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ASSESSMENT and QUALIFICATIONS ALLIANCE

Report on the Examination

Design and Technology:
Resistant Materials Technology

- Full Course
- Short Course

GCSE – 3545/3555)

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Design and Technology: Resistant Materials Technology

Administration

Most centres complied with AQA's instructions relating to the collation, packaging and dispatch of scripts. There were, however, a number of centres that in one or more ways contravened the regulations, which in turn resulted in difficulties for the examiners. The following examples highlight these difficulties:

(i) Failure to use first class letter post to despatch scripts;
(ii) Failure to sort scripts into attendance order;
(iii) Candidate details either omitted or incorrectly recorded on the script;
(iv) Incorrectly submitting the sheet of colour photographs with the script.

In addition, a number of candidates contravened the regulations with regard to the use of correction fluid and the colour of ink employed to record their answer.

General

It is pleasing to note that examiners reported that there appeared to be substantial evidence of the increased use of the preparation material by centres when preparing their candidates for the examination.

The use of the preparation material is intended to give the candidates 'ownership' of their paper. It allows them to produce real and valid responses based on work done in the weeks before the examination. It is anticipated and intended that teachers should have full involvement when preparing candidates for the examination by fully utilising the preparation material. Where centres had made good use of the preparation material their candidates invariably went on to produce high quality scripts. However, centres and/or candidates who failed to take advantage of the preparation material generally found themselves disadvantaged.

The quality of sketching was found to be particularly good in most centres. The use of rendered, well-annotated, pictorial views is now the norm rather than the exception.

There was some evidence of candidates misinterpreting questions. Teachers should emphasise good examination techniques to their candidates, in particular; the need to read and re read each question carefully before attempting it. They should also be taught to use any 'spare' time at the end of the examination to carefully go through both the questions and their answers.

The fact that the least well answered questions were the ones which required candidates to show their knowledge of making processes is a real cause for concern. Centres should be aware that this type of question will remain a feature of this specification and must prepare their candidates accordingly.

Full Course

Foundation (3545 F)

Question 1

There was evidence of a few candidates misinterpreting this question; they gave a list of design requirements for garden tools rather than design requirements of a garden tool transporter. However, the majority of candidates answered this question well.

Many candidates gained full marks by producing four relevant specification points for a garden tool transporter and subsequently went onto expand their answer and provide a suitable explanation for each.

Candidates gained marks by using information given in the brief and elaborated upon it. Typically correct answers covered 'safety issues', 'durability', and 'suitability for outside use'.

Candidates missed marks by repeating answers already given.

Question 2

The majority of candidates answered this question well. It was clearly evident that they had obviously worked with the preparation material and have subsequently gone on to produce quality responses.

- **Variety of Ideas**

  Many candidates were able to access high marks by showing three **different** ideas. Many candidates were able to demonstrate their creative ability by producing original designs. There were few copies of existing products. Even basic 'wheelbarrow' ideas had been manipulated and developed.

- **Quality of sketching**

  The standard of sketching was generally good. Many candidates made an attempt at producing a pictorial view of their idea. The majority of 2D line drawings were clear and in proportion. There was good use of colour/rendering techniques.

- **Quality of notes**

  The quality of annotation varied considerably. Most candidates chose to provide simple notes to describe the features of their ideas. Weaker candidates simply labelled the parts of their design, whilst higher marks were awarded to candidates who provided detailed notes regarding the function of their designs.

Question 3

(a) Most candidates were able to gain one of the two marks on offer by showing some measure of analytical thinking. Many went on to analyse a number of features of their design and gained full marks. Weaker candidates simply listed features of their design without making any value judgements, or made simple statements e.g. 'I like this one best'.

(b) Candidate's responses to this question were weak. Candidates did not display detailed knowledge of suitable method of constructing their design. Basic making skills were not demonstrated. Correct tool terminology was not used by the candidates.

Most candidates chose to provide details of how their design would be assembled, generally achieving half marks or less.

Weaker candidates simply repeated their best idea.

Question 4

(a) A few candidates misinterpreted this question. They related their answers to the style of the text, rather than the properties of given material. Common correct responses related to the self-adhesive vinyl being 'waterproof' and 'durable'. Many went on to explain their answers and thus gained full marks.

(b) This part of the question was particularly well answered. Almost all candidates knew of two was in which the text had been manipulated. Common correct responses included 'the writing has been made bigger' and 'the font has been changed'.

(c) Most candidates knew of two generic advantages of the label being manufactured by a computer aided machine. Many went on to explain their answer and gained full marks. Common correct responses referred to 'accuracy', 'speed' and 'quality'.

(d) There was a varied response to this question. Many candidates were uncertain of the term Quality Control and provided incorrect answers. Some candidates knew of one or two Quality Control checks which would be carried out during the design and manufacture of the label. Few candidates went on to explain their answer and gain full marks.

Question 5

(a) A very well answered question. Most candidates were able to give two correct reasons why the tools should not be used with out handles. Many went onto explain their answer gaining full marks. Common correct responses referred to the person injuring themselves or the tools being difficult or uncomfortable to use.

(b) Almost all candidates produced a design for an ergonomically shaped handle. Many designs contained numerous ergonomic features and gained the candidates full marks.

(c) Most candidates gained some of the marks on offer by explaining one of their ergonomic features; few successfully named and explained two reasons. Correct responses referred to 'the grip' and 'control of the handle'.

Question 6

This question was generally well answered. Candidates were able to demonstrate a sound knowledge of materials and finishes.

(a) Garden furniture A

Most candidates correctly identified that garden furniture A was made from 'wood' and many chose a specific type of wood which gained them an extra mark. 'Pine' and 'Teak' were the most popular correct specific materials chosen.
Reference to its 'appearance' and 'strength' were generally given as correct reasons for choosing this material.

Garden furniture B

Most candidates correctly identified that garden furniture B was made of 'plastic'. Many chose a specific type of plastic which gained them an extra mark. 'PVC' was the most popular correct specific material chosen.
Reference to it being 'waterproof' was generally given as correct reasons for choosing this material.

Garden furniture C

Most candidates correctly identified that garden furniture C was made from 'metal'. Many chose a specific metal which gained them an extra mark. 'Steel' and 'aluminium' were the most popular specific materials chosen.
Reference to its 'strength' and 'durability' were generally given as correct reasons for choosing this material.

(b) Garden furniture A

Most candidates gave a suitable specific finish which could be applied to garden furniture A. 'Varnish' and 'Teak oil' were the most popular correct specific finishes chosen.

Garden furniture C

Many candidates correctly chose 'polish' or 'lacquer' as a correct method of finishing garden furniture C. The finishes must have related to the chosen material for the candidate to be awarded a mark.

(c) Most candidates knew of two reasons why garden furniture B would not need a finish to be applied. Common correct responses referred to it being 'self coloured', 'waterproof' and 'shiny'.

Question 7

(a) Very well answered, with most candidates being able to formulate questions which they would include in a survey to find out which type of furniture a customer would prefer. A small number of candidates misinterpreted the question and simply gave statements about the furniture.

(b) Most candidates knew of two advantages that plastic garden furniture has over wooden. Many explained their answers and gained full marks. Common correct responses referred to it as being 'waterproof' and 'maintenance free'.

Question 8

(a) Most candidates successfully gave two advantages of packaging garden furniture in flat pack form. Few were able to supply a third reason. References to the ease of transportation and ease of storage were common correct responses.

(b) The symbols which are displayed on the outside of a flat pack box were generally well understood. The most common mistake being to assume that the umbrella stood for waterproof. The reason for having to stack 'this way up' was also found challenging for some candidates.

Question 9

A very well answered question. Most candidates were able to relate the 'Risk to user' to the given hazard. The 'precaution' caused a problem for some candidates. Common incorrect responses included 'use a fire extinguisher' or 'run away, very fast'! which are not precautions for adhesive catching fire.

Question 10

(a) Most candidates failed to gain marks here due to misinterpreting the question. They related their answers to the properties of a seed tray rather than to the given material. Common correct responses referred to flexibility, ease of cleaning and waterproof.

(b) There was a popular misconception that the drawing was an upside down seed tray rather than a former/mould. There was an obvious lack of knowledge of vacuum forming. Few marks were gained on this part of the question.

(c) Again candidates displayed a lack of knowledge of the use of a former/mould and were therefore unable to suggest a suitable material from which one would be made. Many candidates, again, referring to the actual seed tray

(d) Most candidates were able to successfully complete Stages 1 and 6 of the table, showing some understanding of the vacuum forming process. However, few attained full marks.

Full Course

Higher (3545 H)

Question 1

(a) This question was well answered. Many candidates gained full marks by producing three relevant specification points for a garden tool transporter and subsequently expanding their answers to provide suitable explanations.

(b) This question was well answered. Many candidates gained full marks by producing two relevant specification points for a garden tool transporter which were specifically related to the needs of the frail and elderly. They subsequently went onto expand their answer and provide a suitable explanation.

Candidates failed to gain marks by repeating answers already given.

Question 2

A very well answered question. It was clearly evident that the majority of teachers and candidates had obviously worked with the preparation material.

- **Variety of Ideas**

  Many candidates were able to access high marks by showing three **different** ideas. An increasing number of candidates were able to demonstrate their creative ability by producing original designs.

- **Quality of sketching**

  The standard of sketching was very impressive. Most candidates were able to produce a pictorial view of their idea, with many displaying fully rendered pieces of artwork.

- **Quality of notes**

  An increasing number of candidates are gaining full marks by providing detailed notes regarding the function of their designs, rather than simple labelling.

- **Quality of evaluation**

  Most candidates were able to gain one of the two marks on offer by showing some measure of analytical thinking. Many went on to analyse a number of features of their design and gained full marks. Weaker candidates simply listed features of their design without making any value judgements, or simply stated that their design fulfilled the design requirements, making no further comment.

Question 3

Candidate's responses to this question were weak. Candidates did not display detailed knowledge of suitable method of constructing their design. Basic making skills were not demonstrated. Correct tool terminology was not used by the candidates.

Most candidates chose to provide details of how their design would be assembled, generally achieving half marks or less.

Question 4

This question highlights an issue for a number of centres. Computer aided design (CAD) and computer aided manufacture (CAM) are embedded in our specification and it is essential that this vital area of the subject is addressed. It is preferable that the candidates should have 'first hand' experience but there are other ways of teaching and accessing CAD/CAM.

(a) This part of the question was generally well answered. Many candidates correctly referred to 'resistance to weather, durability, ease of application and suitability for batch production' as factors which had affected the choice of self adhesive vinyl as a suitable material from which to make the sticker.

(b) Design:

Many candidates gained half marks by making reference to details of text manipulation. Few candidates gained full marks by providing names of suitable software packages. E.g. Techsoft 2-D design, Dr.Stika.

Manufacture:

Candidates gained some marks by making reference to generic terms concerning the use of computer aided manufacture (CAM) e.g. 'suitability for batch production', 'accuracy' and 'speed'. However, few candidates gained full marks by providing details of an actual process which would be used to manufacture the sticker.

(c) Candidates provided a full range of responses to this part of the question. Weaker candidates employed a robot to stamp the sticker onto the tool transporter whilst it travelled past on a conveyer belt. Many candidates gained higher marks by providing details of jigs, masks and templates which could be utilised to ensure the sticker was accurately positioned on to the tool transporter. Higher level thinking was evidenced by candidates who give details of recesses or raised surfaces on the body of the tool transporter, to which the sticker would be applied.

Question 5

(a) Many candidates were able to relate anthropometrical data to the size of the human body. Few gained full marks by referring to how it would specifically have influenced the design of the garden tools.

(b) This part of the question was well answered by candidates. Most were able to identify, and provide details, of a number of ergonomic features of the garden tools. Common correct responses referred to the 'handles', 'switches 'and 'safety guards'.

Question 6

Teachers and candidates are reminded that only **specific** materials will be awarded marks on this paper.

(a) Garden furniture A

Most candidates correctly named a specific type of wood from which the furniture was likely to have been made from. The most popular answer being 'pine' and 'teak'.

Reference to its 'appearance' and 'strength' were generally given as correct reasons for their choice.

Garden furniture B

Most candidates provided a correctly named plastic as being a suitable material from which the furniture was likely to have been made from. 'PVC' being the most common, correct, response. Reference to it being 'waterproof' and 'colourful' were generally given as correct reasons for there choice.

Garden furniture C

Most candidates correctly named 'steel' or 'aluminium' as being suitable, specific materials from which the furniture was likely to have been made from.

Reference to its 'strength' and 'durability' were generally given as correct reasons for their choice.

(b) Most candidates gave a suitable specific finish which could be applied to the garden furniture A. 'varnish' and 'teak oil' were the most popular correct responses.

Most candidates gave a suitable specific finish which could be applied to the garden furniture C. 'Polish' and 'lacquer' were the most popular correct responses

(c) Many candidates gained some marks for providing information relating to injection mould being an expensive process to set up. Few candidates went on to expand their answer to gain full marks.

Question 7

This question was answered well by candidates. It is encouraging to see that the centres are addressing the less obvious areas of the specification.

(a) Most candidates knew of a suitable, specific material for a flat pack. 'Cardboard' being a popular correct response

(b) Most candidates knew of one advantage and one disadvantage to the customer of selling garden furniture as a flat pack, 'ease of transportation by car' being the most popular advantage. 'having to take time to assemble it yourself', being the most popular disadvantage chosen by the candidates.

(c) Many candidates correctly gave 'ease of transportation' and 'reduced costs' as being correct advantages to the manufacturer of selling garden furniture as flat pack.

(d) Almost all candidates knew of two symbols which you could find on flat pack furniture. 'safety', 'tools required', 'this way up' and 'fragile' being the most common correct responses.

(e) Most candidates gained at least half marks by making reference to 'ease of reading' and 'universal recognition' as correct reasons as to why information is provided in symbol form. Weaker responses included details of it being 'cheaper' and 'faster' to print a symbol rather than print words.

Question 8

This question was, generally, poorly answered. Knowledge of the vacuum forming process was weak or completely lacking.

(a) Many candidates correctly named a suitable, specific plastic from which to make the seed tray. 'PVC' being the most popular correct response.

(b) Few candidates correctly identified three important features of the mould/former. Common incorrect responses referred to the actual seed tray rather than the mould/former. These included. 'holes, to let the water out of the tray'

(c) Few candidates knew of a suitable specific material from which to make the mould/former. Again many, incorrectly, confused the mould/former with the actual seed tray.

(d) Candidates gained some marks on this part of the question even though they had shown little evidence of the vacuum forming process during the previous parts of the question. Common correct responses to the problem of webbing included 'plastic is too hot', 'plastic is too cold' and 'vacuum is not strong enough'.

Short Course

Foundation (3555 F)

Question 1

A few candidates misinterpreted this question; they gave a list of design requirements for garden tools rather than design requirements of a garden tool transporter. However, the majority of candidates answered this question well.

Many candidates gained full marks by producing four relevant specification points for a garden tool transporter and subsequently went onto expand their answer and provide a suitable explanation for each.

Candidates gained marks by using information given in the brief and elaborated upon it. Typically correct answers covered 'safety issues', 'durability', and 'suitability for outside use'.

Candidates failed to gain marks by repeating answers already given.

Question 2

The majority of candidates answered this question well. It was clearly evident that they had obviously worked with the preparation material and have subsequently gone on to produce quality responses.

- **Variety of Ideas**

  Many candidates were able to access high marks by showing two **different** ideas. Many candidates were able to demonstrate their creative ability by producing original designs. There were few copies of existing products. Even basic 'wheelbarrow' ideas had been manipulated and developed.

- **Quality of sketching**

  The standard of sketching was generally good. Many candidates made an attempt at producing a pictorial view of their idea. The majority of 2D line drawings were clear and in proportion. There was good use of colour/rendering techniques.

- **Quality of notes**

  The quality of annotation varied considerably. Most candidates chose to provide simple notes to describe the features of their ideas. Weaker candidates simply labelled the parts of their design, whilst higher marks were awarded to candidates who provided detailed notes regarding the function of their designs.

Question 3

(a) Most candidates were able to gain one of the two marks on offer by showing some measure of analytical thinking. Many went on to analyse a number of features of their design and gained full marks. Weaker candidates simply listed features of their design without making any value judgements, or made simple statements e.g. 'I like this one best'.

(b) Candidate's responses to this question were weak. Candidates did not display detailed knowledge of suitable method of constructing their design. Basic making skills were not demonstrated. Correct tool terminology was not used by the candidates.

Most candidates chose to provide details of how their design would be assembled, generally achieving half marks or less.

Weaker candidates simply repeated their best idea.

Question 4

(a) A few candidates misinterpreted this question. They related their answers to the style of the text, rather than the properties of given material. Common correct responses related to the self-adhesive vinyl being 'waterproof' and 'durable'. Many went on to explain their answers and thus gained full marks.

(b) This part of the question was particularly well answered. Almost all candidates knew of two ways in which the text had been manipulated. Common correct responses included 'the writing has been made bigger' and 'the font has been changed'.

(c) Most candidates knew of two generic advantages of the label being manufactured by a computer aided machine (CAM). Many went on to explain their answer and gained full marks. Common correct responses referred to 'accuracy', 'speed' and 'quality'.

Question 5

(a) A very well answered question. Most candidates were able to give two correct reasons why the tools should not be used with out handles. Many went onto explain their answer gaining full marks. Common correct responses referred to the person injuring themselves or the tools being difficult or uncomfortable to use.

(b) Almost all candidates produced a design for an ergonomically shaped handle and thus gained some marks, although, few designs contained sufficient ergonomic features to gain the candidate full marks.

(c) Most candidates gained some of the marks on offer by explaining one of their ergonomic features. Few successfully named and explained two reasons, in sufficient detail, to gain full marks. Correct responses referred to 'the grip' and 'control of the handle'.

Question 6

This question was generally well answered. Candidates were able to demonstrate a sound knowledge of materials and finishes.

(a) Garden furniture A

Most candidates correctly identified that garden furniture A was made from 'wood' and many chose a specific type of wood which gained them an extra mark. 'Pine' or 'Teak' was the most popular correct specific materials chosen.

Reference to its 'appearance' and 'strength' were generally given as correct reasons for choosing this material.

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Most candidates correctly identified that garden furniture B was made of 'plastic'. Many chose a specific type of plastic which gained them an extra mark. 'PVC' was the most popular correct specific material chosen.

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(a) There was a popular misconception that the drawing was an upside down seed tray rather than a former/mould. There was an obvious lack of knowledge of vacuum forming. Few marks were gained on this part of the question.

(b) Again candidates displayed a lack of knowledge of the use of a former/mould and were therefore unable to suggest a suitable material from which one would be made. Many candidates, again, were referring to the actual seed tray.

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(c) Almost all candidates knew of two symbols which you could find on flat pack furniture. 'safety', 'tools required', 'this way up' and 'fragile' being the most common correct responses.

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Question 8

This question was, generally, poorly answered. Knowledge of the vacuum forming process was weak or completely lacking.

(a) Few candidates correctly named a suitable, specific plastic from which to make the seed tray. The generic term plastic was often, incorrectly, given. Teachers and candidates are reminded that only specific materials will be awarded marks on this paper. 'PVC' was the most popular correct response.

(b) Few candidates correctly identified three important features of the mould/former. Common incorrect responses referred to the actual seed tray rather than the mould/former. These included. 'holes, to let the water out of the tray'

Coursework

General

A wide variety of interesting and demanding projects have been seen by moderators. The best have challenged candidates to design original and innovative products that have then been made to a high standard.

Assessment of projects continues to become more accurate. This is clear evidence of centres acting on the advice given in the Autumn teachers' meetings guidance notes.

Observed problems were mainly at new centres where the assessment procedure was unfamiliar or where centres had been faced with additional difficulties like changing staff, refurbishment or poor internal standardisation. A continuing but diminishing problem is that of providing incorrect matrix numbers for the coursework grades offered. Some centres need to be more vigilant in the awarding of QWC marks as this can have a significant affect on the overall total mark.

Assessment

Many centres were not visited if the folio grades were within AQA tolerance. In general the marking of the folios was more accurate than the three dimensional outcomes, though there was a perceived overall improvement in all areas. Where work had not been graded correctly it tended to be lenient rather than harsh, particularly at the higher grades. In some centres, the staff had been invited, but failed to attend the autumn training meetings, this affected the content and perceived level of demand for certain grades. In some centres, teachers had looked at the photo sheet used in the Autumn meetings and cross referenced their own projects against these, but had failed to take into account the comments about the quality of finish. This aspect does not show in the photographs, but for projects with C grades and above it is generally expected that the preparation for, and application of a finish should be of very high quality. Consideration of this matter will be given in the forthcoming Autumn teachers meetings. Generally moderated adjustments were usually small. However, some very simple but well made projects were still being over credited. Some projects required too much repetition of the same type of skill (e.g. repetitive joints) and this led to incomplete work from otherwise very able candidates.

Internal Standardisation

In most cases this was done well though, there were a few exceptions which led to remarking of work. This occurred where several staff did not confer or where the level of project demand was not understood and had adversely affected rank order. In a very few cases the level of demand for a given grade was clearly not agreed and work was inconsistently assessed.

1 Annotation

The A3 candidate record forms provided by the board, (copy in the specification) were used very effectively by many centres. Virtually all centres awarded a grade for each part of the designing and making in addition to an overall grade. This recording of assessments allowed moderation to continue effectively, and the process was often made easier where reference had been made to page numbers etc. Other useful annotation included, for example, comments on who did the welding, who set up the offsets on the CNC machine, who set up the router and jigs. When making assessments, it is useful to consider the project as a whole before deciding on a final grade, as each criteria heading does not necessarily carry equal weighting. For example, bulky research is not necessary to achieve a high grade. Higher grades were achieved where candidates had put more emphasis into the design, its development and the manufacturing quality. In the making section, high grades considered level of demand, skill content and finish quality. Where the annotation had been done well it explained why

as well as where work had been rewarded. Some centres simply highlighted criteria sections, which is not very helpful, as these comments are not focused on a particular project or experience.

2 Display of the sample

Coursework at the centre should be put out in order of merit of the practical outcomes, this makes assessment and moderation much faster, more accurate and easier. Not all centres did this. Candidate names and numbers on all pieces of work helped to speed up the process of moderation. Moderators did appreciate good quality photographs of outcomes in the folios. In many cases this helped moderators to select which centres require a visit.

Coursework Projects

More centres were restricting the size of outcomes, making them more manageable, easy to develop as time progressed and furthermore, easy to store. The best work from centres was varied in its range of tasks and was of marketable quality. The level of demand is still a key factor in the allocation of grade. Wooden toys were a popular item this year though a lot of work is still related to more traditional 'box' furniture. Some centres are using the same theme for all candidates which could lead to very similar projects. However, in some centres the same design brief for all candidates, led to a wide range of innovative and original projects. Many projects were of wood or plastics with very few 'engineered' or metal projects being seen. Physically smaller projects tended to have a better surface finish which helped their grade and allowed for rapid development . More use was seen of jigs for constructions and many centres were beginning to consider the commercial and industrial aspects of product design.

Challenging tasks which exhibit a variety of skills are required for the highest grades.

Use of CAD is growing with many candidates using ProDESKTOP and similar programs very effectively. Other CAD software was also used well by candidates in some centres. More candidates used CAM this year, but it is still used by only a small minority. Where CAM was used, CNC routers were very successful, and a number of candidates used vinyl cutters. Laster cutters are now becoming more common. Other candidates were effectively describing how CAM might be used for their design if produced on a commercial scale. Further reference will be made to CAD CAM in the Autumn training meetings.

3 Design folder

Most candidates now start with a clear (client) brief and are able to make a prompt start to gathering any information that will assist them with their designing. A few centres still allow candidates to explore all sorts of different project avenues, before choosing a specific design brief. This extra work only delays the start to work that can be credited.

Better candidates analysed the task rapidly, sometimes using a mind mapping technique. A research plan was, identified by this analysis. It, was concise, focused, relevant and used to influence the design. Less efficient candidates may have spent many hours assembling a huge volume of research material, which was then completely ignored when designing. Some still include copious notes on materials etc, and even lumps of wood! It is sufficient to justify material choice with a simple, reasoned statement (and this is possibly better done during the development section).

Specifications varied in detail, the best considered the needs of the client, designer, manufacturer and user. Most candidates who did well remembered that final product quality was judged against how well their product met this specification (fitness for purpose), which was therefore very focused and detailed.

Weaker specifications were often specifications for the coursework project, not the product itself.

Presentation techniques varied tremendously in the design and development sections, the best started with many rapid and usually small sketches on few sheets of paper being followed by detailed development to move an idea from a loose concept to an item capable of manufacture.

CAD has been used effectively by an increased number of candidates, and as confidence grows, some are starting to use CAD earlier in the development section. This allowed them to explore various detail solutions with accuracy and evaluate them on screen. Taking screen dumps and showing them on a single A3 sheet allowed development of ideas to be shown effectively.

ProDESKTOP is being used in an increasing number of centres. It allows the candidate to roduce high quality 3D imags. They the guests explore surface finishes and produce orthographic drawings.

Other CAD software is being employed in schools and its use is to be encouraged.

Many candidates found the best way to plan their making was through a flowchart with feedback loops to consider quality control.

More candidates have used, or considered the use of, jigs and templates in construction. Candidates have also considered how their product might be manufactured in quantity, or modified for manufacture in quantity. These aspects reflect good industrial practice.

When candidates finished their making in time to test the products with users and seek client reaction their evaluations were much stronger. Where this had been done, a photograph of the product in use was good evidence of the testing.

The best evaluations also tested the product against the original specification.

As a guide, a maximum of somewhere in the region of 20 x A3 sides should be adequate for even the very highest of grades on full course. The emphasis should be on content and not on quantity. This is especially important for short course candidates who have a reduced time for their project. It was accepted that project starting points for the short course were much simpler than for the full course for an equivalent grade.

Centres are requested to send folios using a secure binding system. Spiral binding worked very well. Slide on backs nearly always slid off in the post. Even simple tags proved to be better.

4 Use of Photographs

More candidates were beginning to make use of digital media to show the progression of ideas through modelling or construction. This recording can accompany planning showing how work has progressed and any subsequent modifications required. Final views of the product in ‘action’ were much appreciated by moderators.

5 Practical Outcomes

Most centres realise that a simple wooden box, no matter how well finished, is unlikely to achieve higher than a D or C grade. More able candidates undertook more demanding projects, often displaying imagination and originality, as well as achieving a high quality finish. The best outcomes were of a marketable quality. The quality of preparation for, and application of, a finish tended to be better on smaller projects in the limited time available.

Although storage featured as a theme for many outcomes, wooden toys were again popular. Clocks were a popular choice for short course outcomes. Other projects seen, included radios (with bought in components), jewellery (including pewter cast into foam moulds cut using CNC), low voltage lighting and a wide variety of other 3D objects. Slightly more projects were made from metal, but timber still dominates with plastics in second.

6 Industrial Practices

This aspect was covered well where candidates made reference to industrial practices throughout their design folders. Consideration to how a design might be modified for commercial production throughout the design ideas and development was displayed in the best folders. Jigs and templates were considered, designed and sometimes made. A few jigs were constructed to a higher standard than the product itself. Consideration was given to clients, users, manufacturers and marketing. Weaker folders tended to address industrial practices as 'bolt on' theory notes about unrelated vacuum forming or injection moulding.

7 Further Support

Autumn teacher guidance notes from 2003 gave useful information on what is expected in an RMT coursework project. Further exemplar material will be demonstrated this autumn to illustrate examples of good practice from this year. In particular, concise research, good design, good use of CAD/CAM, and examples of the sort of quality of finish that is needed to allow the award of the highest making grades.

Once again the Principal Moderator and AQA are very grateful for the projects which have been loaned for possible use at training meetings and for moderator training. We are also extremely grateful to those teachers who gave their time and expertise to act as moderators and the headteachers who released them to make the process possible.

Mark Ranges and Award of Grades

Although component grade boundaries are provided, these are advisory. Candidates' final grades depend on their total marks for the subject. In particular, A* is determined on candidates' total marks, not on each component, and candidates do not have to obtain 95 marks on the coursework component in order to gain grade A* on the subject as a whole.

Full Course

Foundation tier

Component	Maximum Mark (Raw)	Maximum Mark (Scaled)	Mean Mark (Scaled)	Standard Deviation (Scaled)
3545/F	125	140	81.88	21.56
3545/C	95	210	109.95	37.30
Foundation tier overall 3545	--	350	191.83	48.65

		Max. mark	C	D	E	F	G
3545/F boundary mark	raw	125	91	76	62	48	34
	scaled	140	102	85	69	54	38
3545/C boundary mark	raw	95	60	48	36	24	12
	scaled	210	133	106	80	53	27
Foundation tier scaled boundary mark		350	227	187	147	107	67

Higher tier

Component	Maximum Mark (Raw)	Maximum Mark (Scaled)	Mean Mark (Scaled)	Standard Deviation (Scaled)
3545/H	125	140	79.23	16.51
3545/C	95	210	162.8	31.07
Higher tier overall 3545	--	350	242.03	40.60

		Max. mark	A*	A	B	C	D	allowed E
3545/H boundary mark	raw	125	94	87	80	73	58	-
	scaled	140	105	97	90	82	65	-
3545/C boundary mark	raw	95	95	83	71	60	48	-
	scaled	210	210	183	157	133	106	-
Higher tier scaled boundary mark		350	304	274	244	214	171	149

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Provisional statistics for the award

Foundation tier (37,448 candidates)

	C	D	E	F	G
Cumulative %	24.9	55.8	77.8	90.3	96.5

Higher tier (28,431 candidates)

	A*	A	B	C	D	allowed E
Cumulative %	4.9	22.9	50.4	76.9	94.9	97.7

Overall (66,027 candidates)

	A*	A	B	C	D	E	F	G
Cumulative %	2.1	9.9	21.7	47.3	72.6	86.4	93.5	97.1

Short Course

Foundation tier

Component	Maximum Mark (Raw)	Maximum Mark (Scaled)	Mean Mark (Scaled)	Standard Deviation (Scaled)
3555/F	100	120	70.32	18.50
3555/C	95	180	89.34	32.92
Foundation tier overall 3555	--	300	159.66	41.09

		Max. mark	C	D	E	F	G
3555/F boundary mark	raw	100	77	67	57	48	39
	scaled	120	92	80	68	58	47
3555/C boundary mark	Raw	95	60	48	36	24	12
	scaled	180	114	91	68	45	23
Foundation tier scaled boundary mark		300	197	165	134	103	72

Higher tier

Component	Maximum Mark (Raw)	Maximum Mark (Scaled)	Mean Mark (Scaled)	Standard Deviation (Scaled)
3555/H	100	120	73.05	13.09
3555/C	95	180	139.96	28.57
Higher tier overall 3555	--	300	213.01	35.67

		Max. mark	A*	A	B	C	D	allowed E
3555/H boundary mark	raw	100	80	76	72	68	50	-
	scaled	120	96	91	86	82	60	-
3555/C boundary mark	raw	95	95	84	72	60	48	-
	scaled	180	180	159	136	114	91	-
Higher tier scaled boundary mark		300	261	244	219	195	151	129

Although component grade boundaries are provided, these are advisory. Candidates' final grades depend on their total marks for the subject. In particular, A* is determined on candidates' total marks, not on each component, and candidates do not have to obtain 95 marks on the coursework component in order to gain grade A* on the subject as a whole.

Provisional statistics for the award

Foundation tier (1,132 candidates)

	C	D	E	F	G
Cumulative %	19.4	46.2	70.1	86.6	95.6

Higher tier (1,082 candidates)

	A*	A	B	C	D	allowed E
Cumulative %	5.7	22.2	48.2	72.6	94.7	97.3

Overall (2,214 candidates)

	A*	A	B	C	D	E	F	G
Cumulative %	2.8	10.8	23.5	45.5	69.9	83.4	91.8	96.4

Definitions

Boundary Mark: the minimum (scaled) mark required by a candidate to qualify for a given grade. Although component grade boundaries are provided, these are advisory. Candidates' final grades depend only on their total marks for the subject.

Mean Mark: is the sum of all candidates' marks divided by the number of candidates. In order to compare mean marks for different components, the mean mark (scaled) should be expressed as a percentage of the maximum mark (scaled).

Standard Deviation: a measure of the spread of candidates' marks. In most components, approximately two-thirds of all candidates lie in a range of plus or minus one standard deviation from the mean, and approximately 95% of all candidates lie in a range of plus or minus two standard deviations from the mean. In order to compare the standard deviations for different components, the standard deviation (scaled) should be expressed as a percentage of the maximum mark (scaled).