposal', 'waste of energy/materials' and 'peer pressure' being the most common answers.

GCSE Design and Technology: Resistant Materials Technology Principal Examiner's Report - June 2008 3973, Paper 01 (Short Course Coursework)

General Comments

Only eight centres submitted work for moderation in the short course in Resistant Materials Technology this year. Most students performed well and nearly all centres awarded marks accurately or slightly harshly, so it was pleasing to be able to increase the marks of some students who were under-marked and had worked hard to achieve success in this subject. The majority of students' work reflected the 20 hour allowance for coursework completion, but it was obvious from the high quality and complex outcomes of some work that the recommended time limit had been significantly exceeded. In these cases, students would have fared well in the full course. In one case, work was submitted seven weeks after the deadline for handing in coursework, without any reason for doing so. This is not acceptable, and put those candidates at risk of being marked down as 'absent'; not complying with deadlines can give students an unfair advantage over students in other centres who all complied with the stipulated deadline.

One or two centres used Edexcel's approved 'task sheets', which were helpful in organising portfolios and keeping the number of sheets students used down in quantity and avoiding needless padding. Within these centres, students showed ingenuity and skills in attaching 'fold-out' additions to sheets in order to extend the space in which to present their work.

Almost all centres presented a range of good quality photographs to support marks awarded to students and this was extremely helpful during moderation, particularly in assessment areas such as 'Select and Use', 'Make Products' and 'Testing'.

Although most centres awarded marks accurately, where discrepancies between centre and moderator marks occurred, this was almost always in criterion 2 - design and develop.

Administration

The vast majority of centres followed Edexcel's instructions and procedures efficiently, with few problems although moderators reported some difficulties in the following areas of administration:

- Addition errors in CMRBs
- Errors in transferring marks from CMRBs to OPTEMS
- No annotation in CMRBs

Criterion 1

Information

Most students were able to score marks well in this assessment section and were able to achieve at least the medium level of reward. It is essential that a high degree of selectivity is applied to the information collected, which should be from more than two sources, so that it is appropriate and useful when writing the specification and producing designs.

Specification

Most students were able to write specifications that contained some focused and relevant statements, but a significant number of statements were superficial and general and lacked measurable content that could be used in evaluating the final product. The specification should include reference to form, function, user requirement and budgetary constraints and should contain points that have developed from information gathered previously.

Criterion 2

Ideas

This was generally the weakest area of response from most students. A significant number produced weak work in this criterion and many settled on the first idea they produced, which limited their potential to gain marks. There was some high quality work, which included consideration of the product specification and offered several alternative ideas that were detailed and realistic, but this was in the minority. It is important to understand that the same standards of D&T competency are expected for the grades range in the short course, as in the full course, but it is also expected that students will produce less work to achieve them.

Develop

When developing ideas, some excellent modelling was in evidence in the form of 3D CAD and physical construction, and students used this to good effect when developing their final design proposal. Unfortunately, some students seemed not to understand the concept of development and were satisfied to use a previously created idea and repeat it in full in this section. Develop means 'change' and this should be reflected by seeing the final design proposal emerging from the range of previous ideas that have been produced, and containing the best features of these. Develop should also include details of dimensions, materials, processes and equipment to be used during product manufacture.

There should be enough information presented in this section to enable a skilled third-party to make the product without further reference to the designer.

Criterion 3

Written Communication

As in previous years, in this assessment section, the majority of students scored high marks through their logical use of appropriate technical vocabulary. Only a few students were unfamiliar with terminology and descriptive terms relating to their proposed product.

In order to score high marks, the necessary information that relates to the product should be clearly communicated so that the reader can readily understand all of the information presented without making assumptions about what may or may not be meant by particular statements.

Other Media and ICT

The majority of students are expert users of ICT and were able to score well in this section through their use of appropriate computer packages and their ability to present work using media such as photographs/cut-outs/models/mock-ups have been used to inform the development/evaluation of ideas already presented. More than one form of ICT should be used to generate, develop, model or communicate information or ideas relevant to their product.

Criterion 4

Systems and Control

This criterion was better understood this year and most students managed to score well in combination with schedule. In this assessment section, students should produce an outline plan for one manufacturing activity for their product. The plan should explain (label) the input(s), the process(es), the output(s) and feedback of the activity to show where performance / quality checks will be triggered. An indication of the correct sequence of operations undertaken during the manufacturing activity that relates time and quality control should also be included. Where time plans are used (Gantt charts or similar), they should only focus on product manufacture and should not include the whole design, make, evaluate activity.

Industrial Applications

This criterion was generally well marked by centres who now understand what is required to achieve full marks. Students only require evidence of having used a single industrial method in their product manufacture in order to gain the high mark in this criterion. Appropriate industrial methods can be said to be the use of processes, equipment and machinery found in commercial activities that allow accurate, repeated production to take place e.g. CNC equipment, vacuum forming, use of jigs, router etc. and including welding and brazing.

Criterion 5

Select and Use

In this criterion, students presented some excellent work that was supported by clear photographs that gave detailed information about the quality of work produced. Overall, centres awarded marks consistently and in line with Edexcel's standards. Almost all project work taken to a final conclusion was of an appropriate level of demand for the short course in GCSE Resistant Materials Technology. Only a few students were over rewarded in this assessment section for work that was undemanding and inappropriate. Where CNC equipment is used, centres should ensure that there are plenty of other opportunities within a piece of work for students to demonstrate their potential. In this criterion, students should present evidence of having selected most tools equipment and processes that are appropriate and necessary for carrying out the various tasks involved in making their product.

Make Products

As was the case last year, most projects were appropriate to the level of complexity demanded for this course and this allowed students access to the full range of marks available. In this assessment section, students should provide evidence of making a product that meets most of the quality requirements of their final design proposal in terms of sizes, tolerances, finish, and function. The complexity of the product

should reflect the shorter time available to students entered for the short course, in that there should be evidence of challenging making work, but there should be less of it than in the full course.

Criterion 6

Tests and checks

Once again this year, students found difficulty in knowing what to include in this assessment section. Testing was not well described and was sometimes referred to as an intention to test, rather than describing tests that had been carried out. Testing was often subjective and superficial and was sometimes based on tests carried out and credited in 'Develop'. To access the high mark, students are required to develop and use appropriate testing techniques to check the performance or quality of a product against the measurable points of the specification after the product has been completed.

Evaluate

Many students appeared not to understand what is required in this criterion, making subjective and superficial comments and only briefly referring to the product specification or the tests and checks carried out previously. Some students included user views in their evaluations and this helped the objectivity of this section.

When presenting evidence in this assessment section, students should use their test results and the views of potential users to assist in the evaluation of their product. The evaluation should relate to some of the measurable points of the product specification and should be as objective as possible, with most statements being supported with evidence.

When considering modifications, students should present more than one suggestion for changes. Each suggestion should arise from a different evaluation point and should include reasons for the proposed improvements.

GCSE Design and Technology: Resistant Material Technology

Principal Examiner's Report - June 2008

3973, Paper 2F (Short Course)

General Comments

This is the sixth year that this specification has been examined. The specification tests candidates' knowledge and understanding of resistant materials and products, processes and the effects of producing and using them on society and the environment. The written paper tests their application of this knowledge and understanding through their responses to questions about products and the processes involved in their manufacture, both in school and as part of large quantity production.

It remains the case that candidates' knowledge of processes continues to lack the depth and detail needed in order to be able to access the whole range of marks available on the paper. Candidates should be prepared for this examination using the specification as a guide as to identify what has to be taught. It is not sufficient to rely upon and assume that candidates will gain sufficient knowledge and understanding through practical designing and making in their coursework. Candidates have to be taught on a more formal basis, the contents of the specification.

Most candidates performed reasonably well where questions were targeted at school workshop production and processes but where commercially produced products were introduced candidates showed limited knowledge. Where questions asked for an explanation or description candidates continue to give a reason and lose the second mark because they did not justify or qualify their answers, although in some centres this is clearly improving but this is an area where candidates' performance can be significantly improved. Notice should be taken of the information in the Teacher's Guide (pages 11 to 15) that gives clear guidance as to the distinct meaning of the wording and word hierarchy used in questions for this examination i.e. give/ state/ name/ describe/ explain. This should form part of the teaching practice to students in preparation for this paper. Centres are also reminded that candidates must write in pen rather than pencil, especially now that the papers are scanned, and that no correction fluid or pens should be used. Candidates must also be encouraged to use only the space provided for their responses.

It must be stressed to candidates that the question needs to be read carefully in order to score marks, without wasting too much time on responses that do not score marks.

Foundation Tier

Most candidates showed a range of experiences throughout the paper and as a result could score some marks across all the questions. There were some obvious areas of materials and processes that were not covered by some centres which penalised their candidates.

There was no evidence to suggest that candidates had been entered for the wrong tiers this year and centres are demonstrating increasing expertise in preparing candidates for questions. There was also no evidence of centres or candidates misunderstanding the instructions. Candidates made responses to all questions suggesting that the length of the paper is correct but it was evident once again that a

fair proportion of candidates finished early. It was obvious that some areas of the specification are not being taught to candidates in centres and as a result some centres disadvantaged their candidates. A similar criticism can be made, as it is evident that some centres are not teaching candidates about the properties of materials and the correct terminology / definitions. Question 3 was well answered and it is evident that centres are preparing candidates for product analysis reasonably thoroughly.

Question 1

(a)(i)

The uses of the hammer, the tenon saw and the hand drill were well answered.

(a)(ii)

Uses were generally good, but in some cases the responses were simply too generic: 'drilling' or 'sawing'.

(b)

Generally, quite well done with a large majority of candidates scoring at least one mark.

(c)

Generally well done but it is quite easy to see that some candidates simply took a guess.

(d)

A good number of pupils gave a correct response to this question with the majority giving 'wear goggles', 'wear gloves' or 'use a face mask'.

Question 2

(a)

A good encouraging number of candidates scored well on this part.

(b)(i)

'Hard' and 'strong' were the most common answers for the properties of the metal, some answers relating to durability and waterproofing were given.

(b)(ii)

There were many correct answers given, mainly relating to contaminating food, looks and possible injury from eating rust particles.

(c)

'Will not rust' was one of the most common incorrect answers with a general lack of understanding of the term 'properties' being evident, in relation to the material. 'Waterproof' and 'easily moulded' being the most common answer.

(d)(i)

Generally answered with one reason given correctly, 'grip' the most common.

(d)(ii)

There were quite a few good descriptions in response to this question and spread through the responses given in the mark scheme. The most common incorrect response given was when candidates provided descriptions of injection moulding.

Question 3

(a)(i)

The most common answers to this were 'looks nice' or 'attractive' with a reason being to 'increase sales'. There were a significant number who thought pricing was a suitable point.

(a)(ii)

'Material recycling' was the most common answer to protect the environment. Many incorrect answers including 'saving water/fuel' and 'fitting in with the customers environment/décor'.

(a)(iii)

'Shiny surface/looks good', 'smooth finish to prevent injury' the most common answers. Many included BS specification which was incorrect.

(b)(i)

'Rust' was by far the most common response scoring the one mark.

(b)(ii)

'Aesthetics' and 'plating giving the impression of a more expensive material' were the most common correct answers to this part question.

(c)

There were many correct responses to this question usually 'waterproof', 'heat insulator' and 'colour' being the most often seen. Many incorrect responses referred to 'grip' or 'does not rust'.

(d)

'Dimensional accuracy' and 'colour match' the most common answers with a few mentioning sharp edges. Many lost marks by relating the colour being applied to hot and cold taps or making sure the red cap was fitted to the hot tap, and the blue cap fitted to the cold tap.

(e)

Very limited understanding of mould design with many relating to the ease with which moulds could be made, self finishing, the suitability of Injection moulding for fast repetitive production. Some answers mentioned the ability of the shape to release from the mould but generally this was a poor set of responses to this question.

(f)(i)

Many responses to the 'shape having grooves to fit fingers' though there were also a significant number who thought acrylic had grip properties.

(f)(i)

Quite a few did not refer to the inset cap so only scored a single mark for relating the colour to the hot and cold water.

GCSE Design and Technology: Graphic Products

Principal Examiner's Report - June 2008

3973, Paper 2H (Short Course)

General Comments

This is the sixth year that this specification has been examined. The specification tests candidates' knowledge and understanding of resistant materials and products, processes and the effects of producing and using them on society and the environment. The written paper tests their application of this knowledge and understanding through their responses to questions about products and the processes involved in their manufacture, both in school and as part of large quantity production.

It remains the case that candidates' knowledge of processes continues to lack the depth and detail needed in order to be able to access the whole range of marks available on the paper. Candidates should be prepared for this examination using the specification as a guide as to identify what has to be taught. It is not sufficient to rely upon and assume that candidates will gain sufficient knowledge and understanding through practical designing and making in their coursework. Candidates have to be taught on a more formal basis, the contents of the specification.

Most candidates performed reasonably well where questions were targeted at school workshop production and processes but where commercially produced products were introduced candidates showed limited knowledge. Where questions asked for an explanation or description candidates continue to give a reason and lose the second mark because they did not justify or qualify their answers, although in some centres this is clearly improving but this is an area where candidates' performance can be significantly improved. Notice should be taken of the information in the Teacher's Guide (pages 11 to 15) that gives clear guidance as to the distinct meaning of the wording and word hierarchy used in questions for this examination i.e. give/ state/ name/ describe/ explain. This should form part of the teaching practice to students in preparation for this paper. Centres are also reminded that candidates must write in pen rather than pencil, especially now that the papers are scanned, and that no correction fluid or pens should be used. Candidates must also be encouraged to use only the space provided for their responses.

It must be stressed to candidates that the question needs to be read carefully in order to score marks, without wasting too much time on responses that do not score marks.

Higher Tier 2H

It was evident that the majority of centres had entered candidates correctly for this tier of the examination. A number of candidates showed a greater understanding of what the key words in questions were asking of them i.e. give/ state/ name/ describe/ explain. This should form part of the teaching practice to students in preparation for this paper. Centres are also reminded that candidates must write in pen rather than pencil and that no correction fluid or pens should be used. Candidates must also be encouraged to use only the space provided for their responses.

Question 1

(a)(i)

The most common answers to this were 'looks nice' or 'attractive' with a reason being to 'increase sales'. There were a significant number who thought pricing was a suitable point.

(a)(ii)

'Material recycling' was the most common answer to protect the environment. Many incorrect answers including 'saving water/fuel' and 'fitting in with the customers environment/décor'.

(a)(iii)

'Shiny surface/looks good', 'smooth finish to prevent injury' the most common answers. Many included BS specification which was incorrect.

(b)(i)

'Rust' was by far the most common response scoring the one mark.

(b)(ii)

'Aesthetics' and 'plating giving the impression of a more expensive material' were the most common correct answers to this part question.

(c)

There were many correct responses to this question, usually 'waterproof', 'heat insulator' and 'colour'. Many incorrect responses referred to 'grip' or 'does not rust'.

(d)

'Dimensional accuracy' and 'colour match' the most common answers with a few mentioning sharp edges. Many lost marks by relating the colour being applied to hot and cold taps or making sure the red cap was fitted to the hot tap, and the blue cap fitted to the cold tap.

(e)

Very limited understanding of mould design with many relating to the ease with which moulds could be made, self finishing, the suitability of Injection moulding for fast repetitive production. Some answers mentioned the ability of the shape to release from the mould but generally this was a poor set of responses to this question.

(f)(i)

Many responses to the 'shape having grooves to fit fingers' though there were also a significant number who thought acrylic had grip properties.

(f)(ii)

Quite a few did not refer to the inset cap so only scored a single mark for relating the colour to the hot and cold water.

Question 2

(a)

'Copper' was by far the most common answer of the two materials named with 'iron' being a popular incorrect response.

(b)

The joint most often incorrectly named was the housing joint, followed by the mortise and tenon. The dowel joint being the most common correct answer, but it was pleasing to see a very good number of correct responses.

(c)(i)

The 3 risks were often correct, but the most common incorrect response was 'spillage' or 'staining on clothing'.

(c)(ii)

'Protect the steps' and 'show the grain of the wood' were the most common answers. Many did not give a full explanation to this question merely saying the appearance was enhanced or it was more durable. This sort of response is a classic example where candidates fail to secure the full marks available because of a lack of an explanation.

Question 3

(a)

'Hard', 'dense' and 'durable' were the three most common answers, with many giving 'hardwood' as a property.

(b)

Well answered with many knowing chipboard absorbs water and would rot or break quickly.

(c)

The most common response relating to steel 'being able to be driven into the ground', followed by 'it will last longer'.

(d)

The properties of materials seemed to be guessed at by a number of candidates. Many correct answers giving flexibility, lightweight and waterproof as the most frequent responses.

**GCSE Design & Technology: Graphic Products
(Full Course: 1973)**

Grade Boundaries - Summer 2008

Overall Grades

The figures given below are the minimum subject marks required for each overall grade in the summer 2008 examinations.

(Foundation Tier out of 100)

C	D	E	F	G
52	43	34	25	16

(Higher Tier out of 100)

A*	A	B	C	D	E
81	70	59	49	40	35

Component Marks

The figures given below are the minimum marks required for each component grade in the summer 2008 examination.

(Coursework 01 out of 102)

A*	A	B	C	D	E	F	G
92	80	68	56	45	34	23	12

(Paper 2F out of 88)

C	D	E	F	G
46	39	32	26	23

(Paper 2H out of 88)

A*	A	B	C	D	E
60	52	44	36	29	25

**GCSE Design & Technology: Graphic Products
(Short Course: 3973)**

Grade Boundaries - Summer 2008

Overall Grades

The figures given below are the minimum subject marks required for each overall grade in the summer 2008 examinations.

(Foundation Tier out of 100)

C	D	E	F	G
53	41	30	19	8

(Higher Tier out of 100)

A*	A	B	C	D	E
80	69	58	48	39	34

Component Marks

The figures given below are the minimum marks required for each component grade in the summer 2008 examination.

(Coursework 01 out of 84)

A*	A	B	C	D	E	F
76	66	56	46	37	28	19

(Paper 2F out of 44)

C	D	E	F	G
22	18	15	12	9

(Paper 2H out of 44)

A*	A	B	C	D	E
29	25	21	17	14	11

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