



ASSESSMENT and  
QUALIFICATIONS  
ALLIANCE

# General Certificate of Secondary Education

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## Design and Technology (Graphic Products) 3543/3553 2009

Material accompanying this Specification

- Specimen and Past Papers and Mark Schemes
- Reports on the Examination
- Teachers' Guide

# SPECIFICATION

This specification will be published annually on the AQA Website ([www.aqa.org.uk](http://www.aqa.org.uk)). If there are any changes to the specification centres will be notified in print as well as on the Website. The version on the Website is the definitive version of the specification.

Further copies of this specification booklet are available from:

AQA Logistics Centre, Unit 2, Wheel Forge Way, Ashburton Park, Trafford Park, Manchester, M17 1EH.

Telephone: 0870 410 1036 Fax: 0161 953 1177

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## Background Information

### 1

## The Revised General Certificate of Secondary Education

Following a review of the National Curriculum requirements, and the establishment of the National Qualifications Framework, all the unitary awarding bodies have revised their GCSE syllabuses for examination in 2003 onwards.

### 1.1 Changes at GCSE

#### Key Skills

All GCSE specifications must identify, as appropriate, opportunities for generating evidence on which candidates may be assessed in the “main” Key Skills of communication, application of number and information technology at the appropriate level(s). Also, where appropriate, they must identify opportunities for developing and generating evidence for addressing the “wider” Key Skills of working with others, improving own learning and performance and problem solving. Design and Technology is uniquely placed to provide opportunities for all six Key Skills.

#### Spiritual, moral, ethical, social, cultural, environmental, health and safety and European Issues

All specifications must identify ways in which the study of the subject can contribute to an awareness and understanding of these issues.

#### ICT

The National Curriculum requires that students should be given opportunities to apply and develop their ICT capacity through the use of ICT tools to support their learning. In each specification candidates will be required to make effective use of ICT in ways appropriate to the needs of the subject.

#### Tiering

In most subjects the scheme of assessment must include question papers, targeted at two tiers of grades, i.e. A\* - D and C - G.

A safety net of an allowed Grade E will be provided for candidates entered for the higher tier who just fail to achieve Grade D. The questions will still be targeted at A\* - D.

#### Citizenship

From 2002, students in England have been required to study Citizenship as a national curriculum subject. Each GCSE specification must signpost, where appropriate, opportunities for developing citizenship knowledge, skills and understanding.

**1.2 Changes to the Design and Technology Criteria**

The main changes to the Design and Technology criteria are given below.

- a. The Aims have been simplified to reflect the National Curriculum requirements, but it should be noted that they now include a consideration of the influences of past and present design and technology on society.
- b. The Assessment Objectives have been expanded.
  - AO1 consists of materials, components, processes techniques and industrial practices.
  - AO2 combines designing and making into one objective.
  - AO3 evaluation of processes and products includes examining the wider effects of design and technology on society.
- c. Greater emphasis has been placed on ICT, particularly CAD/CAM.

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**1.3 Changes to the Design and Technology (Graphic Products) specification**

The Design and Technology (Graphic Products) specification has been revised and updated to take account of the latest developments in the teaching of graphic products.

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# Specification at a Glance

## *Design and Technology (Graphic Products)*

This specification is one of a suite of seven in Design and Technology offered by AQA. There are two tiers of assessment: Foundation (G-C) and Higher (D-A\*).

GCSE (Full Course) 3543	
Written Paper	40% of total marks
Foundation Tier	2 hours
Higher Tier	2 hours
<p>The paper will test all Assessment Objectives through a range of questions. All questions are compulsory.</p> <p>A Preparation Sheet will be issued to candidates at the beginning of March. This sheet is common to the Full and Short Courses and to the foundation and higher tier papers. It will give advance notice of the design context for some questions on the paper.</p>	
Coursework Project	60% of total marks not to exceed 40 hours
<p>Coursework consists of a project which addresses all the assessment objectives in an integrated way. The evidence required for the project consists of a 3-dimensional product and a concise design folder and/or the appropriate ICT evidence</p>	
GCSE (Short Course) 3553	
Written Paper	40% of total marks
Foundation Tier	1½ hours
Higher Tier	1½ hours
<p>The paper will test all Assessment Objectives through a range of questions. All questions are compulsory.</p> <p>The same Preparation Sheet as for the full course will be issued to candidates at the beginning of March. This sheet is common to the foundation and higher tier papers and will give advance notice of the design context for some questions on the paper.</p>	
Coursework Project	60% of total marks not to exceed 20 hours
<p>Coursework consists of a project which addresses all the assessment objectives in an integrated way. The evidence required for the project consists of a 3-dimensional product and a concise design folder and/or the appropriate ICT evidence.</p>	

  

Foundation Tier	
3543F	←
Higher Tier	
3543H	

  

Foundation Tier	
3553F	←
Higher Tier	
3553H	

## 3

# Availability of Assessment Units and Entry Details

3.1	Availability of Assessment Units	Examinations based on this Specification are available in the June examination series only.
3.2	Entry Codes	<p>Normal entry requirements apply, but the following information should be noted.</p> <p>The <b>Subject Code</b> for entry to the GCSE award is 3543.</p> <p>The <b>Subject Code</b> for entry to the GCSE (Short Course) award is 3553.</p>
3.3	Classification Codes	<p>Each specification is assigned to a national classification code, indicating the subject area to which it belongs.</p> <p>Centres should be aware that candidates who enter for more than one GCSE qualification with the same classification code, will have only one grade (the highest) counted for the purpose of the School and College Performance Tables.</p> <p>The classification code for this specification is 9030.</p>
3.4	Private Candidates	This specification is not available for private candidates.
3.5	Access arrangements and Special Consideration	<p>AQA pays due regard to the provisions of the Disability Discrimination Act 1995 in its administration of this specification.</p> <p>Arrangements may be made to enable candidates with disabilities or other difficulties to access the assessment. An example of an access arrangement is the production of a Braille paper for a candidate with a visual impairment. Special consideration may be requested for candidates whose work has been affected by illness or other exceptional circumstances.</p> <p>Further details can be found in the Joint Council for Qualifications (JCQ) document:</p> <p><i>Access Arrangements and Special Consideration</i></p> <p><i>Regulations and Guidance Relating to Candidates who are Eligible for Adjustments in Examination</i></p> <p><i>GCE, AEA, VCE, GCSE, GNVQ, Entry Level &amp; Key Skills</i></p> <p>This document can be viewed via the AQA web site (<a href="http://www.aqa.org.uk">www.aqa.org.uk</a>)</p> <p>Applications for access arrangements and special consideration should be submitted to AQA by the Examinations Officer at the centre.</p>
3.6	Language of Examinations	All assessments will be through the medium of English. Assessment materials will not be provided in Welsh or Gaeilge.



# Scheme of Assessment

## 4

## Introduction

### 4.1 National Criteria

This GCSE Design and Technology (Graphic Products) specification complies with the following:

- The GCSE Subject Criteria for Design and Technology;
- The GCSE, GCE, GNVQ and AEA Code of Practice April 2007;
- The GCSE Qualification Specific Criteria;
- The Arrangements for the Statutory Regulation of External Qualifications in England, Wales and Northern Ireland: Common Criteria.
- The National Curriculum Order for Design and Technology.

### 4.2 Rationale

Graphic Products is concerned with both visual imagery and the production of 3 dimensional outcomes. Candidates will be expected to demonstrate a wide range of graphic techniques to create, develop and communicate solutions to problems. The solutions will be modelled in compliant materials to convey 3 dimensional concepts to others.

### 4.3 Prior level of attainment and recommended prior learning

The specification builds on the Key Stage 3 programme of study for Design and Technology. It is expected that candidates will have followed this programme before commencing work on this specification.

It will be beneficial for candidates to have achieved at least Level 1 in the Key Skills of *Application of Number, Communication and Information Technology* to cope with the demands of this specification.

### 4.4 Progression

This qualification is a recognised part of the National Qualifications framework. As such, GCSE provides progression from Key Stage 3 through Key Stage 4 to post-16 studies. It lays an appropriate foundation for further study of Design and Technology or related subjects such as VCE Manufacturing.

## Aims

A course based on this specification should encourage candidates to

- a. demonstrate fully their design and technology capability, which requires them to combine skills with knowledge and understanding in order to design and make quality products in quantity;
- b. acquire and apply knowledge, skills and understanding through:
  - analysing and evaluating products and processes;
  - engaging in focused tasks to develop and demonstrate techniques;
  - engaging in strategies for developing ideas, planning and producing products;
  - considering how past and present design and technology, relevant to a designing and making context, affects society;
  - recognising the moral, cultural and environmental issues inherent in design and technology.

# 6

## Assessment Objectives

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### 6.1 Assessment Objectives

Candidates should be able to demonstrate their design and technology capability through acquiring and applying knowledge, skills and understanding:

- a. of materials, components, processes, techniques and industrial practice;
- b. when designing and making quality products in quantity;
- c. when evaluating processes and products and examining the wider effects of design and technology on society.

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### 6.2 Quality of Written Communication

Where candidates are required to produce extended written material in English, they will be assessed on the quality of written communication. Candidates will be required to:

- present relevant information in a form that suits its purposes;
- ensure that text is legible and that spelling, punctuation and grammar are accurate, so that meaning is clear.

Quality of written communication will be assessed in candidates' coursework design folders.

## Scheme of Assessment

7.1 Full Course Assessment Units The Scheme of Assessment comprises two components.

### Written Paper

40% of the marks

Foundation Tier	2 hours	125 marks
Higher Tier	2 hours	125 marks

All questions are compulsory. Questions will test the application of knowledge and understanding of materials, components, processes, techniques, technologies and the evaluation of commercial practices and graphic products.

A Preparation Sheet will be issued to candidates at the beginning of March. This sheet is common to the foundation and higher tier papers and will give advance notice of the design context for some questions on the paper.

Coursework Project 40 hours

60% of the marks 95 marks

The coursework project will be internally assessed and externally moderated. Full details on coursework are given in Sections 14-20 below.

The project should address all three assessment objectives in an integrated way. Candidates are required to submit a concise design folder and/or the appropriate ICT evidence and a 3-dimensional outcome.

Throughout the project candidates should address the industrial and commercial practices, and the moral, social, cultural and environmental issues, arising from their work.

Experience has shown that candidates are often highly motivated where they devise their own project outlines. This is, therefore, to be encouraged and guidelines for the preparation of outlines are given in para 15.1. Examples of suitable project outlines are given in 15.2 which can also provide starting points for candidates.

Centres should ensure that candidates embark on projects that can satisfy the coursework requirements and be completed in 40 hours.

The assessment criteria in Section 16 should be used as a guide for teachers and candidates to the type of work and the standards required.

## 7.2 Short Course Assessment Units

The Scheme of Assessment comprises two components.

### Written Paper

40% of the marks

Foundation Tier	1½ hours	100 marks
Higher Tier	1½ hours	100 marks

All questions are compulsory. Questions will test the application of knowledge and understanding of materials, components, processes, techniques, technologies and the evaluation of commercial practices and graphic products.

The same Preparation Sheet as for the full course will be issued to candidates at the beginning of March. This sheet is common to the foundation and higher tier papers and will give advance notice of the design context for some questions on the paper.

### Coursework Project

20 hours

60% of the marks

95 marks

The coursework project will be internally assessed and externally moderated. Full details on coursework are given in Sections 14–20 below.

For short course projects, it is essential that an appropriate project outline or brief is selected which will allow candidates to satisfy all the requirements within the 20 hours permitted. See Paragraph 14.3 for further guidance.

The project should address all three assessment objectives in an integrated way. Candidates are required to submit a concise design folder and/or the appropriate ICT evidence and a 3-dimensional outcome.

Throughout the project candidates should address the industrial and commercial practices, and the moral, social, cultural and environmental issues, arising from their work.

Experience has shown that candidates are often highly motivated where they devise their own project outlines. This is, therefore, to be encouraged and guidelines for the preparation of outlines are given in para 15.1. Examples of suitable project outlines are given in 15.2 which can also provide starting points for candidates.

The assessment criteria in Section 16 should be used as a guide for teachers and candidates to the type of work and the standards required.

### 7.3 Weighting of Assessment Objectives

For both the full and short courses, the approximate relationship between the relative percentage weighting of the Assessment Objectives (AOs) and the overall Scheme of Assessment is shown in the following table:

Assessment Objectives	Component Weightings (%)		Overall Weighting of AOs (%)
	Coursework	Written Paper	
1 Materials and Components	10	10	20
2 Designing and Making	40	20	60
3 Evaluation and Social Issues	10	10	20
<b>Overall Weighting of Units (%)</b>	<b>60</b>	<b>40</b>	<b>100</b>

Candidates' marks for each assessment unit are scaled to achieve the correct weightings.

# Subject Content

## 8

## Summary of Subject Content

### 9 Designing and Making Skills

Section 9 specifies the general designing and making skills required for both the full and short courses and the knowledge and understanding candidates should acquire.

### 10 Full Course

Section 10 specifies the Full Course content.

### 11 Short Course

Section 11 specifies the Short Course content.

Each course is presented under the following three broad areas of study:

Materials and Components;  
Design and Market Influences;  
Processes and Manufacture.

## Designing and Making Skills

Design and Technology is a practical subject area which requires the application of knowledge and understanding when developing ideas, planning, producing products and evaluating them. The distinction between Designing and Making is a convenient one to make, but in practice the two often merge. For example, research can involve not only investigating printed matter and people's opinions, but also investigating e.g. proportions, adhesives, colour, structures and materials through practical work.

The skills which follow are common to both the Full Course and the Short Course and underpin all learning and cover the programme of study for KS4 Design and Technology.

### 9.1 Designing Skills

#### Candidates should be taught:

to understand the basic design principles of line, form and colour and their application in designing;

to develop and use design briefs, detailed specifications and criteria in relation to product development;

to consider the conflicting demands that moral, cultural, economic, environmental, historical and social issues can make in the planning and in the designing of products;

to consider their own health and safety and that of makers, manufacturers, individual users and society at large;

to consider an increasing range of users of products and different societies in relation to their differing needs and values;

to anticipate and design for product maintenance;

to design for manufacturing in quantity;

to plan for quality control and quality assurance when designing products and to be aware of the difference;

to generate design proposals against stated design criteria, and to modify their proposals in the light of on-going analysis, evaluation and product development;

to use graphic techniques and ICT, including CAD to generate, develop, model and communicate design proposals;

to match materials and components with tools, equipment and processes, taking account of critical dimensions and tolerances when deciding how to manufacture the product;



to produce and use detailed working schedules that will achieve the desired objectives in the time available, setting realistic deadlines for the various stages of manufacture, identifying critical points in the making process and providing alternatives to possible problems;

to devise and apply test procedures to check the quality of their work at critical points during development, and to indicate ways of modifying and improving it when necessary;

to be flexible and adaptable in their designing, in order to respond to problems, changing circumstances and new opportunities;

to ensure that the quality of their design solution will be suitable for intended clients and consumers;

to understand the difference between quality of design and quality of manufacture and use essential criteria to evaluate the quality of products they have made and products which have been made commercially;

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## 9.2 Making Skills

### **Candidates should be taught:**

to match materials and components with tools, equipment and processes to produce quality products;

to use tools and equipment safely, accurately and efficiently to achieve an appropriate fit, finish and reliable functioning in products that match their specifications;

to use a range of industrial applications when working with familiar materials and processes;

to manufacture products singly and in quantity, including the practical application of quality control and quality assurance techniques;

to use computer-aided manufacture (CAM) in single item production and in batch or volume production;

to simulate production and assembly lines including the use of ICT;

to be adaptable in their working practices, in order to respond to changing circumstances and new opportunities;

to ensure, through testing, modification and evaluation, that the quality of their products is suitable for intended users and devise modifications where necessary that would improve performance.

## Full Course

### *Materials and Components*

Candidates should build upon the National Curriculum Key Stage 3 Programmes of Study to develop a working knowledge of a wide range of materials appropriate to modelling, prototyping and manufacturing. Candidates should be aware of the processes and techniques which aid manufacture and of the commercial application of a range of materials used in manufacturing their products in quantity. It is expected that designing and making will address complete product issues and therefore deal with materials associated with the making of production aids, e.g. jigs, moulds, templates etc. as well as dealing with issues such as labelling, packaging etc. It will be important therefore that candidates can utilise a variety of suitable materials and components.

Whilst undertaking product analysis activities, it is expected that candidates will make detailed references to the materials used as well as the associated manufacturing issues.

#### **Candidates should:**

#### **Possible learning experiences**

#### 10.1 Materials and components

understand the physical properties and uses of different types of paper and board (cartridge, layout, bleed proof, tracing, cardboards mounting, Duplex, solid white);

Apply different materials to a situation and evaluate their performance, e.g. grain, hardness, texture, strength, moisture absorption.

understand the physical properties of thermoplastics, (acetate, polyethylenes, polystyrenes, PVC);

Use vacuum forming to create packages and displays.

understand the physical properties of sheet and block modelling materials including: corrugated plastic sheet, foam core board, hard wax, manufactured board, plaster bandage, block foam;

Use correct materials for the task in hand. Make judgements about cost, flexibility, finish, rigidity, strength, quality and weight.

know that some modelling materials require fillers (body filler, plaster) and finishing with acrylic, cellulose and water based paints;

Apply a good quality finish to a model.

know the functions of pigments and 'vehicles' in inks and paints;

Test application on different materials.

**Candidates should:**

have an awareness of new graphic and modelling materials (treated card for ink-jet printing, smart materials, machining foams);

acquire knowledge and skills to be able to use a range of graphic media including: pencils, coloured pencils, airbrush, inks, fine liner pens, felt marker pens, technical pens, paints and transfer letters;

use drawing equipment, set squares, drawing boards, compasses and dividers, rulers, protractors, french curves, flexi-curves;

have an awareness of the role of support equipment i.e. photocopier, light box;

use computer software for CAD/CAM and Desk Top Publishing (DTP);

recognise that graphic imagery can be applied to different surfaces;

use a range of appropriate adhesives: PVA, epoxy resins, spray glues / hot glue, cements, tape, adhesive plastic film and masking fluid;

use safely a range of cutting tools: scalpels and craft knives with mats, scissors (including pattern cutting scissors), rotary cutters, compass cutter, fret saw, die cutter and creasing bars;

use components in 3D work;

**Possible learning experiences**

Use correct media and make judgements about their use.

Use correct equipment and make judgements about their use.

Study graphic imagery of the High Street, e.g. shop signs, vehicle livery, advertising, packaging.

Test the suitability of adhesives for the task, identify hazards and assess the risks.

Select tools appropriate for the need.

Use appropriate fixings to hold materials in their relative positions, e.g. pins, clips, eyelets.

Use additional materials to add details to models e.g. bead pins, sequins, paper fasteners.

## Design and Market Influences

Candidates should develop an understanding of the broad perspectives of the designed world. This will include recognising a need, designing and creating solutions through effective communication of ideas and the means of evaluating the outcome.

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### Candidates should:

### Possible learning experiences

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#### 10.2 Techniques and Processes

recognise that the purpose of the outcome is to communicate a concept to a potential client, manufacturer or purchaser;

Study the role of advertising when a new product is launched.

know the functions of mock-ups and prototypes;

know how 'target marketing' and 'gap in the market' identification are used to promote a product;

Study product placement and advertising techniques such as fashion and peer pressure.

#### Sketching

produce 2D and 3D freehand drawings;

Use 'informal' ruler free drawings as part of thinking and development, to show, visually, ideas to others.

To represent form and shape.

use crating / wire frame techniques to produce drawings of the desired proportion;

Use 'boxing in' to draw 3D objects e.g. draw a familiar household object. To add precision to shape and form. Be familiar with wire frame concepts in CAD software.

#### Enhancement

use grids / underlays to aid sketching;

use pencils, pens and colour to add visual impact to designs and to accentuate shape and form i.e. thin/thick line, hatching, highlighting, shading, dot, line and bar rendering;

Add realism to drawings and sketches.

use textural representation to convey different materials and surfaces i.e. woods, metals, plastics and glass, polished, rough, opaque and transparent;

Add rendering to suggest a variety of surfaces and finishes e.g. polished wood, translucent, plastic, polished steel.

	<b>Candidates should:</b>	<b>Possible learning experiences</b>
Presentation	name the primary and secondary colours;	
	demonstrate an understanding of contrast, complementary, hue and tone;	Experience colour mixing e.g. paints, CAD software.
	apply the language of colour: weight, warm, cold, emotional implications;	Use the vocabulary of colour to express concepts.
	be aware of colour fusion and separation;	Investigate printed pictures and their colour composition e.g. newspaper photographs and on advertising hoarding or T.V. screens.
	recognise paper sizes A2 to A6 and their relationship to each other;	Create booklets from sheets of standard paper.
	mount drawings;	Make card mounts and frames.
	know why fixatives are used to protect drawings;	Consider the reasons why a presentation drawing should be finished.
	demonstrate a knowledge of CAD/CAM graphic manipulation to create images of a graphic product;	Produce summative or formative computer generated images that communicate ideas to another party.
	generate and select suitable lettering;	Add lettering to outcomes, use CAD/CAM or hand created techniques.
	have a knowledge of encapsulation;	Use heat sealed pockets to protect paper products e.g. menus, instructional information.
use photographs;	Use any photograph from any source either self-generated or found, digital or film to record research, stages of designs, end users etc.	

	<b>Candidates should:</b>	<b>Possible learning experiences</b>
Pictorial drawings	produce one point and two point perspective sketches;	Use perspective grids. Investigate the effects of different eye levels and different vanishing point positions on the same object.
	produce isometric drawings;	Use isometric grid paper and instruments to produce drawings.
Working drawings	use third angle orthographic projection;	2D elevations of 3D products.
	use British Standards symbols and conventions;	Apply appropriate dimensions, scales and symbols to drawings.
	demonstrate use of simple assembly and sectional drawings;	Study graphic products and disassemble them.
	interpret room, site plans and maps;	Produce scale drawings of home or school using correct conventions.
Surface development (net)	demonstrate the creation of simple 3D containers from sheet material;	Analyse how simple boxes are assembled.
	know the difference between 'tuck in' and 'automatic bases' for containers;	Investigate commercial boxes e.g. crash base boxes.
	demonstrate a knowledge of CAD/CAM to produce surface developments;	Use computer output devices to plot, score or cut developments.
Information drawings	represent data in graphical form i.e. 2D and 3D bar and pie charts, line graphs and pictographs;	Results of surveys and questionnaires. Use CAD packages.
	understand the language of labels and fit them into enactive, iconic and symbolic groups;	Collect labels and group them into actions, pictorial and abstract symbols.
	understand the role of colour in labelling;	
	recognise the meaning of computer icons used in CAD/CAM software;	List generic computer icons and their functions, e.g. magnification, text, dimensioning etc.
	produce ideograms and pictograms;	Study the international language of signs e.g. telephone, sporting activities, Olympic symbols, airport signs.

	<b>Candidates should:</b>	<b>Possible learning experiences</b>
	produce flowcharts with feedback loops;	Use the correct conventions to draw a system e.g. making an artefact, as part of quality control.
	produce sequential illustrations;	Show how to assemble 'flat pack' furniture.
	produce schematic maps;	Draw route maps. Reduce a route to a straight line, but retain all relevant landmarks.
<b>10.3 Products and applications</b>	distinguish between quality of design and quality of manufacture;	Study a graphic product and analyse the quality of its design (e.g. function, decoration) and the quality of its manufacture (e.g. finish, accuracy, folds).
	establish the needs and wants of customers;	Survey current market trends by using sampling methods and techniques.
	use criteria to judge the quality of a graphic product i.e. meeting a need, fitness of purpose, appropriate use of materials and time;	Draw up a list of desired performance criteria and apply it to a disassembled graphic product.
<b>10.4 Evaluation techniques</b>	know why evaluation is important and its contribution to designing	Identify strengths and weaknesses in a graphic product and suggest modifications and improvements.
	check outcomes against their original specification;	Compare and make informed comments as to why changes were made and how successful they were.
	test the quality of their outcomes;	Devise ways of testing e.g. questionnaires, focus groups etc.
	identify ways in which a product can be tested or evaluated;	Use 'user trip' and performance testing techniques.
	identify the role end users and others play in evaluation;	Ask other possible users to test the product. Ask experts what they think about the product.
<b>10.5 Social, Cultural, Moral and Environmental Issues</b>	recognise that graphical images and products should not offend minority groups;	Debate the different attitudes, beliefs and values of different groups, e.g. religious, gender, handicapped etc.

**Candidates should:**

consider moral and cultural implications of graphic products;

consider environmental issues related to graphic products;

understand the reasons for and consequences of, the increased use of product packaging;

be aware of the advantages and disadvantages of re-cycling and re-using materials;

understand symbols and signs which are a legal requirement;

know symbols and ideograms associated with re-cycling;

consider the implications of increased use of ICT;

**Possible learning experiences**

Debate issues involved with exploitation of natural resources and the effects on indigenous peoples.

Consider cultural and religious preferences e.g. imagery, colour.

Investigate printing and lettering in other cultures.

Investigate consumption of non-renewable and renewable resources, deforestation, effects of single species forest on bio-diversity. Pollution (air/ground), need for virgin materials.

Investigate why products are packaged, giving reasons and consider the problems associated with its disposal.

Identify products which are designed to be re-cycled and which are designed to be refilled.

Collect examples from existing packages and group them into suitable sets, e.g. weight, nutritional information, ingredients.

Investigate the changes that have taken place in your school due to the increased use and availability of ICT.

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**10.6 Information and Communication Technology**

identify the component parts of a CAD/CAM system and know their functions;

recognise different CAD/CAM output devices and their function;

Name the parts and uses of computer systems.

Use various output devices e.g. printers, profile cutter, 2, 2.5, and 3 axis millers.

Use a printer or plotter to produce drawings, a profile cutter for stencils, a three axis miller for shaping modelling foam.



**Candidates should:**

know how images can be input into a computer system and manipulated;

select and use appropriate word processing and Desk Top Publishing software;

use CAD / graphics software;

know the benefits and costs of CAD/CAM;

model outcomes with CAD software i.e. wire-frame, surface modelling, solid modelling;

know that the electronic transfer of data permits designing and manufacturing activities to take place in different geographic locations;

use the world wide web as a research tool;

**Possible learning experiences**

Use scanners, digital cameras and clip art in design folders.

Prepare and present leaflets, brochures etc.

Use orthographic drawings, create art work, data representation in graphic products.

Present a 'slide show'.

Use a vinyl cutter / CNC machine, e.g. consider precision against time learning how to use it.

Create a 'virtual' outcome.

Study where designers work and how their results are communicated to the production sites.

Explore the internet and use appropriate sites.

**10.7 Health and safety issues**

recognise hazards, assess risks and take steps to control the risks to themselves and others;

recognise information relating to legislation intended to protect the public;

recognise symbols and signs relating to quality assurance endorsed by recognised authorities;

use information to assess the immediate and cumulative risks;

Identify safe and unsafe examples relating to design of tools and machines, layout of work spaces, training and manufacturing procedures.

Study packages and identify company name, address, weight/contents, nutritional information, sell-by date.

Collect European Community or British Standards symbols/signs.

Learn signs and symbols associated with a working environment e.g. on machines, on components.

**Candidates should:**

manage their environment to ensure the health and safety of themselves and others;

explain the steps they take to control risks;

**Possible learning experiences**

Know what makes a safe working environment and follow good safety practices, e.g. bladed tools, ventilation, fume extraction, protective clothing.

Design instructional literature.

## ***Processes and Manufacture***

Candidates are expected to be able to make products using a range of materials and processes suitable for one-off or small scale production. They should have a broad understanding of the commercial manufacture of graphic products and the increasing role of CAD/CAM at all levels.

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**Candidates should:**

identify input, process, output and feedback in the production of a graphic product;

draw up a logical order of work and know how this changes as the scale of production increases;

produce a flow chart of a system, show feedback, and apply it to their own work;

know how and why registration marks and colour bars are used in the printing industry;

recognise that the principles of systems and control can be applied to graphics equipment;

understand the principles of simple mechanisms and identify the relevant components and features i.e. levers, linkages, cams and pulleys;

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**Possible learning experiences**

Apply a system to the manufacture of a school based product (a 'mini enterprise') and compare it to that of a commercial product.

Study the commercial production of a graphic product and compare it to 'one-off' apply to school experience.

Produce systems related to common activities (Gantt Chart).

Investigate such marks on printed matter e.g. newspapers, magazines.

Study equipment such as a trimmer, computer plotter and printer, digital camera and identify the components of a system, or the relevant features which permit accurate repetitive operations to produce identical products.

Construct 'pop-up' cards, investigate transmission of motion and force in dynamic models.

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**10.8 Systems and control procedures**

	<b>Candidates should:</b>	<b>Possible learning experiences</b>
<p><b>10.9 Industrial Practices</b></p>	<p>anticipate and design for production in quantity;</p> <p>understand how the method of production changes from single to multiple production;</p> <p>understand the different demands of different scales of production;</p> <p>understand and name the various methods of production i.e. 'one-off', batch, mass and continuous and 'just in time';</p> <p>understand how common graphical products are designed and manufactured;</p> <p>understand how and why quality checks are made in production;</p> <p>demonstrate an understanding of commercial printing methods i.e. letterpress, lithography, flexography, gravure and screen printing;</p> <p>name the four processing colours and know the order of application;</p> <p>name effects used in printing, varnishing (oil, UV, spirit and water), laminating, embossing and foil application;</p> <p>know how multiple surface developments are produced by the use of die cutters and creasing bars;</p> <p>understand that a photocopier can be used to enlarge/reduce and duplicate an original, and that different papers and materials (acetate) can be used.</p> <p>understand how CAD/CAM is used in the production of a graphic product;</p>	<p>Study one off, batch and mass production.</p> <p>Study the manufacture of common commercial graphic products e.g. newspapers, flyers.</p> <p>Identify the correct method for specific graphic products.</p> <p>Investigate packaging, newspapers, posters.</p> <p>Recognising colour registration marks, position marks, use template (in DTP).</p> <p>Match production method to best printing methods for a range of graphic products.</p> <p>Consider and specify the use of special printing effects possible on the candidate's product.</p> <p>Use a photocopier to produce multi-copies of an outline shape on which design variations can be investigated, e.g. a bottle label.</p> <p>Use CAD/CAM in single item, batch or volume production.</p> <p>Use printing, vinyl cutting or CNC techniques to demonstrate the principles involved.</p>

**Candidates should:**

describe the uses of scanner readers and bar codes;

identify devices used to form shapes, position features and aid repetition;

understand the function and need for packaging: protection, need in transportation, storage, security, display, give consumer information;

demonstrate the reduction of waste and show economical use of materials;

know the units by which the thickness of paper, card and board are measured;

**Possible learning experiences**

Investigate the data contained in a bar code and its use in marketing.

Experience patterns, jigs, moulds, formers and templates.

Study marketing examples, analyse a specific commercially produced package.

Plan multiple cut-outs from a given quantity of materials (tessellations).

Compare the weight of paper and its use.

## Short Course

### *Materials and Components*

Candidates should build upon the National Curriculum Key Stage 3 Programmes of Study to develop a working knowledge of a wide range of materials appropriate to modelling, prototyping and manufacturing. Candidates should be aware of the processes and techniques which aid manufacture and of the commercial application of a range of materials used in manufacturing their products in quantity. It is expected that designing and making will address complete product issues and therefore deal with materials associated with the making of production aids, e.g. jigs, moulds, templates etc. as well as dealing with issues such as labelling, packaging etc. It will be important therefore that candidates can utilise a variety of suitable materials and components.

Whilst undertaking product analysis activities, it is expected that candidates will make detailed references to the materials used as well as the associated manufacturing issues.

	<b>Candidates should:</b>	<b>Possible learning experiences</b>
<b>11.1 Materials and components</b>	understand the physical properties and use of cartridge paper, card and board.	Apply different materials to a situation and evaluate their performance e.g. grain, hardness, texture, strength, moisture absorption.
	understand the physical properties of polystyrenes and PVC;	Use vacuum forming to create packages.
	understand the physical properties of sheet and block modelling materials i.e. corrugated plastic sheet, foam core board, card, block form, hard wax.	Use correct materials for the task in hand. Make judgements about cost, flexibility, finish, rigidity, strength, quality and weight.
	know that some modelling materials require fillers and finishing with paint;	Apply a good quality finish to a model.
	know the functions of pigments and 'vehicles' in inks and paint;	Test application on different materials.
	have an awareness of new graphic and modelling materials (treated card for ink-jet printing, smart materials, machining foams);	

<b>Candidates should:</b>	<b>Possible learning experiences</b>
acquire knowledge and skills with pencils, coloured pencils, fine liner pens, felt marker pens, paints;	Use different media and make judgements about their effectiveness.
use drawing equipment, drawing boards, set squares, compasses and dividers, rulers, computer software for CAD/CAM and Desk Top Publishing (DTP);	Use correct equipment and make judgements about their use.
use a range of appropriate adhesives: PVA, spray glues, hot glue and masking fluid;	Test the suitability of adhesives for the task, identify hazards and assess the risks.
use safely a range of cutting tools, craft knives with mat, scissors (including pattern cutting scissors), rotary cutters, fret saw, die cutter and creasing bars;	Select tools appropriate for the need.
use components on 3D work;	Use appropriate fixings to hold materials in their relative positions. Use additional materials to add details to models.

## *Design and Market Influences*

Candidates should develop an understanding of the broad perspectives of the designed world. This will include recognising a need, designing and creating solutions through effective communication of ideas and the means of evaluating the outcome.

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	<b>Candidates should:</b>	<b>Possible learning experiences</b>
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### 11.2 Techniques and Processes

#### Sketching

	recognise that the purpose of the outcome is to communicate a concept to a potential client;	Study the role of advertising when a new product is launched.
	know how 'target marketing' is used to promote a product;	Study product placement and advertising techniques e.g. fashion, peer pressure.
	produce 2D and 3D freehand drawings;	Use 'informal' ruler free drawings as part of thinking and development.
	use crating/wire frame techniques to produce drawings of the desired proportion;	Use 'boxing in' to draw 3D objects e.g. draw a familiar household object.

	<b>Candidates should:</b>	<b>Possible learning experiences</b>
Enhancement	use grids / underlays to aid sketching;	
	use pencils, pens and colour to add visual impact to designs and accentuate shape and form i.e. thick/thin line highlighting;	Add realism to drawings and sketches.
	use textural representation to convey different materials and surfaces, i.e. woods, metals, plastics and glass; name the primary colours; demonstrate an understanding of contrast;	Add rendering to suggest a variety of surfaces and finishes e.g. polished wood, translucent plastic, steel. Experience colour mixing e.g. paints, CAD software.
Presentation	mount drawings;	Make card mounts and frames.
	demonstrate a knowledge of CAD/CAM graphic manipulation to create images of a graphic product;	Produce summative or formative computer generated images that communicate ideas to another party.
Pictorial drawings	use photographs;	Use photography from any source either self-generated or found, digital or film, to record research, sizes of design and users etc.
	produce two point perspective sketches;	
	produce isometric drawings;	Use perspective grids. Use isometric grid paper and instruments to produce drawings.
Working drawings	use third angle orthographic projection;	
	use British Standards symbols and conventions;	Apply the correct dimensions, scales and symbols to drawings.
Surface development (nets)	make boxes based on rectangular and cubic forms;	Analyse commercial packages.
	demonstrate knowledge of CAD/CAM to produce surface developments;	Use computer output devices to plot score/cut developments.
Information drawings	represent data in graphical form i.e. 2D bar and pie charts, and pictograph;	Results of surveys and questionnaires. Use CAD packages.
	produce ideograms and pictograms;	Study the international language of signs e.g. sporting activities, Olympic symbols, airport signs.

**Candidates should:**

produce flowcharts with feedback loops;

produce sequential illustrations;

**Possible learning experiences**

Use the correct conventions to draw a system, e.g. making an artefact, as part of quality control.

Show how to assemble 'flat pack' furniture.

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**11.3 Products and applications**

distinguish between quality of design and quality of manufacture;

establish the needs and wants of customers;

use criteria to judge the quality of a graphic product i.e. meeting a need, fitness of purpose and appropriate use of materials and time;

Study a graphic product and analyse the quality of its design (e.g. function, decoration) and the quality of its manufacture (e.g. finish, accuracy, folds).

Survey current market trends by sampling methods and techniques.

Draw up a list of desired performance criteria and apply it to a disassembled graphic product.

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**11.4 Evaluation techniques**

know why evaluation is important and its contribution to designing;

check outcomes against original specification;

identify the role end users and others play in evaluation;

Identify strengths and weaknesses in a graphic product and suggest modifications and improvements.

Compare and make informed comments as to why changes were made and how successful they were.

Ask other possible users to test the product. Ask experts what they think about the product.

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**11.5 Social, cultural, moral and environmental issues**

recognise that graphical images and products should not offend minority groups;

consider moral and cultural implications of graphic products;

Debate the different attitudes, beliefs and values of different groups, e.g. religious, gender, handicapped etc.

Debate issues involved with exploitation of natural resources and the effects on indigenous peoples.

Consider cultural and religious preferences e.g. imagery, colour.

Investigate printing and lettering.

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	<b>Candidates should:</b>	<b>Possible learning experiences</b>
	<p>consider environmental issues related to graphic products;</p> <p>understand the reasons for, and consequences of, the increased use of product packaging;</p> <p>be aware of the advantages and disadvantages of re-cycling;</p> <p>know symbols and ideograms associated with re-cycling;</p>	<p>Investigate consumption of non-renewable and renewable resources, deforestation, effects of single species forests on bio-diversity. Pollution (air/ground)/ need for virgin materials.</p> <p>Investigate why products are packaged, giving reasons and consider the problems associated with the disposal.</p> <p>Identify products which are designed to be re-cycled and which are designed to be refilled.</p>
<b>11.6 Information and Communication Technology</b>	<p>identify the component parts of a CAD/CAM system;</p>	<p>Name the parts of a computer systems. Use various output devices e.g. printer, profile cutter, 2, 2.5 and 3 axis millers.</p>
	<p>know how images can be input into a computer system and manipulated;</p>	<p>Use scanners, digital cameras and clip art in design folders.</p>
	<p>use Desk Top Publishing software;</p>	<p>Prepare and present leaflets, brochures, etc.</p>
	<p>use CAD / graphics software;</p>	<p>Use orthographic drawings, create art work.</p>
	<p>know the benefits and costs of CAD/CAM;</p>	<p>Use a vinyl cutter / CNC machine, e.g. consider precision against time learning how to use it.</p>
	<p>use the world wide web as a research tool;</p>	<p>Explore the internet and use appropriate sites.</p>
<b>11.7 Health and safety issues</b>	<p>recognise hazards, assess risks and take steps to control the risks to themselves and others;</p>	<p>Identify safe working practice.</p>
	<p>recognise information relating to legislation intended to protect the public;</p>	<p>Study packages and identify company name, address, weight/contents, nutritional information, sell-by date.</p>
	<p>recognise symbols and signs relating to quality assurance endorsed by recognised authorities;</p>	<p>Collect European Community or British Standards symbols/signs.</p>

**Candidates should:**

manage their environment to ensure the health and safety of themselves and others;

**Possible learning experiences**

Know what makes a safe working environment and follow good safety practices, e.g. bladed tools, ventilation, fume extraction, protective clothing.

## Processes and Manufacture

Candidates are expected to be able to make products using a range of materials and processes suitable for one-off or small scale production. They should have a broad understanding of the commercial manufacture of graphic products and the increasing role of CAD/CAM at all levels.

**Candidates should:**

**Possible learning experiences**

**11.8 Systems and control procedures**

identify input, process, output and feedback in the production of a graphic product;

Apply a system to the manufacture of a school based product (a 'mini-enterprise') and compare it to that of a commercial product.

draw up a logical order of work;

Study the commercial production of a graphic product and compare it to 'one-off, apply to school experience.

produce a flow chart of a system, show feedback;

Produce systems related to common activities (Gantt chart).

know how and why registration marks and colour bars are used in the printing industry;

Investigate such marks on printed matter e.g. newspapers, magazines.

**11.9 Industrial practices**

anticipate and design for production in quantity;

Study one off and mass production.

understand and name the various methods of production i.e. 'one-off', batch, mass and continuous, and 'just in time';

Identify the correct method for specific graphic products.

understand how common graphical products are designed and manufactured;

Investigate packaging, newspapers, posters.

**Candidates should:**

understand how and why quality checks are made in production;  
demonstrate an understanding of lithography printing;  
name the four processing colours and know the order of application;  
name effects used in print finishing, varnishing, laminating, embossing and foil application;  
understand how CAD/CAM is used in the production of a graphic product;  
demonstrate the economical use of waste;  
know the units by which the thickness of paper, card and board are measured.

**Possible learning experiences**

Recognising colour registration marks, position marks, use template (in DTP).  
Consider and specify the use of special printing effects, possibly on the candidate's product.  
Use CAD/CAM in single item, batch or volume production. Use printing, vinyl cutting or CNC techniques to demonstrate the principles involved.  
Plan multiple cut-outs from a given quantity of materials (tessellations).  
Compare the weight of paper and its use.

## Key Skills and Other Issues

12

# Key Skills – Teaching, Developing and Providing Opportunities for Generating Evidence

### 12.1 Introduction

The Key Skills Qualification requires candidates to demonstrate levels of achievement in the Key Skills of *Application of Number, Communication and Information Technology*.

The units for the ‘wider’ Key Skills of *Improving own Learning and Performance, Working with Others* and *Problem-Solving* are also available. The acquisition and demonstration of ability in these ‘wider’ Key Skills is deemed highly desirable for all candidates, but they do not form part of the Key Skills Qualification. Design and Technology, however, does offer a unique opportunity for candidates to provide evidence for all six Key Skills.

Copies of the Key Skills Units may be downloaded from the QCA Website (<http://www.qca.org.uk/keyskills>).

The units for each Key Skill comprise three sections:

- A What you need to know.
- B What you must do.
- C Guidance.

Candidates following a course of study based on this Specification for Design and Technology (Graphic Products) can be offered opportunities to develop and generate evidence of attainment in aspects of the Key Skills of *Application of Number, Communication, Information Technology, Improving own Learning and Performance, Working with Others* and *Problem-Solving*. Areas of study and learning that can be used to encourage the acquisition and use of Key Skills, and to provide opportunities to generate evidence for Part B of the units, are signposted below.

### 12.2 Key Skills Opportunities in Design and Technology (Graphic Products)

The broad and multi-disciplinary nature of Design and Technology makes it an ideal vehicle to help candidates develop their knowledge and understanding of all Key Skills and to produce evidence of their application. It should be noted that, while *Working with Others* is an important aspect of Design and Technology, the work candidates submit for coursework assessment must be their own.

### Application of Number Level 1

What you must do ...	Signposting of Opportunities for Generating Evidence in Subject Content
<b>N1.1</b> Interpret information from different sources	9.1, 10.2 – 10.9, 11.2 – 11.9
<b>N1.2</b> Carry out calculations	10.1, 10.2, 10.8, 11.1, 11.2, 11.8
<b>N1.3</b> Interpret results and present findings	9.1, 10.4, 11.4

### Application of Number Level 2

What you must do ...	Signposting of Opportunities for Generating Evidence in Subject Content
<b>N2.1</b> Interpret information from different sources	9.1, 10.2 – 10.9, 11.2 – 11.9
<b>N2.2</b> Carry out calculations	10.1, 10.2, 10.8, 11.1, 11.2, 11.8
<b>N2.3</b> Interpret results and present findings	9.1, 10.4, 11.4

### Communication Level 1

What you must do ...	Signposting of Opportunities for Generating Evidence in Subject Content
<b>C1.1</b> Take part in discussions	9.1, 10.5, 11.5
<b>C1.2</b> Read and obtain information	9.1, 10.1 10.3 – 10.9, 11.3 – 11.9
<b>C1.3</b> Write different types of documents	9.1, 10.3, 10.4, 11.3, 11.4

### Communication Level 2

What you must do ...	Signposting of Opportunities for Generating Evidence in Subject Content
<b>C2.1a</b> Contribute to discussions	9.1, 10.4, 11.4
<b>C2.1b</b> Give a short talk	10.4, 11.4
<b>C2.2</b> Read and summarise information	9.1, 10.2, 10.3, 11.2, 11.3
<b>C2.3</b> Write different types of documents	9.1, 10.2 – 10.4, 11.2 – 11.4

### Information Technology Level 1

What you must do ...	Signposting of Opportunities for Generating Evidence in Subject Content
<b>IT1.1</b> Find, explore and develop information	9.1, 10.3, 11.3
<b>IT1.2</b> Present information, including text, numbers and images	9.1, 10.2, 11.2

### Information Technology Level 2

What you must do ...	Signposting of Opportunities for Generating Evidence in Subject Content
<b>IT2.1</b> Search for and select information	9.1, 10.3, 11.3
<b>IT2.2</b> Explore and develop information and derive new information	9.1, 10.3, 11.3
<b>IT2.3</b> Present combined information, including text, numbers and images	9.1, 10.2, 11.2

### Working with Others Level 1

What you must do ...	Signposting of Opportunities for Generating Evidence in Subject Content
<b>WO1.1</b> Confirm what needs to be done and who is to do it	9.1, 10.4, 11.4
<b>WO1.2</b> Work towards agreed objectives	9.1, 10.3, 10.8, 11.3, 11.8
<b>WO1.3</b> Identify progress and suggest improvements	9.1, 10.4, 11.4

### Working with Others Level 2

What you must do ...	Signposting of Opportunities for Generating Evidence in Subject Content
<b>WO2.1</b> Plan work and confirm working arrangements	9.1, 10.4, 11.4
<b>WO2.2</b> Work cooperatively towards achieving identified objectives	9.1, 10.3, 10.4, 10.8, 11.3, 11.4, 11.8
<b>WO2.3</b> Exchange information on progress and agree ways of improving work with others	9.1, 10.4, 11.4

### Improving own Learning and Performance Level 1

What you must do ...	Signposting of Opportunities for Generating Evidence in Subject Content
<b>LP1.1</b> Confirm, short term targets and plan how these will be met	9.1
<b>LP1.2</b> Follow plan to meet targets and improve performance	9.1
<b>LP1.3</b> Review progress and achievement.	9.1, 10.4, 11.4

### Improving Own Learning and Performance Level 2

What you must do ...	Signposting of Opportunities for Generating Evidence in Subject Content
<b>LP2.1</b> Help set short-term targets and plan how these will be met	9.1
<b>LP2.2</b> Use plan and support from others, to meet targets	9.1
<b>LP2.3</b> Review progress and identify evidence of achievements	9.1, 10.4, 11.4

### Problem Solving Level 1

What you must do ...	Signposting of Opportunities for Generating Evidence in Subject Content
<b>PS1.1</b> Confirm understanding of given problems	9.1, 10.3, 10.4, 11.3, 11.4
<b>PS1.2</b> Plan and try out ways of solving problems	9.1, 10.3, 10.8, 11.3, 11.8
<b>PS1.3</b> Check if problems have been solved and describe the results	9.1, 9.2, 10.4, 11.4

### Problem Solving Level 2

What you must do ...	Signposting of Opportunities for Generating Evidence in Subject Content
<b>PS2.1</b> Identify problems and come up with ways of solving them	9.1, 10.3, 10.4, 11.3, 11.4
<b>PS2.2</b> Plan and try out options	9.1, 10.3, 10.8, 11.3, 11.8
<b>PS2.3</b> Apply given methods to check if problems have been solved and describe the results	9.1, 9.2, 10.4, 11.4



### 12.3 Further Guidance

More specific guidance and examples of tasks that can provide evidence of single Key Skills, or composite tasks that can provide evidence of more than one Key Skill are given in the AQA specification support material, particularly the Teachers' Guide.

# 13

## Spiritual, Moral, Ethical, Social, Cultural and Other Issues

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- 13.1 Spiritual, Moral, Ethical, Social, Cultural and Other Issues**
- The study of Design and Technology should contribute substantially to candidates' understanding of moral, ethical, social and cultural issues. Such issues underlie all design and manufacturing activities and are explicitly referred to in Sections 9.1 to 11.9 of the Subject Content. These issues will be tested in both coursework and the written paper.
- 
- 13.2 European Dimension**
- AQA has taken account of the 1988 Resolution of the Council of the European Community in preparing this specification and associated specimen papers.
- 
- 13.3 Environmental Issues**
- AQA has taken account of the 1988 Resolution of the Council of the European Community and the Report “*Environmental Responsibility: An Agenda for Further and Higher Education*” 1993 in preparing this specification and associated specimen papers.
- Environmental considerations are important to the development of all designs and products. Awareness of these issues is specifically required in all sections of the Subject Content and will be tested in both components. See Section 15 for details of coursework requirements.
- 
- 13.4 Citizenship**
- In the Key Stage 4 programme of study for Citizenship, *Developing skills of enquiry and communication* (Section 2) and *Developing skills of participation and responsible action* (Section 3) naturally parallel candidates' actions and approaches during project work. For example, the effects of certain products or manufacturing systems on society and the individual are matters of interest in design and technology, but they also touch on Section 2(a) of the programme of study. Similarly, the designer needs to empathise with the end user (Section 3(a)) and in the process of designing needs to negotiate with clients or during market research to determine and achieve the desired ends (Section 3(b)).
- 
- 13.5 Avoidance of Bias**
- AQA has taken great care in the preparation of this specification and associated specimen papers to avoid bias of any kind.
- 
- 13.6 Health and Safety**
- Health and Safety impinges on all aspects of Design and Technology and requires consideration in terms of the maker, the manufacturer, the individual user and society at large. Health and Safety and related issues should therefore be an integral part of all teaching. They are expected to be considered in the coursework and will also be tested in the written paper.
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## Centre-Assessed Component

14

### Nature of the Centre-Assessed Component

#### 14.1 The nature of Design and Technology

The distinguishing feature of any design and technology course is its practical nature. Knowledge and understanding is not therefore to be acquired purely for its own sake, but in order to satisfy the needs of clients and consumers, and the constraints placed on manufacturers in industrial and commercial contexts.

For Graphic Products, candidates will need to be familiar with a range of material areas and the use of CAD/CAM in production.

Underpinning all learning are the designing and making skills which make use of knowledge and understanding in order to produce outcomes which satisfy a design brief.

#### Designing

Designing is a process based activity involving the progressive engagement with a problem which requires thinking, creating, inventing, predicting, experimenting, decision making, constant evaluation and, where necessary, modification. Designers develop an awareness of the opportunities and constraints placed upon them by taking account of the demands of users and producers, market forces and the effects their products can have on society and the environment.

The activities detailed above draw upon relevant skills and knowledge which are enriched by the application of human values.

#### Making

The realisation of design ideas and solutions to problems is achieved by making products where a range of materials and media may be used. In design and technology, making activities may take many forms, ranging through early experimentation, testing and trials to a final marketable product. All the aspects detailed above provide opportunities for students to develop making skills as they seek to produce high quality outcomes.

#### Communication

Communication is an integral aspect of the whole process and it plays three major roles in any design and technology activity.

First, it enables the designer to visualise ideas and thoughts which permit detailed analysis. Second, it provides a record which can be referred to, adapted or refined as the process progresses. Third, it provides an explanation for others of the development of ideas from the mind to the outcome.

The range of communication methods is wide and becoming wider through the increasing use of ICT. All or any should be used *as appropriate to the task in hand* – notes, sketches, formal drawings, photographs, computer programs, oral communication and two or three dimensional representations are all relevant in particular circumstances.

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## 14.2 The Coursework Project (Full and Short Courses)

Candidates are required to submit a single integrated project which consists of a *concise* design folder and/or appropriate ICT evidence and a 3-dimensional outcome. Depending on the nature and requirements of the project, the outcome may be an appropriate single 3-D outcome, or an integrated range of items of which 3D outcomes should dominate e.g. a charity collecting box with associated promotional material.

A graphic product outcome is likely to be a product prototype, i.e. a model, a representation of reality. It is not expected that the product is necessarily a completely, fully functioning object, but its finish, presentation and detail should realistically represent a ‘real’ artefact. Some outcomes may be complete and fully functioning products, e.g. musical greetings cards, children’s activity books. The purpose of the outcome is to communicate a concept to a potential client, manufacturer or purchaser. The candidate is the designer/manufacturer who needs to envisage the potential of the product for commercial production. The whole activity should not exceed 40 hours for the Full Course or 20 hours for the Short Course.

The main materials required for making graphic products are given in para 10.1 of the specification (and in para 11.1 of the short course). Candidates’ coursework will be assessed primarily and substantially on their use of graphic materials and their application of graphic skills, although other materials may also be used. Other materials should, however, complement and not be a major part of the graphic product. For example, resistant materials or manufactured board are likely to be needed to produce patterns, jigs, moulds and possibly framework, etc; acrylic sheet may be needed to display and protect notices, menus, etc.

Candidates wishing to make considerable use of materials other than graphic materials should be guided towards the Design and Technology (Resistant Materials Technology) or Design and Technology (Product Design).

GCSE Design and Technology involves increased emphasis on the industrial aspects of designing and making, particularly in the use of CAD/CAM, and on the wider effects of technological activity on society and the environment. These elements should therefore be evident in candidates’ projects.

Candidates wishing to work with others may do so. Centres must ensure, however, that candidates select appropriate projects and provide individual and separate evidence of their own ability to design and make a quality product from start to finish.

Candidates may use the Board-set project outlines given in paragraph 15.2 below, formulate their own briefs or use briefs set by the centre. The centre is responsible for ensuring candidates attempt projects which satisfy the coursework requirements (see Section 16 below).

Candidates may enter for any other GCSE Specification at the same sitting. However the submission of the same piece of coursework for more than one specification is prohibited.

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### 14.3 The Short Course Project

Quality designing and quality making are requirements for any Design and Technology project. With only 20 hours available for short course projects, however, it becomes particularly important that candidates use their time in the most profitable and effective way. The following advice is given to help teachers and candidates, but teachers will find fuller guidance in the Teachers' Guide.

The identification of a suitable task is a crucial factor in managing the short course project. Candidates undertaking short course projects should be guided by teachers to smaller, more focused or less complex problems than might be expected for a full course project. It should be noted, however, that the requirement for *quality* work is the same as for the full course, regardless of the scale of the work.

Candidates may use the Board-set project outlines given in paragraph 15.2 below, formulate their own briefs or use briefs set by the centre. The centre is responsible for ensuring candidates attempt projects which satisfy the coursework requirements (see Section 16 below).

Time management is another important element for successful short course projects. It is recommended that, before the project period begins, teachers provide a time plan for candidates, which allows realistic and proportionate time for the various stages and activities.

Time spent on an initial analysis of the problem will help to reduce or eliminate wasteful, unfocused research. Focused research can in turn reduce the time needed for a careful analysis.

Short course candidates are not expected to generate the same quantity of ideas as full course candidates, although the same level of creative ideas is still expected. The more focused analysis and research should help in producing a workable design solution more quickly.

Making skills represent two-thirds of the project marks and this should have been taken into account in the pre-planning stage. A quality product is still expected, but it does not need to be large or complex to gain high marks. The product does need, however, to include a variety of skills, techniques and/or processes that are completed to a high standard, and which overall satisfy the design objectives.

## Guidance on Setting the Centre-Assessed Component

### 15.1 Project Outlines

Project outlines are given in para 15.2 for Design and Technology (Graphic Products) full and short courses. Centres may use these or adapt them to meet the needs of their candidates. Centres wishing to develop their own outlines for candidates should take note of the following guidelines.

The checklist below is given to help teachers ensure that the project outlines they prepare will meet both the needs of candidates and the requirements of the specification. Prior approval of centre devised project outlines is not required.

- a. Does the outline encourage an integrated approach to designing and making and represent a *level of demand* appropriate to the individual candidate's ability?
- b. Has the outline or problem been so written that candidates will be able to demonstrate the highest level of their ability in each Assessment Objective?
- c. Where a single outline, e.g. design and make a teaching aid, is to be presented to a number of candidates covering a wide ability range, has each candidate produced a brief for him/herself that will be challenging, but not daunting?
- d.
  - Does the project outline offer scope for candidates to consider:
  - the effects and implications of technological activity (e.g. industrial, social, moral, cultural, economic, environmental factors);
  - systems and control;
  - provision for product maintenance;
  - repetition skills (e.g. multiple production);
  - use of CAD/CAM and ICT skills in general;
  - product quality;
  - health and safety in relation to the maker and others?
- e. Are the resources, equipment, tools, materials and media available for the potential demands of the project?
- f. Can the project be completed satisfactorily in 40 hours for the full course or in 20 hours for the short course?

- g. Will the task permit sufficient supervision to enable the teacher to certify that the candidate's work is his/her own?

Where candidates work with others, it must be possible to identify the individual contribution of each candidate, so that the requirements in the specification are met.

- h. Is the project outline free from political, ethnic, gender and other forms of bias?

## 15.2 Project Outlines

The following project areas are provided as suitable examples from which project outlines can be created. These areas are not intended to be exhaustive or exclusive. The major part of any project will be the 3D outcome.

1. Activity packs for children, adults.
2. Advertisements.
3. Books – including activity, pop-up, travel and inter-active.
4. Calendar – Advent – Eid – Diwali, etc.
5. Corporate identity.
6. Display – point of sale, for windows and free standing.
7. Educational resource material.
8. Games – board – educational – entertaining – travel.
9. Greetings cards – various occasions – set of – pop-ups – mechanical – electronic.
10. Information – guide books, flyers, leaflets, information packs, posters, signs, conference.
11. Instructions on how to make/assemble/construct/do, e.g. flat pack kitchen cupboards.
12. Magazines – comics.
13. Map – plans.
14. Mobiles.
15. Money boxes – collecting boxes – charity items.
16. Packaging – food, drinks, sweets, confectionery, cosmetics, household items.
17. Paper kits – model villages, cereal pack models.
18. Programmes for cinema/theatre and other material with a short life.
19. Promotional items – menus, mats, decorations.
20. Record, CD, video – sleeves, boxes.
21. School publications – handbook, newsletters, prospectus.
22. Souvenirs – gift items.

23. Stamps, coins, phone cards with presentation pack.
24. Symbols, trademarks.
25. Teaching aids.

Some specific examples of project outlines are given below as possible starting points for candidates for both the full and short courses. Candidates may use these, adapt them or devise their own.

#### Full Course

1. Design and make a travelling board game for a child, teenager or an adult.
2. Design and make promotional material for a charity.
3. Design and make a point of sale display to launch a new product.
4. Design and make packaging for a range of fast food products.
5. Design and make a child's shadow theatre.

#### Short Course

1. Design and make new ISP (Internet Service Provider) CD promotional packaging.
2. Design and make museum souvenirs e.g. book mark, badge, leaflet, eraser, pencil set.
3. Design and make a 3D calendar to promote a company's products or services.
4. Design and make a new card game.
5. Design and make packaging and instructions for an electronic hand held game.

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#### 15.3 Support Material

Further examples of project outlines are included in the *Teachers' Guide*. Other material to support teachers will be produced for the annual teachers' meetings in the Autumn Term.

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#### 15.4 Coursework Advisers

Coursework Advisers will be available to assist centres with any matters relating to coursework. Details will be provided when AQA knows which centres are following the specification.



## 16

# Assessment Criteria

## 16.1 Introduction

Teachers are required to determine grades separately for the designing and making elements of their candidates' coursework. To do this they must use their professional judgement in conjunction with the Assessment Criteria given in 16.3 below.

The level of demand of a design brief should influence the interpretation of the criteria. A successful project which makes great demands on skills, cognitive abilities and breadth and depth of knowledge should be more highly rewarded than a successful project with fewer demanding aspects.

Quality of work is more important than quantity and size. For this reason no estimate of the number of pages in a design folio or of the size and complexity of the product is given. Candidates should, however, plan to produce **concise** design folders and 3D outcomes which can reasonably be completed, in total, in no more than 40 hours for the full course and 20 hours for the short course.

Candidates wishing to work with others may do so. Centres must ensure, however, that candidates select appropriate projects and provide individual and separate evidence of their own ability to design and make a quality product from start to finish.

The Assessment Criteria give guidance on the expected levels of achievement in Designing Skills and Making Skills for grades G-A. Teachers should note that A\* does not feature as a coursework grade. A\* grades are determined arithmetically on the total marks gained for the examination and are available only for candidates who have taken a Higher Tier paper.

As in any holistic assessment, a weak performance in one aspect of a candidate's work may be balanced by a strong performance in another. The principle of "best fit" should be applied when using these criteria.

An assessment of the quality of written communication in the design folder is to be made according to the criteria given in 16.4.

Centres are strongly recommended to provide candidates with feedback as their work progresses. This can not only encourage or reward the candidates, but it can also ease the assessment burden on teachers at the end of the coursework period.

Teachers should not record their comment on candidates' work; any written comments should be recorded on the Candidate Record Form.

## 16.2 Assessment Procedure

An assessment of a candidate's coursework should follow the pattern given below.

- a. Guided by the criteria, assess the Designing Skills in terms of a whole grade, e.g. Grade C.
- b. Refine that decision to High (H), Middle (M) or Low (L). A candidate only just achieving the required standard should be given the lowest assessment in the grade, (L), while a candidate just failing to reach the grade above should be given the highest in the grade (H).
- c. Repeat a. and b. above for Making Skills.
- d. Record the refined grade for Designing (e.g. High B = HB) and the refined grade for Making (e.g. Mid E = ME) on page 4 of the Candidate Record Form.
- e. Using the *Project Assessment Matrix* (Appendix D), derive from the two grade decisions a single mark. For example, a High B for Designing and a Mid E for Making will produce a mark of 52.
- f. Record the mark derived from the matrix in the space on page 4.
- g. Using the criteria below, make an overall assessment of candidates' completed design folders for the quality of written communication (QWC) and determine a mark out of a maximum of 5 marks.
- h. Record the QWC mark in the space provided on page 4.
- i. Add together the Matrix mark and the QWC mark and write the total out of 95 in the Total Mark box.
- j. The total mark for each candidate is to be recorded on the AQA mark sheet which will be sent to centres in the Spring Term.

**16.3 Assessment Criteria Candidates will have:**

Grade	Designing	Making
<b>G</b>	<ol style="list-style-type: none"> <li>gathered minimal research information;</li> <li>provided little evidence of analysis of task or research;</li> <li>produced a simple specification;</li> <li>produced a solution, with rudimentary forward planning;</li> <li>attempted a superficial evaluation of the outcome of their work;</li> <li>demonstrated very limited communication, graphical and ICT skills;</li> <li>provided little or no evidence of having considered industrial practices and systems and control.</li> </ol>	<ol style="list-style-type: none"> <li>used materials, components and equipment safely under close supervision;</li> <li>produced references to the use of CAM where appropriate;</li> <li>produced an undemanding or incomplete outcome;</li> <li>some evidence of QA and QC.</li> </ol>
<b>F</b>	<ol style="list-style-type: none"> <li>used more than one source to gather research information;</li> <li>made a limited attempt to analyse the task and the research material;</li> <li>produced a generalised specification;</li> <li>produced at least two proposals which satisfy parts of the specification;</li> <li>used a proposal to produce the outcome with little development and forward planning;</li> <li>superficially tested and evaluated their work against original intentions;</li> <li>demonstrated limited communication, graphical and ICT skills;</li> <li>provided limited evidence of having considered industrial practices and systems and control.</li> </ol>	<ol style="list-style-type: none"> <li>used materials, components and equipment correctly and safely (including CAM if appropriate);</li> <li>produced a largely complete but undemanding outcome;</li> <li>demonstrated accuracy and finish in some parts of the product;</li> <li>produced evidence of some QA and QC.</li> </ol>
<b>E</b>	<ol style="list-style-type: none"> <li>used a limited number of sources to gather research information;</li> <li>made a superficial analysis of the task and most of the research material;</li> <li>produced a specification which reflects the most obvious features of the analysis;</li> <li>produced some proposals which satisfy most of the specification;</li> <li>used their proposals and relevant knowledge to produce a solution which satisfies most of the specification;</li> <li>demonstrated some forward planning;</li> <li>tested and evaluated some aspects of their work;</li> <li>used some appropriate communication, graphical and ICT skills to convey design ideas;</li> <li>provided limited evidence of having considered industrial practices and systems and control.</li> </ol>	<ol style="list-style-type: none"> <li>corrected working errors where necessary;</li> <li>used materials, components, equipment and processes correctly and safely (including CAM if appropriate);</li> <li>produced a largely complete and largely effective outcome;</li> <li>demonstrated a fair degree of accuracy and finish in the overall product;</li> <li>applied QA and QC broadly but superficially.</li> </ol>
<b>D</b>	<ol style="list-style-type: none"> <li>used several appropriate sources to gather relevant research information;</li> <li>made a simple analysis of the task and all research material;</li> <li>produced a specification which reflects most of the analysis;</li> <li>produced several proposals which satisfy the specification;</li> <li>used their proposals and relevant knowledge to develop a solution which satisfies the specification;</li> <li>planned sequence of making activities;</li> <li>tested and evaluated most aspects of their work and made some appropriate modifications;</li> <li>used appropriate communication, graphical and ICT skills to convey design ideas;</li> <li>provided limited evidence of having considered relevant industrial practices and systems and control.</li> </ol>	<ol style="list-style-type: none"> <li>appropriately corrected working errors;</li> <li>used appropriate materials, components, equipment and processes correctly and safely (including CAM);</li> <li>produced an effective and largely complete outcome;</li> <li>demonstrated a reasonable level of accuracy and finish in the product;</li> <li>applied QA and QC broadly.</li> </ol>

**Candidates will have:**

Grade	Designing	Making
<b>C</b>	<ol style="list-style-type: none"> <li>used a variety of appropriate sources to gather and order relevant research information;</li> <li>analysed the task and the research material;</li> <li>produced a specification which reflects the analysis;</li> <li>produced a range of proposals which satisfy the specification;</li> <li>used their proposals and relevant knowledge to develop a detailed design solution which satisfies the specification;</li> <li>planned a largely correct, and workable, sequence of main making activities;</li> <li>tested, evaluated and modified their work throughout the process as appropriate;</li> <li>used a range of communication, graphical and ICT skills sufficient to convey ideas to themselves and others;</li> <li>provided evidence of having considered relevant issues, industrial practices and systems and control.</li> </ol>	<ol style="list-style-type: none"> <li>recognised the need for and justified any changes or adaptations;</li> <li>used appropriate materials, components, tools, equipment and processes (including CAM) correctly and safely;</li> <li>produced a complete, effective and well-assembled outcome;</li> <li>demonstrated a level of accuracy and finish in the product which satisfies most of the demands of the design solution;</li> <li>clearly used QA and QC to control quality in most activities.</li> </ol>
<b>B</b>	<ol style="list-style-type: none"> <li>produced a well ordered and relevant range of appropriate research information;</li> <li>thoroughly analysed the task and research material;</li> <li>produced a detailed specification closely reflecting the analysis;</li> <li>produced a wide range of proposals which satisfy the specification;</li> <li>used their proposals and relevant knowledge of techniques, manufacturing and working characteristics of materials to develop a detailed design solution;</li> <li>planned the correct sequence of making activities;</li> <li>tested, evaluated and modified their work throughout the process as appropriate;</li> <li>used an appropriate range of communication, graphical and ICT skills sufficient to convey ideas to themselves and others effectively;</li> <li>provided evidence of having considered relevant issues, industrial practices and systems and control.</li> </ol>	<ol style="list-style-type: none"> <li>recorded and justified the need for any changes or adaptations;</li> <li>used appropriate materials, components, tools, equipment and processes (including CAM) skilfully, correctly and safely;</li> <li>made a complete, effective and skilfully-produced outcome;</li> <li>demonstrated a level of accuracy and finish in the product which satisfies the demands of the design solution;</li> <li>provided evidence of QA &amp; QC throughout manufacture.</li> </ol>
<b>A</b>	<ol style="list-style-type: none"> <li>used a wide variety of appropriate sources to gather relevant research information;</li> <li>analysed the task and the research material logically, thoroughly and effectively;</li> <li>produced a detailed specification which focuses closely on the analysis;</li> <li>produced a wide range of distinct proposals which satisfy the specification;</li> <li>used one or more of their proposals and relevant knowledge of techniques, manufacturing and working characteristics to develop a detailed and coherent design solution;</li> <li>produced a correct sequence of activities which shows where, why and how practical production decisions were made;</li> <li>tested, objectively evaluated and effectively modified their work throughout the process as appropriate;</li> <li>selected and skilfully used a wide range of communication, graphical and ICT skills which have helped to clarify their thinking and are sufficient to convey ideas to themselves and others effectively and precisely;</li> <li>provided evidence that they have considered and taken account of relevant issues, industrial practices and systems and control.</li> </ol>	<ol style="list-style-type: none"> <li>recorded and justified the need for any changes or adaptations;</li> <li>used appropriate materials, components, equipment and processes (including CAM) consistently correctly, skilfully and safely;</li> <li>made a complete product of high quality;</li> <li>demonstrated an ability to satisfy accurately and completely all the demands of the design solution;</li> <li>thoroughly considered QA &amp; QC and applied them consistently and successfully.</li> </ol>

**16.4 Quality of Written Communication**

An assessment for the quality of written communication shown in the completed design folder is to be made separately from the designing grade. Use the criteria given below and record the mark on the Candidate Record Form.

**Marks**

- 4-5 Information is clearly and logically presented using an appropriate form. The text is legible. Candidates spell, punctuate and use the rules of grammar accurately, enabling the meaning to be clearly understood.
- 2-3 Information is presented in an appropriate form. The text is legible. Candidates generally spell, punctuate and use the rules of grammar accurately, although there may be some errors. The meaning is clear.
- 1 Some of the information presented is in an appropriate form. Generally the text is legible. Although there are errors in spelling, punctuation and grammar, candidates' meaning can be understood.
- 0 Candidates have failed to reach the standard required for the award of a mark.

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**16.5 Evidence to Support the Award of Marks**

Teachers should keep records of their assessments during the course, in a form which facilitates the complete and accurate submission of the final assessments at the end of the course.

When the assessments are complete, the grades and/or marks awarded under each of the assessment criteria must be entered on the Candidate Record Form, with supporting information given in the spaces provided. A specimen Candidate Record Form appears in Appendix B; the exact design may be modified before the operational version is issued and the correct year's Candidate Record Forms should always be used.

## Supervision and Authentication

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- 17.1 Supervision of Candidates' Work** Candidates' work for assessment must be undertaken under conditions which allow the teacher to supervise the work and enable the work to be authenticated. If it is necessary for some assessed work to be done outside the centre, sufficient work must take place under direct supervision to allow the teacher to authenticate each candidate's whole work with confidence.
- 
- 17.2 Guidance by the Teacher** The work assessed must be solely that of the candidate concerned.
- The Coursework Project is, however, as much a vehicle for teaching as for assessment. It is therefore expected that the teacher will need to give advice and assistance to individual candidates as part of normal teaching. This should be provided, but normally in such a way that candidates have alternative possibilities to explore, and their own decisions to make about accepting or using the information or advice provided by the teacher. There may, of course, be occasions when direct teacher intervention is necessary to ensure safety, to prevent costly waste of materials or to provide a less able candidate with positive assistance.
- In any case where assistance given to an individual candidate goes beyond normal teaching, details must be recorded on the Candidate Record Form and taken into account in the assessment of coursework.
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- 17.3 Unfair Practice** At the start of the course, the supervising teacher is responsible for informing candidates of the AQA Regulations concerning malpractice. Candidates must not take part in any unfair practice in the preparation of coursework to be submitted for assessment, and must understand that to present material copied directly from books or other sources without acknowledgement will be regarded as deliberate deception. Centres must report suspected malpractice to AQA. The penalties for malpractice are set out in the AQA Regulations.
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- 17.4 Authentication of Candidates' Work** Both the candidate and the teacher are required to sign declarations confirming that the work submitted for assessment is the candidate's own. The teacher declares that the work was conducted under the specified conditions, and records details of any additional assistance.

## 18

## Standardisation

### 18.1 Standardising Meetings

Annual standardising meetings will usually be held in the autumn term. Centres entering candidates for the first time must send a representative to the meetings. Attendance is also mandatory in the following cases:

- where there has been a serious misinterpretation of the specification requirements;
- where the nature of coursework tasks set by a centre has been inappropriate;
- where a significant adjustment has been made to a centre's marks in the previous year's examination.

After the first year attendance is at the discretion of centres. At these meetings support will be provided for centres in the development of appropriate coursework tasks and assessment procedures.

### 18.2 Internal Standardisation of Marking

The centre is required to standardise the assessments across different teachers and teaching groups to ensure that all candidates at the centre have been judged against the same standards. If two or more teachers are involved in marking a component, one teacher must be designated as responsible for internal standardisation. Common pieces of work must be marked on a trial basis and differences between assessments discussed at a training session in which all teachers involved must participate. The teacher responsible for standardising the marking must ensure that the training includes the use of reference and archive materials such as work from a previous year or examples provided by AQA. The centre is required to send to the moderator the Centre Declaration Sheet, duly signed, to confirm that the marking of centre-assessed work at the centre has been standardised. If only one teacher has undertaken the marking, that person must sign this form.

A specimen Centre Declaration Sheet appears in Appendix B.



## Administrative Procedures

### 19.1 Recording Assessments

The candidates' work must be marked according to the assessment criteria set out in paragraphs 16.3 and 16.4. The marks and supporting information must be recorded in accordance with the instructions in paragraph 16.5. The completed Candidate Record Form for each candidate must be attached to the work and made available to AQA on request.

At the beginning of the course, centres are required to inform the AQA of the approximate number of candidates to be entered for the examination so that the appropriate number of Candidate Record Forms may be sent.

### 19.2 Submitting Marks and Sample Work for Moderation

The total component mark for each candidate must be submitted to AQA on the mark sheets provided or by Electronic Data Interchange (EDI) by the specified date. Centres will be informed which candidates' work is required in the samples to be submitted to the moderator.

### 19.3 Factors Affecting Individual Candidates

Teachers should be able to accommodate the occasional absence of candidates by ensuring that the opportunity is given for them to make up missed assessments.

Special consideration should be requested for candidates whose work has been affected by illness or other exceptional circumstances. Information about the procedure is issued separately.

If work is lost, AQA should be notified immediately of the date of the loss, how it occurred, and who was responsible for the loss. AQA will advise on the procedures to be followed in such cases.

Where special help which goes beyond normal learning support is given, AQA must be informed so that such help can be taken into account when assessment and moderation take place.

Candidates who move from one centre to another during the course sometimes present a problem for a scheme of internal assessment. Possible courses of action depend on the stage at which the move takes place. If the move occurs early in the course the new centre should take responsibility for assessment. If it occurs late in the course it may be possible to accept the assessments made at the previous centre. Centres should contact AQA at the earliest possible stage for advice about appropriate arrangements in individual cases.



**19.4 Retaining Evidence and  
Re-Using Marks**

The centre must retain the work of all candidates, with Candidate Record Form attached, under secure conditions, from the time it is assessed, to allow for the possibility of an enquiry upon results. The work may be returned to candidates after the issue of results provided that no enquiry upon result is to be made which will include re-moderation of the coursework component. If an enquiry upon result is to be made, the work must remain under secure conditions until requested by AQA.

Candidates repeating the examination may carry forward their moderated mark for the coursework component once only and within a twelve month period.

## Moderation

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### 20.1 Moderation Procedures

Moderation of the coursework is by inspection of a sample of candidates' work. This will initially involve design folders for the sample being sent by post from the centre to the moderator appointed by AQA. Moderators will visit new centres to assess the practical outcomes. They will also visit other centres as needs dictate. The centre marks must be submitted to AQA and the sample of design folders must reach the moderator by the specified date in the year in which the qualification is awarded.

Following the re-marking of the sample work, the moderator's marks are compared with the centre marks to determine whether any adjustment is needed in order to bring the centre's assessments into line with standards generally. In some cases it may be necessary for the moderator to call for the work of other candidates. In order to meet this possible request, centres must have available the coursework and Candidate Record Form of every candidate entered for the examination and be prepared to submit it on demand. Mark adjustments will normally preserve the centre's order of merit, but where major discrepancies are found, AQA reserves the right to alter the order of merit.

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### 20.2 Post-Moderation Procedures

On publication of the GCSE results, the centre is supplied with details of the final marks for the coursework component.

The candidates' work is returned to the centre after the examination with a report form from the moderator giving feedback to the centre on the appropriateness of the tasks set, the accuracy of the assessments made, and the reasons for any adjustments to the marks.

Some candidates' work may be retained by AQA for archive purposes.

## Awarding and Reporting

### 21

## Grading, Shelf-Life and Re-Sits

- |  |  |
|--|--|
| <p><b>21.1 Qualification Titles</b></p>                      | <p>The qualifications based on this specification have the following titles:<br/>AQA General Certificate of Secondary Education in Design and Technology (Graphic Products);<br/>AQA General Certificate of Secondary Education in Design and Technology (Graphic Products) Short Course.</p>  |
| <p><b>21.2 Grading System</b></p>                            | <p>Both the full course and short course qualifications will be graded on an 8 point grade Scale A*, A, B, C, D, E, F, G. Candidates who fail to reach the minimum standard for grade G will be recorded as U (unclassified) and will not receive a qualification certificate.</p> <p>Candidates must be entered for either the Foundation Tier or Higher Tier. For candidates entered for the Foundation Tier, grades C–G are available. For candidates entered for the Higher Tier A*–D are available. There is a safety net for candidates entered for the Higher Tier, where an allowed Grade E will be awarded where candidates just fail to achieve Grade D. Candidates who fail to achieve a Grade E on the Higher Tier or Grade G on the Foundation Tier will be reported as unclassified.</p> |
| <p><b>21.3 Re-Sits</b></p>                                   | <p>Individual components may not be retaken, but candidates may retake the whole qualification more than once.</p>   |
| <p><b>21.4 Minimum Requirements</b></p>                      | <p>Candidates will be graded on the basis of work submitted for assessment.</p>  |
| <p><b>21.5 Carrying Forward of Centre-Assessed Marks</b></p> | <p>Candidates re-taking the examination may carry forward their moderated coursework marks. These marks have a shelf-life which is limited only by the shelf-life of the specification, and they may be carried forward an unlimited number of times within this shelf-life.</p>   |
| <p><b>21.6 Awarding and Reporting</b></p>                    | <p>The regulatory authorities, in consultation with GCSE awarding bodies, developed a Code of Practice for GCSE qualifications which were introduced in September 2000. This specification complies with the grading, awarding and certification requirements of the current GCSE, GCE, GNVQ and AEA Code of Practice April 2007 and will be revised in the light of any subsequent changes for future years.</p>  |

## Appendices

### A

## Grade Descriptions

The following grade descriptors indicate the level of attainment characteristic of the given grade at GCSE. They give a general indication of the required learning outcomes at each specific grade. The descriptors should be interpreted in relation to the content outlined in the specification; they are not designed to define that content.

The grade awarded will depend in practice upon the extent to which the candidate has met the assessment objectives (as in section 6) overall. Shortcomings in some aspects of the examination may be balanced by better performances in others.

**Grade F** When designing and making products, and acquiring and applying knowledge, skills and understanding, candidates draw on and use various sources of information. They clarify their ideas through discussion, drawing and modelling; use their understanding of the characteristics of familiar products when developing and communicating their own ideas and work from their own plans, modifying them where appropriate.

Candidates work with a range of tools, materials, equipment, components and processes with some precision; check their work as it develops and modify their approach in the light of progress; test and evaluate their products, showing that they understand the situations in which their designs will have to function and are aware of resources as a constraint and evaluate their use of basic information sources.

**Grade C** When designing and making products, and acquiring and applying knowledge, skills and understanding, candidates use a wide range of appropriate sources of information and strategies to develop ideas, responding to information they have identified. They investigate form, function and production processes and communicate ideas, using appropriate media.

Candidates recognise the needs of users and develop realistic designs. They produce plans that make use of time and resources to carry out the main stages of making products. They work with a range of tools, materials, equipment, components and processes, taking account of their characteristics, and organise their work so that they can carry out processes accurately and consistently, and use tools, equipment, materials and components with precision.

Candidates adapt their methods of manufacture to changing circumstances, providing a sound explanation for any change from the initial specification. They select appropriate techniques to test and evaluate how their products would perform when used and modify their products in the light of ongoing evaluation to improve their performance. They evaluate their use of information sources.

**Grade A** When designing and making products, and acquiring and applying knowledge, skills and understanding, candidates seek out and use information to help their detailed design thinking, and recognise the needs of a variety of client groups. They are discriminating in their selection and use of information sources to support their work and they use a wide range of strategies to develop appropriate ideas, responding to information they have identified.

Candidates investigate form, function and production processes and communicate ideas using a variety of appropriate media. They recognise the different needs of a range of users when developing fully realistic designs. When planning, they make sound decisions on materials and techniques based on their understanding of the physical properties and working characteristics of materials. They work from formal plans that make the best use of time and resources; work with a range of tools, equipment, materials and components to a high degree of precision and make products that are reliable and robust and that fully meet the quality requirements given in the design proposal.

Candidates identify conflicting demands on their design, explain how their ideas address these demands and use this analysis to produce proposals. They identify a broad range of criteria for evaluating and testing their products, clearly relating their findings to the purpose for which the products were designed and the appropriate use of resources, and fully evaluate their use of information sources.

## B

# Record Forms

Candidate Record Forms are available on the AQA website in the Administration area. They can be accessed via the following link [http://www.aqa.org.uk/admin/p\\_course.php](http://www.aqa.org.uk/admin/p_course.php)

C

## Overlaps with other Qualifications

Some overlaps exist between this and other Design and Technology specifications. The overlap is primarily in the design process and the scheme of assessment. As all specifications conform to the GCSE Design and Technology Subject Criteria, there are also overlaps of broad content, e.g. ICT, health and safety, systems and control, industrial and commercial practice but each is dealt with in the context of the focus areas embodied in the specification title.

Overlaps can also occur with many of the AQA Foundation and Intermediate GNVQ Manufacturing Units, which offer opportunities to focus on a variety of industries, as well as Engineering Units and to a lesser extent Construction Units. For example, all three include units on working with others, health and safety, the application of computers and new technologies and, for Engineering and Manufacturing, units involving the designing and making of products.

D

# Project Assessment Matrix

DESIGN & TECHNOLOGY PROJECT ASSESSMENT MATRIX

DESIGNING SKILLS

	A			B			C			D			E			F			G			U																																																	
	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L																																															
A	90	89	88	86	85	84	82	81	80	78	77	76	74	73	72	70	69	68	66	65	64	62	61	60	58	57	56	54	53	52	50	49	48	46	45	44	42	41	40	38	37	36	34	33	32	30	29	28	26	25	24	22	21	20	18	17	16	14	13	12	11	10	9	8	6	5	4	3	2	1	0
B	88	87	86	84	83	82	80	79	78	76	75	74	72	71	70	68	67	66	64	63	62	60	59	58	56	55	54	52	51	50	48	47	46	44	43	42	40	39	38	36	35	34	32	31	30	28	27	26	24	23	22	20	19	18	16	15	14	12	11	10	9	8	6	5	4	3	2	1	0		
C	86	85	84	82	81	80	78	77	76	74	73	72	70	69	68	66	65	64	62	61	60	58	57	56	54	53	52	50	49	48	46	45	44	42	41	40	38	37	36	34	33	32	30	29	28	26	25	24	22	21	20	18	17	16	14	13	12	11	10	9	8	6	5	4	3	2	1	0			
D	82	81	80	78	77	76	74	73	72	70	69	68	66	65	64	62	61	60	58	57	56	54	53	52	50	49	48	46	45	44	42	41	40	38	37	36	34	33	32	30	29	28	26	25	24	22	21	20	18	17	16	14	13	12	11	10	9	8	6	5	4	3	2	1	0						
E	80	79	78	76	75	74	72	71	70	68	67	66	64	63	62	60	59	58	56	55	54	52	51	50	48	47	46	44	43	42	40	39	38	36	35	34	32	31	30	28	27	26	24	23	22	20	19	18	16	15	14	12	11	10	9	8	6	5	4	3	2	1	0								
F	78	77	76	74	73	72	70	69	68	66	65	64	62	61	60	58	57	56	54	53	52	50	49	48	46	45	44	42	41	40	38	37	36	34	33	32	30	29	28	26	25	24	22	21	20	18	17	16	14	13	12	11	10	9	8	6	5	4	3	2	1	0									
G	74	73	72	70	69	68	66	65	64	62	61	60	58	57	56	54	53	52	50	49	48	46	45	44	42	41	40	38	37	36	34	33	32	30	29	28	26	25	24	22	21	20	18	17	16	14	13	12	11	10	9	8	6	5	4	3	2	1	0												
U	72	71	70	68	67	66	64	63	62	60	59	58	56	55	54	52	51	50	48	47	46	44	43	42	40	39	38	36	35	34	32	31	30	28	27	26	24	23	22	20	19	18	16	15	14	12	11	10	9	8	6	5	4	3	2	1	0														
M	70	69	68	66	65	64	62	61	60	58	57	56	54	53	52	50	49	48	46	45	44	42	41	40	38	37	36	34	33	32	30	29	28	26	25	24	22	21	20	18	17	16	14	13	12	11	10	9	8	6	5	4	3	2	1	0															
A	66	65	64	62	61	60	58	57	56	54	53	52	50	49	48	46	45	44	42	41	40	38	37	36	34	33	32	30	29	28	26	25	24	22	21	20	18	17	16	14	13	12	11	10	9	8	6	5	4	3	2	1	0																		
K	64	63	62	60	59	58	56	55	54	52	51	50	48	47	46	44	43	42	40	39	38	36	35	34	32	31	30	28	27	26	24	23	22	20	19	18	16	15	14	12	11	10	9	8	6	5	4	3	2	1	0																				
I	62	61	60	58	57	56	54	53	52	50	49	48	46	45	44	42	41	40	38	37	36	34	33	32	30	29	28	26	25	24	22	21	20	18	17	16	14	13	12	11	10	9	8	6	5	4	3	2	1	0																					
N	58	57	56	54	53	52	50	49	48	46	45	44	42	41	40	38	37	36	34	33	32	30	29	28	26	25	24	22	21	20	18	17	16	14	13	12	11	10	9	8	6	5	4	3	2	1	0																								
G	56	55	54	52	51	50	48	47	46	44	43	42	40	39	38	36	35	34	32	31	30	28	27	26	24	23	22	20	19	18	16	15	14	12	11	10	9	8	6	5	4	3	2	1	0																										
S	54	53	52	50	49	48	46	45	44	42	41	40	38	37	36	34	33	32	30	29	28	26	25	24	22	21	20	18	17	16	14	13	12	11	10	9	8	6	5	4	3	2	1	0																											
L	50	49	48	46	45	44	42	41	40	38	37	36	34	33	32	30	29	28	26	25	24	22	21	20	18	17	16	14	13	12	11	10	9	8	6	5	4	3	2	1	0																														
L	48	47	46	44	43	42	40	39	38	36	35	34	32	31	30	28	27	26	24	23	22	20	19	18	16	15	14	12	11	10	9	8	6	5	4	3	2	1	0																																
S	46	45	44	42	41	40	38	37	36	34	33	32	30	29	28	26	25	24	22	21	20	18	17	16	14	13	12	11	10	9	8	6	5	4	3	2	1	0																																	
L	42	41	40	38	37	36	34	33	32	30	29	28	26	25	24	22	21	20	18	17	16	14	13	12	11	10	9	8	6	5	4	3	2	1	0																																				
L	40	39	38	36	35	34	32	31	30	28	27	26	24	23	22	20	19	18	16	15	14	12	11	10	9	8	6	5	4	3	2	1	0																																						
L	38	37	36	34	33	32	30	29	28	26	25	24	22	21	20	18	17	16	14	13	12	11	10	9	8	6	5	4	3	2	1	0																																							
L	34	33	32	30	29	28	26	25	24	22	21	20	18	17	16	14	13	12	11	10	9	8	6	5	4	3	2	1	0																																										
L	32	31	30	28	27	26	24	23	22	20	19	18	16	15	14	12	11	10	9	8	6	5	4	3	2	1	0																																												
L	30	29	28	26	25	24	22	21	20	18	17	16	14	13	12	11	10	9	8	6	5	4	3	2	1	0																																													

M A K I N G S K I L L S