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ASSESSMENT and QUALIFICATIONS ALLIANCE

Report on the Examination

Design and Technology: Resistant Materials Technology
3545/3555

- Full Course
- Short Course

Version 1.1

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Kathleen Tattersall, Director General

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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 see that the new specification examination papers have been well received by centres. The papers were found to be well balanced, testing the creative design ability, the subject knowledge and the intellectual ability of the candidates.

The use of the preparation material is intended to give the candidates a real '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 a full involvement in 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 produced 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 evidence of candidates misinterpreting the question. 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 advise candidates to use any 'spare' time at the end of the examination to carefully go through both the questions and their answers.

It is worrying to see that the least well answered questions were the ones which required candidates to show their knowledge of making processes. 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

Question 1

This question was well answered. Most candidates were able to give three checks which they would carry out before buying a computer workstation. Many went onto provide an explanation as to why this check would need to be carried out. Correct responses included *'check that all the equipment will fit onto the computer workstation'*, '*Check that it will fit into you home'* and *'check that it is safe to use'*.

Question 2

This question was generally well answered. Many candidates named two uses of ICT which would help them to design a computer workstation. A few went onto successfully name a third but most simply repeated an earlier answer. Explanations varied, many candidates gained some marks but few went onto provide three different reasons.

The use of a *software design package, the Internet* and *word processing* being the most common correct responses.

Answers which related to ICT in the manufacture of the computer workstation were not awarded marks unless they specifically related to *'modelling'* or the production of a *'prototype'*.

Question 3

There was evidence of candidates misinterpreting the question and/or candidates being ill prepared for the exam. A few candidates, usually grouped within a particular centre, produced a specification list for a personal computer, rather than a computer workstation. However, the majority of candidates answered this question well. Many candidates gained full marks by producing four relevant specification points for a computer work station and subsequently went onto expand their answer and provide a suitable explanation.

Candidates gained marks by using information given in the brief and elaborated upon it. Typically correct answers covered *'safety issues', 'ergonomics', 'quality of manufacture'* and *'accessibility'*. Candidates lost marks by repeating answers already given.

Question 4

Where candidates had failed to correctly interpret Question 3, they usually went onto compound their mistake by misinterpreting this question also. Once again I cannot stress enough the need for teachers to make full use of the preparation material so that their candidates are not disadvantaged in this way.

However, I am pleased to report that the majority of candidates answered this question well. It was clearly evident that the majority of candidates had obviously worked with the preparation material and have subsequently gone on to produce high quality responses.

- **Variety of Ideas**

  Many candidates were able to access high marks by showing three *different* ideas. Most were adaptations of existing products, but a number of candidates were able to demonstrate their creative ability by producing original designs.

- **Quality of sketching**

  The standard of sketching was 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.

- **Quality of notes**

  The quality of annotation varied considerably. Most candidates chose to provide simple notes describing the features of their ideas. Less able 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 5

(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.

This question highlights an issue for our subject. Candidate's responses to this question were generally weak. It is advisable for centres to teach basic making skills and ensure that correct tool terminology is understood by the candidates.

(b) Most candidates knew of a suitable method of joining the main frame of their chosen idea together. Many chose to use *'dowels'*, *'kd fittings'* or *'screws'*. However, details of the method of construction were generally vague.

Question 6

(a) This safety question was particularly well answered. Candidates displayed excellent knowledge of the safety requirements when using a Jig saw to cut manufactured boards. Reference to the use of *'goggles*', *'a dust mask', 'ensuring that the work piece was secure'* and *'keeping hands away from the blade'* were frequent correct responses.

(b) This question was well answered. Most candidates were able to identify the two safety symbols from the sheet of colour photographs. Many went onto provide details of the precautions which should be taken when you see these symbols.

Question 7

(a) The candidate's knowledge of environmental issues was found to be quite limited. Correct responses lacked any real detail and most answers were generally confused and rather vague.

The most popular correct reasons for a material being considered environmentally friendly included it being *'a renewable resource'* and being *'recyclable'*.

A number of candidates confused environmentally friendly with non-environmentally friendly.

(b) Again, there was a poor responses to this part of the question. There was a general lack of understanding and candidates struggled to convey their knowledge.

The most popular correct reasons for a material being considered non - environmentally friendly included *'it does not rot'* and *'it gives off harmful gases when you burn it'*.

Question 8

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

(a) Part A – the framework

Most candidates correctly identified that the frame was made from *'wood'* and many chose a specific type of wood which gained them an extra mark. *'Pine'* was the most popular correct specific material chosen.

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

Part B – the shelf

Most candidates correctly identified that the shelf was made of *'glass'* or *'acrylic'*.

Reference to it being *'clear'* and *'attractive'* were generally given as correct reasons for choosing this material.

Part C – the leg

Most candidates correctly identified that the leg was made from *'metal'* and many chose a specific metal which gained them an extra mark. *'Steel'* was the most popular specific material chosen.

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

(b) Part A – the framework

Most candidates gave a suitable specific finish which could be applied to the frame. *'Varnish'* was the most popular correct specific finish chosen.

Part B – the shelf

Many candidates correctly chose *'polish'* as a correct method of finishing glass. However a number of candidates left this part of the question blank.

Part C – the leg

Most candidates gave a suitable specific finish which could be applied to the leg. *'Spray paint'* was the most popular correct specific finish chosen.

(c) Most candidates knew of one reason why it is important to apply a finish to the leg and many went onto gain full marks by giving a second reason. *'to stop it rusting'* and *'to make it look good'* were the most popular correct responses.

Question 9

(a) This part of the question was well answered. Most candidates correctly circled the four parts which a manufacturer would have most likely have bought from another supplier.

(b) Candidates struggled to formulate their answers as to why a manufacturer would buy these components from another supplier. There were many vague and confused responses. At this level there is only a superficial knowledge of this concept.

(c) Many candidates gained some marks on this question and a few went onto achieve full marks. It is encouraging to see that the advantages of using CAM are being addressed. Candidates gained marks by stating and elaborating on the fact that CAM *'speeds up production', 'produces a high quality product', 'improves consistency'* and *'reduces cost'*. Weaker candidates misread the question and provided answers which were relevant to CAD.

Question 10

Once again, this question highlights an issue for our subject. Candidate's responses to this question were generally weak. It is advisable for centres to teach basic making skills and ensure that correct tool terminology is understood by the candidates.

Many candidates elected to use generic terms for the chosen tools e.g. *'saw'* and *'drill'*. These were not awarded marks. Specific names e.g. *'hacksaw'* and *'pillar drill'* were required to gain a mark.

Question 11

(a) There were many ingenious methods of attaching the table top to the frame given by candidates. *'Screwing through the frame'* was the most popular correct response. Incorrect or inappropriate responses included *'sticking it with no more nails'*, *'welding it'* and by *'magic'*!

(b) Answers to this part of the question were, in most cases, weak and rather vague.

Marking out – there was some understanding but little detail. Most candidates managed to name a suitable marking out tool.

Preparation – there was very little understanding of this part of the process.

Fixing - there was some understanding but little detail. Most candidates managed to correctly name a screwdriver as a suitable tool.

Full Course

Higher

Question 1

This question was well answered. Many candidates successfully named three uses of ICT which would help them to design a computer workstation. Most went onto expand their answer and provide a suitable explanation.

The use of *'a software design package'*, *'the Internet'* and *'word processing'* being the most common correct responses.

Answers which related to ICT in the manufacture of the computer workstation were not awarded marks unless they specifically related to *'modelling'* or the production of a *'prototype'*.

Question 2

This question was well answered. Many candidates gained full marks by producing five relevant specification points for a computer work station and subsequently went onto expand their answer and provide a suitable explanation.

Candidates gained marks by using information given in the brief and elaborating upon it. In addition typically correct answers covered *'safety issues'*, *'ergonomics'*, *'quality of manufacture'* and *'accessibility'*.

Candidates lost marks by repeating answers already given.

Question 3

A very encouraging, well answered question. It was clearly evident that the majority of candidates had obviously worked with the preparation material, and have subsequently gone on to produce high quality responses.

- **Variety of Ideas**

  Many candidates were able to access high marks by showing three **different** ideas. Most were adaptations of existing products, but a 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**

  The quality of annotation varied considerably. Most candidates chose to provide simple notes describing the features of their ideas. High marks were awarded to candidates who provided detailed notes regarding the function of their designs.

- **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.

Question 4

This question highlights an issue for our subject. Candidate's responses to this question were, generally, weak. It is advisable that centres teach basic making skills and ensure that the correct tool terminology is understood by the candidates.

(a) Many candidates chose a correct and suitable method of joining the main frame of their chosen idea together. The use of dowels and *'kd'* fittings being the most popular responses.

(b) In general, details were vague and few candidates gained full marks. Many candidates chose not to provide details of marking out and preparation. Construction details were usually incomplete and there were many occasions were inappropriate tools were being named.

(c) Most candidates displayed knowledge of the use of CAM to increase the quality and accuracy of manufacture. Many went on to cover jigs, templates, quality control and quality assurance in their answer.

Question 5

There was a full range of methods chosen by the candidates to raise the height of the workstation by 100mm. Weaker responses included *'making the legs longer'* or *'adding blocks under the feet'*. Many candidates chose to raise the height by *'sliding the keyboard shelf onto higher runners'* or by the use of *'spring and clip adjustable legs'*. The use of mechanisms included *'screw threads'* and *'rack and pinion gearing'*.

Again the quality of notes and sketches was generally good.

Question 6

(a) This safety question was particularly well answered. Candidates displayed excellent knowledge of the safety requirements when using a Jig saw to cut manufactured boards. Reference to the use of *'goggles'*, *'a dust mask'*, *'ensuring that the work piece was secure'* and *'keeping hands away from the blade'* were frequent correct responses.

(b) Many candidates gained full marks by referring to four correct working conditions. Ensuring that there was *'sufficient ventilation'*, *'good lighting'*, *'a clear floor area'* and *'the correct*

safety equipment was available', were among many correct responses. Some candidates lost marks by failing to relate their answer to *'the working environment'*.

Question 7

(a) Many candidates were able to name a suitable specific environmentally friendly material. A number lost marks by offering a generic term for a material.

Candidates were still rewarded for reasons which were correct even if the chosen material was wrong or vague.

The candidate's knowledge of environmental issues was most encouraging, providing evidence that this part of the specification is being addressed by centres and/or that there are good cross curricular links.

The most popular correct reasons for a material being considered environmentally friendly included it being *'a renewable resource'* and being *'recyclable'*.

(b) Many candidates were able to name a suitable specific non - environmentally friendly material, but once again a number lost marks by offering a generic term for a material.

The most popular correct reasons for a material being considered non - environmentally friendly included it being *'made from a non - renewable resource'*, being *'non – biodegradable'*, leading to *'global warming'* and *'producing toxic gases when it is being made'*.

Question 8

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

(a) Part A – the framework

Most candidates correctly named a specific type of wood from which the frame was likely to have been made from. The most popular answer being *'Pine'*.

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

Part B – the shelf

Most candidates correctly named *'glass'* or *'acrylic'* as being a suitable specific material from which the shelf was likely to have been made from. Reference to it being *'clear'* and *'attractive'* were generally give as correct reasons for their choice.

Part C – the metal leg

Most candidates correctly named *'steel'* as being a suitable specific material from which the shelf was likely to have been made from.

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

Part D – the backboard

Most candidates failed to correctly name a suitable specific material from which the back of the cabinet was likely to have been made. A manufactured board, of any type, was not given a mark unless it has a suitable specific veneer, covering or finish, applied.

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

(b) (i) Most candidates gave a suitable specific finish which could be applied to the metal leg. *'spray paint'* and *'polishing'* (aluminium) were the most popular correct responses.

(ii) Once again this question highlights an issue for our subject. Candidate's responses to this question were generally weak. It is advisable that centres teach finishing skills and ensure correct tool terminology is understood by the candidates.

A few candidates gained full marks on this section by providing detailed information on how to prepare and finish the metal leg. However, many candidates' responses were very vague.

(c) Most candidates displayed knowledge of the use of CAM and some went on to link it specifically to the finishing of the metal leg. Popular methods included use of *'a conveyor belt'*, *'spray gun'*, and *'a spray booth'*.

Question 9

This question was well answered by candidates. It is encouraging to see that the advantages of using CAM are well understood. Many candidates gained high marks by stating and elaborating on the fact that CAM *'speeds up production'*, *'produces a high quality product'*, *'improves consistency'* and *'reduces cost'*.

Short Course

Foundation

Question 1

There was evidence of a few candidates misreading the question by giving checks which you would carry out before buying a computer rather than a computer workstation. However, most candidates were able to give three checks which they would carry out before buying a computer workstation. Many went onto provide an explanation as to why this check would need to be carried out. Correct responses included *'check that all the equipment will fit onto the computer workstation', 'Check that it will fit into you home'* and *'check that it is safe to use'*.

Question 2

This question was generally well answered. Many candidates named two uses of ICT which would help them to design a computer workstation. Explanations varied, many candidates gained some marks but few went onto provide two different reasons.

The use a *'software design package'*, *'the Internet'* and *'word processing'* being the most common correct responses.

Answers which related to ICT in the manufacture of the computer workstation were not awarded marks unless they specifically related to *'modelling'* or the production of a *'prototype'*.

Question 3

There was evidence of candidates misinterpreting the question and/or candidates being ill prepared for the exam. A few candidates, usually grouped within a particular centre, produced a specification list for a personal computer, rather than a computer workstation. However, the majority of candidates answered this question well. Many candidates gained full marks by producing three relevant specification points for a computer work station and subsequently went onto expand their answer and provide a suitable explanation.

Candidates gained marks by using information given in the brief and elaborated upon it. Typically correct answers covered *'safety issues', 'ergonomics', 'quality of manufacture'* and *'accessibility'*. Candidates lost marks by repeating answers already given.

Question 4

Where candidates had failed to correctly interpret Question 3, they usually went onto compound their mistake by misinterpreting this question also. Once again I cannot stress enough the need for teachers to make full use of the preparation material so that their candidates are not disadvantaged in this way. However, I am pleased to report that the majority of candidates answered this question well. It was clearly evident that the majority of candidates had obviously worked with the preparation material and have subsequently gone on to produce high quality responses.

- **Variety of Ideas**

  Many candidates were able to access high marks by showing two **different** ideas. Most were adaptations of existing products, but a number of candidates were able to demonstrate their creative ability by producing original designs.

- **Quality of sketching**

  The standard of sketching was 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.

- **Quality of notes**

  The quality of annotation varied considerably. Most candidates chose to provide simple notes describing 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 5

(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.

This question highlights an issue for our subject. Candidate's responses to this question were generally weak. It is advisable that centres teach basic making skills and ensure correct tool terminology is understood by candidates.

(b) Most candidates knew of a suitable method of joining the main frame of their chosen idea together. Many chose to use *'dowels'*, *'kd fittings'* or *'screws'*. However, details of the method of construction were generally vague.

Question 6

(a) This safety question was particularly well answered. Candidates displayed excellent knowledge of the safety requirements when using a Jigsaw to cut manufactured boards. Reference to the use of *'goggles'*, *'a dust mask'*, *'ensuring that the work piece was secure'* and *'keeping hands away from the blade'* were frequent correct responses.

(b) This question was well answered. Most candidates were able to identify the safety symbol from the sheet of colour photographs. Many went onto provide details of the precautions which should be taken when you see this symbol.

Question 7

(a) The candidate's knowledge of environmental issues was found to be quite limited. Correct responses lacked any real detail and most answers were generally confused and rather vague.

The most popular correct reasons for a material being considered environmentally friendly included it being *'a renewable resource'* and being *'recyclable'*.
A number of candidates confused environmentally friendly with non-environmentally friendly.

(b) Again, there was a poor responses to this part of the question. There was a general lack of understanding and candidates struggled to convey their knowledge.

The most popular correct reasons for a material being considered non - environmentally friendly included *'it does not rot'* and *'it gives off harmful gases when you burn it'*.

Question 8

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

(a) Part A – the framework

Most candidates correctly identified that the frame was made from *'wood'* and many chose a specific type of wood which gained them an extra mark. *'Pine'* was the most popular correct specific material chosen.

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

Part B – the shelf

Most candidates correctly identified that the shelf was made of *'glass'* or *'acrylic'*.

Reference to it being *'clear'* and *'attractive'* were generally given as correct reasons for choosing this material.

(b) Part A – the framework

Most candidates gave a suitable specific finish which could be applied to the frame. *'Varnish'* was the most popular correct specific finish chosen.

Part B – the shelf

Many candidates correctly chose *'polish'* as a correct method of finishing glass. However a number of candidates left this part of the question blank.

(c) Most candidates knew of one reason why it is important to apply a finish to the framework and many went onto gain full marks by giving a second reason. *'For protection'* and *'to make it look good'* were the most popular correct responses.

Question 9

(a) This part of the question was well answered. Most candidates correctly circled the four parts which a manufacturer would have most likely have bought from another supplier.

(b) Candidates struggled to formulate their answers as to why a manufacturer would buy these components from another supplier. There were many vague and confused responses. At this level there is only a superficial knowledge of this concept.

Question 10

(a) Once again, this question highlights an issue for our subject. Candidate's responses to this question were generally weak. It is advisable that centres teach basic making skills and ensure that correct tool terminology is understood by the candidates.

Many candidates elected to use generic terms for the chosen tools e.g. *'saw'* and *'drill'*. These were not awarded marks. Specific names e.g. *'hacksaw'* and *'pillar drill'* were required to gain a mark.

(b) Many candidates gained some marks on this question and a few went onto achieve full marks. It is encouraging to see that the advantages of using CAM are being addressed. Candidates gained marks by stating and elaborating on the fact that CAM *'speeds up production'*, *'produces a high quality product'*, *'improves consistency'* and *'reduces cost'*. Less able candidates misread the question and provided answers which were relevant to CAD.

Question 11

Answers to this part of the question were, in most cases, weak and rather vague.

Marking out – there was some understanding but little detail. Most candidates managed to name a suitable marking out tool.

Preparation – there was very little understanding of this part of the process.

Fixing - there was some understanding but little detail. Most candidates managed to correctly name a screwdriver as a suitable tool.

Short Course

Higher

Question 1

This question was well answered. Many candidates successfully named two uses of ICT which would help them to design a computer workstation. Most went onto expand their answer and provide a suitable explanation.

The use of a *'software design package'* and *'the Internet'* being the most common correct responses.

Answers which related to ICT in the manufacture of the computer workstation were not awarded marks unless they specifically related to *'modelling'* or the production of a *'prototype'*.

Question 2

This question was well answered. Many candidates gained full marks by producing three relevant specification points for a computer workstation and subsequently went onto expand their answer and provide a suitable explanation.

Candidates gained marks by using information given in the brief and elaborating upon it. In addition typically correct answers covered *'safety issues, ergonomics, quality of manufacture and accessibility'*.

Candidates lost marks by repeating answers already given.

Question 3

A very encouraging, well answered question. It was clearly evident that the majority of candidates had obviously worked with the preparation material and have subsequently gone on to produce high quality responses.

- **Variety of Ideas**

  Many candidates were able to access high marks by showing two *different* ideas. Most were adaptations of existing products, but a number of candidates were able to demonstrate their creative ability by producing original designs. Few candidates chose to use a mechanism to raise the height of the workstation.

- **Quality of sketching**

  The standard of sketching was very good. Most candidates were able to produce a pictorial view of their idea; however there was little use of colour.

- **Quality of notes**

  The quality of annotation varied considerably. Most candidates chose to provide simple notes describing the features of their ideas. High marks were awarded to candidates who provided detailed notes regarding the function of their designs.

- **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.

Question 4

This question highlights an issue for our subject. Candidate's responses to this question were generally weak. It is advisable that centres teach basic making skills and ensure that correct tool terminology is understood by the candidates.

(a) Many candidates chose a correct and suitable method of joining the main frame of their chosen idea together. The use of *'dowels'* being the most popular response.

(b) In general, details were vague and few candidates gained full marks. Many candidates chose not to provide details of marking out and preparation. Construction details were usually incomplete and there were many occasions were inappropriate tools were being named.

(c) Most candidates displayed knowledge of the use of CAM to increase the quality and accuracy of manufacture. Only a few went onto cover jigs, templates, quality control and quality assurance in their answer.

Question 5

Few candidates were able to access the higher mark range as they had failed to use a mechanisms as part of their design to raise the height of the workstation by 100mm. Weaker responses included *'making the legs longer'* or *'adding blocks under the feet'*. Many candidates chose to raise the height by *'sliding the keyboard shelf onto higher runners'* or by the use of *'spring and clip adjustable legs'*.

Again the quality of notes and sketches were generally good.

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This safety question was particularly well answered. Candidates displayed excellent knowledge of the safety requirements when using a Jig saw to cut manufactured boards. Reference to the use of *'goggles, a dust mask, ensuring that the work piece was secure and keeping hands away from the blade'* was frequent given as correct responses.

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Candidates were still rewarded for reasons which were correct even if the chosen material was wrong or vague.

The candidate's knowledge of environmental issues was most encouraging, providing evidence that this part of the specification is being addressed by centres and/or that there are good cross-curricular links.

The most popular correct reasons for a material being considered environmentally friendly included it being *'a renewable resource'* and being *'recyclable'*.

(b) Many candidates were able to name a suitable specific non - environmentally friendly material, but once again a number of candidates lost marks by offering a generic term for a material.

The most popular correct reasons for a material being considered non - environmentally friendly included it being *'made from a non - renewable resource'*, being *'non – biodegradable'*, leading to *'global warming'* and *'producing toxic gases when it is being made'*.

Question 8

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

(a) Part A – the frame

Most candidates correctly named a specific type of wood from which the frame was likely to have been made from. The most popular answer being *'Pine'*.

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

Part B – the shelf

Most candidates correctly named *'glass'* or *'acrylic'* as being a suitable specific material from which the shelf was likely to have been made from. Reference to it being *'clear'* and *'attractive'* were generally given as correct reasons for their choice.

Part C – the back of cabinet

Most candidates failed to correctly name a suitable specific material from which the back of the cabinet was likely to have been made from. A manufactured board, of any type, was not given a mark unless it had a suitable specific veneer, covering or finish, applied.

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

(b) (i) Most candidates gave a suitable specific finish which could be applied to the framework. *'varnish'* was the most popular correct responses.

(ii) Once again this question highlights an issue for our subject. Candidate's responses to this question were generally weak. It is advisable that centres teach basic making skills and ensure that correct tool terminology is understood by the candidates.

A few candidates gained full marks on this section by providing detailed information on how to prepare and finish the framework. However, many candidates' responses were very vague.

(c) Most candidates displayed some knowledge of the use of CAM to apply a finish to the frame. However, few candidates went onto give specific details of how this would be achieved.

Question 9

This question was well answered by candidates. It is encouraging to see that the advantages of using CAM are well understood. Many candidates gained high marks by stating and elaborating on the fact that CAM *'speeds up production'*, *'produces a high quality product'*, *'improves consistency'* and *'reduces cost'*.

Coursework

General

There was a great deal of refreshing new work this year and most centres had responded well to the slightly different demands of this new specification. Much more use of CAD had been seen along with some use of CAM as more equipment has become available. There was also an increase in the use of jigs and templates to aid production. Many projects were smaller which allowed for rapid redevelopment, particularly where early modelling showed inadequacies in the designs. Not many projects were of a commercial nature but these are beginning to appear. Industrial practice is still a weak area and misunderstood by many candidates. Where it had been tackled well it was related directly to the designed product and was not necessarily all about manufacturing processes and batch production. Quality assurance and control was an issue for many candidates and testing related to this is still a weak area. Outcome quality and surface finish in particular affected some of the higher grades. In some cases folders were still on the bulky side with some of the early content being irrelevant to the brief. Considering the very tight time limits this is a point for future consideration. It appears that centres are finding the 40 and 20 hour time limits difficult to work to and many projects are probably still outside these limits, especially on the Short Course.

A point to note is that project outcomes should be predominantly of wood, metal or plastics. Although other materials can legitimately be used, and in fact are encouraged, they should be regarded as supplementary for this specification. This was to allow credit to be given for seats with fabric coverings/cushions, lamps with shades and garden umbrellas which were covered etc. It was not intended that textile products like dresses would be the sole type of outcome, though some were seen.

Observed administrative problems were again mainly at new centres where the holistic grading procedure was unfamiliar or where centres had been faced with additional difficulties like changing staff, refurbishment or poor internal standardisation. A number of centres are still sending incorrect matrix marks for the coursework grades offered. Some centres need to be more vigilant in the awarding of QWC marks. For the first time, the component marks/grades were not recorded on the Centre Mark Sheet (CMS), so some matrix errors may have gone unnoticed. Moderators can now only check the samples they receive. Many centres were late sending in their coursework mark sheets to moderators and then further delays were experienced when folios were requested. This did cause considerable difficulties trying to meet deadlines for moderators. It is expected that next year everyone will be more familiar with the system.

Assessment

Some centres were not visited where the folio grades were within board tolerance. Moderators reported a great increase in the use of photographic evidence and felt this had made the job of accurately marking folders much easier. In general the marking of the folders was more accurate than the outcomes. However there is still too much emphasis on collections, materials and surveys which do not guide the design work and not enough emphasis on the designs themselves, their development and their testing with potential users. In some centres teachers were not aware of the 'Notes and Guidance' packs for Resistant Materials Technology and this affected content and perceived level of demand for certain grades. Some projects required too much repetition of the same type of hand skill (eg repetitive joints) which led to incomplete work from otherwise very able candidates. Poor surface preparation and the quality of finish was an issue which affected some moderated grades above the 'C' boundary. This is something which is not easily appreciated on a photograph when relating outcomes to the AQA exemplar material from the Autumn Teachers' Meetings.

Internal Standardisation

A very small number of re-marks were necessary, mainly where centres had not internally standardised and got the order of merit wrong, or where other administrative difficulties had occurred. This included changes of staff, misunderstanding of the specifications, incorrect matrix calculations and simple errors of judgement.

Annotation

It is a specific requirement of the course to complete the *Candidate Record Form* with Design/Make grades, QWC and the calculated totals. A grade for each section was a useful minimum guide. Although wordy annotation is not required except as outlined in this year's coursework notes and guidance, where it was done, focused annotation helped moderators agree with centre grades. Usefulness was dependent on the detail and relevance to the factors that could not be easily observed or might otherwise have been missed. Projects should be considered as a whole before deciding on a final grade. Bulky research is not necessary to achieve a high grade. Higher grades were achieved where candidates had chosen a demanding task and put more emphasis into the design, its development and the manufactured quality of the outcome. In the making section high grades considered level of demand, an appropriate outcome, range of skills and finish quality. Where the annotation had been found useful it explained *why* the work had been rewarded.

Display of the sample

Coursework at the centre should be laid out in order of merit for the moderator's visit as it 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.

Coursework Projects

More centres were producing smaller outcomes, making them more manageable, easier 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, clocks and small storage units were popular items this year though a lot of work is still related to more traditional 'box' furniture. Some centres used the same theme for all candidates and yet still managed to generate a very wide range of designs and outcomes in a variety of materials. Most projects were of wood or plastics with few 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 a growing number of centres were beginning to consider commercial aspects. This was evident in the way candidates had referred to, and tested designs with, potential consumers.

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

Use of CAD (Pro-Desktop, Corel Draw, AutoCAD, Techsoft 2D etc) and CAM has increased rapidly within this subject over the last year. More equipment is beginning to appear and candidates are producing interesting work. CNC routers seem to have high potential for Resistant Materials products. The use of laser cutters is also increasing. Some candidates usefully described how CAM might be used to aid the manufacture of their product, even though the facility was not available in their centre.

Design Folders

The purpose of the folder is to convey a design proposal to a client, manufacturer or customer and suggest how ideas for an outcome have been considered and developed to the point where someone else could make them. It should conclude by describing how the product was tested/reviewed in operation noting the views of others and offering a possible future way forward.

hose folios that reflected this approach scored well.

Many folios contained far too many pages, many of which were irrelevant. As a guide a **maximum** of 20 x A3 sides should be adequate for even the very highest of grades (see 2002 teacher 'Notes and Guidance' for more details on page quantity and content). Final grade depends on content and not on quantity. This is especially important for short course candidates who have very little time for their project.

Research

The research that gained most credit was that which was referred to and used to guide the project in the design section and had an obvious effect on project direction. Some of the better research was done in the design or development section when a difficulty had occurred. Candidates are asked not to include real samples of wood, plastics or metal in the folio and to reduce or even remove the wealth of general information about these materials.

Specification

Specifications varied in detail, the best considered the needs of the client, designer, manufacturer and user as it would in industry. Too many specifications were far too general and could have been written without any research. Few candidates produced a manufacturing specification after designs had been developed. Most candidates who did well remembered that final product quality was judged against how well their product met their specifications, which were therefore focussed and detailed.

Design and Development

For many Design and Development are still the weakest areas, yet they are the core of the activity. 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 followed by detailed development to move an idea from a loose concept to a manufacturable item. Again the better candidates made use of CAD in the final stages of their designs and offered excellent quality views of parts with sizes. Some candidates made use of CAM to produce parts, templates or cut-outs (vinyl etc) and other surface decoration.

Working schedules gained credit in the planning section, especially where alternative pathways for progress were offered if things went wrong. Step by step production plans with Quality Control points also helped to explain the project and indicate where jigs, templates and checks might be used.

Testing and evaluation in the best folios referred to the specification from various points of view. i.e. that of the client/designer/manufacturer/consumer/user. What was looked for was a clear understanding of the effectiveness of the outcome when related to the need. Not enough outcomes were adequately or objectively tested, especially with real customers where this is possible within the time limit.

Project starting points were understandably simpler for Short Course candidates than for the Full Course. Note should therefore be taken of the need for smaller design folders which was not always the case.

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.

Use of Photographs

Centres are to be congratulated on the increased use of photographic evidence of outcomes and stages in the folders. More candidates are beginning to make use of digital media to show the progression of ideas through modelling or construction. Where photographs were used to show final outcomes or developmental stages this had usually helped to enhance the folio grade as the intentions were clarified and more easily understood by the reader. Final views of the product in 'action' were much appreciated by moderators.

Practical Outcomes

Smaller products of a commercial nature accessed the highest grades for the short course. The most popular were wooden games/toys for a wide age range, clocks for particular environments and candle/lighting systems. Even on full courses some projects lacked challenge and demand with students failing to display the skills and understanding appropriate to the grade. This was particularly evident at the C/D grade boundary and above. More candidates were able to indicate how their work might be made industrially or by a third party. Where industrial manufacturing practice was mentioned, however, it still tended to be isolated from the work itself, though improvements have been noted. Some of the better candidates were suggesting how their working prototype might be rethought to produce it in batch form. In some cases this included considering a change of material or manufacturing system because the suggested industrial process could not be used in the centre. Not enough effort was put into testing finished products. The surface quality and applied finish on many products was not good enough for the highest grades.

Industrial Practices

This was discussed again at the round of teacher meetings this year and advice is contained in the current 2002 AQA Notes and Guidance Update. Industrial practice is not solely about manufacturing and is still not being covered very well by the majority of candidates, perhaps because they are unaware of the issues and how to apply knowledge of industrial practice to their individual projects. Industrial practices need to be referred to in an explicit way by candidates in their folios such that knowledge of the application is obvious and therefore easier to assess. It is relevant to explore all aspects of industrial practices from marketing, design briefs and concepts, to final planning, costing and production, which might include the use of jigs and templates, CAD and CAM, and possibly even sales and customer care. Work should be related to the particular outcome in question. Lack of any relevant industrial content can affect the award of top grades. Quality Assurance and Quality Control is not yet being applied well. Testing and evaluation needs more attention in many cases.

Information and Communication Technology

It was noted that the relevant use of ICT was improving. ICT was more highly credited where it was used to support and explain the detail of the project, for example, to present formal views using CAD (including parts/materials/cost lists as well as surveys/tests) and for CAM. The use of new technologies allowed more rapid changes once the first draft of an idea had been completed. Some candidates were making use of CD-ROMs and the Internet for research, though to be of use it has to

be selective and well analysed. Lack of any relevant ICT can affect the highest grades candidates are able to achieve. It was observed that most centres now have access to relevant software and equipment, though it was recognised that many staff and candidates are still at the beginning of a steep learning curve regarding its application within the framework of Technology. Much more equipment was seen in centres this year.

Further Support

Future teacher meetings will address issues that arose out of this year's assessment and procedures. Important issues will continue to cover the changes for the new specifications, especially the time available for projects and how this might be managed. This might include relevant starting points for the highest grades for both full and short courses, the level of project demand, relevant content of folios, weighting of individual sections, knowledge and use of industrial practices and the application and appropriate use of ICT. QA, QC, testing and evaluation is also an issue.

Once again the Principal Moderator and AQA are very grateful for the projects which have been loaned for possible use at teacher meetings and for moderator training.

Staff in many centres are to be congratulated on the way the new specification has been approached. Centres and candidates have continued to take the advice offered at autumn teacher meetings and by coursework advisers. Improvements to project content and approaches have again been noted this year, which is heartening. There is still much ground to cover and new areas of knowledge and skill to assimilate, but it is clear that centres are determined to acquire them for the benefit of their candidates.

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	71.7	22.4
3545/C	95	210	106.6	37.3
Foundation tier overall 3545	--	350	64.01	19.97

		Max. mark	C	D	E	F	G
3545/F boundary mark	raw	125	83	68	53	38	23
	scaled	140	93	76	59	43	26
3545/C boundary mark	raw	95	60	48	36	24	12
	scaled	210	133	106	80	53	27
Foundation tier scaled boundary mark		350	217	176	136	96	56

Higher tier

Component	Maximum Mark (Raw)	Maximum Mark (Scaled)	Mean Mark (Scaled)	Standard Deviation (Scaled)
3545/H	125	140	74.8	15.3
3545/C	95	210	159.7	31.9
Higher tier overall 3545	--	350	66.73	33.67

		Max. mark	A*	A	B	C	D	allowed E
3545/H boundary mark	raw	125	89	81	73	66	53	-
	scaled	140	100	91	82	74	59	-
3545/C boundary mark	raw	95	95	84	72	60	52	-
	scaled	210	210	186	159	133	115	-
Higher tier scaled boundary mark		350	294	269	238	207	165	144

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Provisional statistics for the award

Foundation tier (39,346 candidates)

	C	D	E	F	G
Cumulative %	22.7	52.9	76.2	89.5	96.5

Higher tier (29,479 candidates)

	A*	A	B	C	D	allowed E
Cumulative %	5.4	26.2	48.7	76.7	94.7	97.5

Overall (68,825 candidates)

	A*	A	B	C	D	E	F	G
Cumulative %	2.3	8.7	20.9	45.9	70.9	85.3	92.9	96.9

Short Course

Foundation tier

Component	Maximum Mark (Raw)	Maximum Mark (Scaled)	Mean Mark (Scaled)	Standard Deviation (Scaled)
3555/F	100	120	59.3	18.7
3555/C	95	180	88.7	33.3
Foundation tier overall 3555	--	300	49.40	15.61

		Max. mark	C	D	E	F	G
3555/F boundary mark	raw	100	68	58	48	39	30
	scaled	120	82	70	58	47	36
3555/C boundary mark	Raw	95	60	48	36	24	12
	scaled	180	114	91	68	45	23
Foundation tier scaled boundary mark		300	186	154	123	92	61

Higher tier

Component	Maximum Mark (Raw)	Maximum Mark (Scaled)	Mean Mark (Scaled)	Standard Deviation (Scaled)
3555/H	100	120	65.2	12.6
3555/C	95	180	134.8	30.0
Higher tier overall 3555	--	300	54.33	10.50

		Max. mark	A*	A	B	C	D	allowed E
3555/H boundary mark	raw	100	76	70	64	59	46	-
	scaled	120	91	84	70	71	55	-
3555/C boundary mark	raw	95	95	83	71	60	47	-
	scaled	180	180	157	135	114	89	-
Higher tier scaled boundary mark		300	258	235	209	184	146	127

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Provisional statistics for the award

Foundation tier (1,392 candidates)

	C	D	E	F	G
Cumulative %	19.3	46.8	68.9	84.6	94.5

Higher tier (1,691 candidates)

	A*	A	B	C	D	allowed E
Cumulative %	2.8	17.0	43.5	49.7	91.2	95.3

Overall (3,083 candidates)

	A*	A	B	C	D	E	F	G
Cumulative %	1.5	9.3	23.8	47.0	71.2	83.4	90.4	94.9

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).