Revision Pack for: GCSE Graphic Products

Exam Board: AQA


Examination Format:

Unit 1: Written Paper (45501)

40% of total marks

2 hours

120 marks

Candidates answer all questions in two sections

Pre-Release material issued: Will be place on Campus Website on release.

Assessment Objectives:

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In GCSE specifications which require you produce written material in English, you must:

• ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear

• select and use a form and style of writing appropriate to purpose and to complex subject matter

• organise information clearly and coherently, using specialist vocabulary when appropriate. In this specification QWC will be assessed in the Controlled Assessment and in the written paper.

The controlled assessment criteria give further information on marks to be awarded in respect of QWC.

What to Revise

http://www.aqa.org.uk/subjects/design-and-technology/gcse/design-and-technology-graphic-products-4550/subject-content/unit-1
Materials and Components

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:

- understand paper sizes A0 to A6 and their relationship to each other;
- know the units by which the thickness of paper, and board are measured;
- recognise the working characteristics of paper, board and other graphic materials;
- understand the properties and uses of different types of new (virgin), recycled and re-useable paper and board both as a media for communication and as a material for manufacturing products such as packaging; i.e. cartridge, layout, bleed proof, tracing, card, corrugated board, mount board, duplex, solid white board and grey board;
- understand that many paper based boards are laminated to other materials and that the composite can be adjusted to create different properties for specific purposes; understand the properties and uses of thermoplastics; i.e. HIPS. PVC, Polypropylene (PP) and acetate;
- understand the properties of sheet and block modelling materials and their uses; i.e. Foam core board, corrugated plastic sheet and expanded polystyrene (Styrofoam) and machining foams;
- understand the use of spiral wound tubes;
- make judgements about cost, flexibility, finish, rigidity, strength, quality, weight, environmental and sustainable issues;
- know how to apply a quality finish to modelling materials including fillers and finishing with acrylic and water based paints;
- know the functions, uses and applications of ‘smart’/modern materials; i.e. Precious Metal Clays (PMC) used in jewellery manufacture, corn starch polymers, paper foam and potatopak used in packaging and thermochromic pigments used for thermal warning patches.
- be able to use a full range of graphic equipment to develop hand-generated images;
- use a range of appropriate adhesives for different materials; i.e. PVA, epoxy resins, spray glues/hot glue, cements, tape and adhesive plastic film;
- use a range of hand and powered cutting and forming tools safely; i.e. scalpels and craft knives with mats, scissors, rotary cutters, compass cutters, fret saw, die cutter and creasing bars;
- use ‘bought-in’ components where appropriate. i.e. fasten, seal, hang, join, bind, index;
- understand how graphic materials can be linked with other components and materials to produce a product designed for a specific purpose.

Design and Market Influences

Candidates should develop an understanding of the broad perspectives of the designed world. Candidates should understand the role designers play in Graphic Products. This will include recognizing a need, designing and creating solutions through effective communication of ideas and the means of evaluating the outcome.

Designers

Candidates should:

- recognise that designers are influencing new graphic products;
- recognise the style of the work of the following designers:
  - Harry Beck;
Techniques and Processes
Candidates should:
• be able to communicate a concept to a potential client, manufacturer or purchaser;
• know the functions of mock-ups, models and prototypes and the importance they can play in the design process; know how ‘target marketing’ and ‘gap in the market’ identification are used to promote a product.

Sketching
Candidates should:
• produce quality, annotated 2D and 3D freehand drawings;
• use crating/wire frame techniques to produce drawings; use grids and under-lays.

Enhancement
Candidates should:
• use pencils, pens and colour to add visual impact to designs and accentuate shape and form;
• use textural representation to convey different materials and surfaces;
• demonstrate an understanding of contrast, complementary, hue and tone;
• apply the language of colour;
• be aware of colour fusion and separation and its commercial application.

Presentation
Candidates should:
• demonstrate a knowledge of computer graphic manipulation;
• generate and select suitable lettering;
• have a knowledge of encapsulation;
• use presentation drawings conceptualise the final design;
• use ICT to promote the final design to the client.

Pictorial drawings
Candidates should:
• produce one point and two point perspective sketches;
• produce isometric sketches.

Working drawings
Candidates should:
• use third angle orthographic projection to British Standard Conventions (BS8888, 2006);
• demonstrate use of self assembly, sectional and exploded drawings;
• use and understand scale drawings;
• interpret room, site plans and maps;

Surface development (net)
Candidates should:
- understand how 3D containers are manufactured from sheet material and be able to draw a net;
- demonstrate a knowledge of CAD/CAM to produce and manipulate surface development.

Information drawings
Candidates should:
- represent data in graphical form; i.e. 2D and 3D bar and pie charts, line graphs and pictographs;
- understand the language of labels and signage;
- understand the function and uses of corporate identity;
- produce ideograms, pictograms and symbols;
- produce flowcharts with feedback loops;
- produce sequential illustrations;
- produce schematic maps.

Paper and card Engineering
Candidates should understand the construction and accuracy of this work.

Products and applications
Candidates should:
- distinguish between quality of design and quality of manufacture;
- have an understanding of product life-cycle including design introduction, evolution, growth, maturity, decline and replacement;
- understand the needs and wants of customers;
- use criteria to judge the quality of a graphic product i.e. meeting a need, fitness of purpose, appropriate use of materials and time.

Evaluation techniques
Candidates should:
- know why evaluation is important and its contribution to designing an on-going product improvement;
- identify the role end-users and others play in evaluation;
- identify ways in which a product can be tested or evaluated;
- test the outcomes against the original specification;
- produce a summative evaluation of their final outcome against their original specification.

Social, Cultural, Moral, Environmental, Economic and Sustainability Issues
Candidates should:
- recognise that graphical images and products should not offend minority groups;
- consider moral and cultural implications of graphic products;
- consider ergonomics and use of anthropometric data when designing products;
- understand symbols and signs which are essential information on packaging.

Economic
Candidates should:
- understand the materials and social costs of packaging;
- have an awareness of planned obsolescence.
Sustainability
Candidates should:
- be aware of the 6 Rs rules – repair, reduce, recycle, re-use, re-think, refuse;
- consider environmental issues related to graphic products;
- understand the reasons for and consequences of, the increased and reduced use of product packaging;
- be aware of the advantages and disadvantages of re-cycling and re-using materials.

Information and Communication Technology
Candidates should:
- identify the component parts of a CAD/CAM system;
- recognise different CAD/CAM and ICT input and output devices and their function;
- select and use appropriate CAD software;
- select and use appropriate ICT and graphic software;
- know the benefits and costs of CAD/CAM and ICT;
- produce virtual reality models using CAD software;
- know that the electronic transfer of data permits designing and manufacturing activities to take place in different geographic locations;
- use photographic evidence;
- use photographic evidence from any source including digital or video record any stages during Design and Manufacture and promotion.

Health and safety issues
Candidates should:
- be aware of information regarding the safe handling of tools, materials, components and equipment;
- recognise hazards, understand risk assessment 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;
- manage their environment to ensure the health and safety of themselves and others.

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 an understanding of the commercial manufacture of graphic products and the increasing role of CAD/CAM at all levels.

Systems and control procedures
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 manufacturing system and show feedback;
- recognise the quality control marks and symbols used in the printing industry i.e. registration marks, colour bar and crop marks;
- understand the principles of simple mechanisms and identify the relevant components and features i.e. levers, linkages, audio/visual programmable ICs.
Industrial Practices

Candidates should:

- understand how the method of production changes from single to multiple production;
- demonstrate a sequence of making tasks that show how and when decisions are made;
- understand the importance of producing scale models and prototypes in product development;
- understand the different demands of different scales of production;
- have an awareness of ‘just in time production’ (JIT);
- understand how common graphical products are designed and manufactured;
- understand how and why quality checks are made in production;
- demonstrate an awareness of commercial printing and packaging methods; i.e. lithography, flexography, gravure, screen printing and digital printing;
- match production method to best printing methods for a range of graphic products;
- know the four processing colours and understand special colours are also used;
- understand print finishes used in printing, varnishing, laminating, embossing and foil application;
- know how multiple surface developments (nets) are produced by the use of die cutting;
- identify devices used to form shapes, position features and aid repetition;
- demonstrate the reduction of waste and show economical use of materials;
- understand the function and need for packaging: protection, need in transportation, storage, security, display, giving consumer information.
- have a knowledge and understanding that design ideas are protected in law through copyright, patents and registered designs.

How to Revise

Read and Memorise.

- Summary notes - short version of main notes.
- List of keywords for each topic covered, which can act as "triggers" for other ideas.
- Some kind of diagrammatic representation of notes can be helpful.
- Revise with a friend - if possible, exchange ideas during revision - this can be very helpful to both people in understanding topics and building confidence.
- Questions and Answers - get a friend to ask you specific questions about topics and think up questions to ask your friend. This will test and help to build your own understanding.
- Make up a set of revision cards - with one main topic per card, each topic listing ideas or information for this topic. You can carry these cards with you and, if you choose, get them out and revise whilst a passenger in a car or on the bus or train, or when queuing somewhere.

Examination Strategies:

- They will be developed during revision session through exam practical and walk through papers.
- Leave the first question relating to the design and pre-release paper until last.
- Answer the questions that you feel most confident with first.
Guidance on times spent on each questions are given.

Keep to the timings so that you can maximise your potential marks by completing all questions in full.

**Command Words**

**Annotate** Add brief notes/reasons, to explain ideas, to an illustration – Remember that you must be critical/analytical in order to access the top range of marks.

**Calculate** Implies that a numerical answer is needed.

**Complete** Enter an answer in the space provided.

**Describe** State in words the important points of the topic.

**Dimension** Add measurements to a drawing

**Draw** Use a straight edge, pencil, fine-liner (Set square etc) to help produce a Drawing e.g. Orthographic.

**Explain** Write an explanation of a topic/point that includes justification of the answer i.e. Why / How / Because etc.

**Discuss** Develop/debate an argument to justify your answer/point of view etc.

**Evaluate** Assess/appraise once work against a criteria etc.

**Free Hand** Using a pencil, fine liner and your hand to produce an illustration or sketch without the use of rulers and drawing instruments etc.

**Give a reason** How / Why – a reason which applies knowledge of this subject e.g. Expanded Polystyrene is used for packaging because …..

**Sketch** Informal ‘freehand’ drawings to illustrate an idea / design or point, without the use of rulers and drawing instruments.

**Label** Identify parts of a product / drawing etc. e.g. leader lines, key etc

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**Technical Terms - Drawing Types**

**Isometric Projection**
- 3 Dimensional Drawing / sketching / pictorial drawing.

**Single Point Perspective**
- Pictorial Drawing / sketching that uses one Vanishing point.

**Two Point Perspective**
Pictorial Drawing / sketching that uses two Vanishing points.

**Third Angle Orthographic Projection / Drawing**
2 Dimensional drawing used to produce a Working Drawing – The most accurate type of drawing used in Technology.
It is used to communicate ideas internationally.
A Working Drawing is used by manufacturers / craftsmen etc. to work from in order to produce a Product e.g. A Package, Piece of Furniture etc.

**NB:** There is no Oblique Projection in this Specification so do not use it.

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**GLOSSARY OF GENERAL TERMS**

**Aesthetics** – How various features combine to make something ‘beautiful’ or ‘attractive’.

**Aims** – The broad educational or vocational purposes of a qualification.

**Analyse** – To reduce to basic elements – a term often used in the early stages of the designing process.

**Annotation** – The addition of explanatory notes.

**Anthropometrics** – The study of the measurements and movement of human beings.

**Artefact** – A product that has been designed and made.
Assessment Objectives – The criteria used to evaluate candidates attainments.

Batch Production – The limited production of a number of identical artefacts.

Blow Moulding – A common industrial plastic moulding process used for products such as bottles and barrels.

Brief – A clear statement of the Design objective / Design task.

BSI – British Standards Institution – the organisation responsible for preparing codes of practice. BS8888:2006

CAD – Computer aided design.

CAM – Computer aided manufacture.

CIM – (also called CAD/CAM) – an integrated system of design and manufacture using computers.

Candidate Record Form – The sheet used for the assessment of individual candidate’s coursework and the declaration by both candidate and teacher(s) of the help, over and above that normally expected from teachers, given in the production of the coursework. Client – An individual or company that employs the services of any professional person, e.g. designers.

Colour Registration – The alignment of different colours used in the creation of a printed item or artefact.

Colour Wheel – This relates to the relationship between primary, secondary and tertiary colours, complementary colours and the principles of how colour can be used in products and design situations.

Compliant – A material that can be easily shaped, folded, cut or joined.

CNC – Computer numerical control.

Constraints – Limits placed on the designing process.

Consumer – A person who purchases or uses a product or service.

Corporate Identity – The ‘whole’ graphic image of a business or organisation – the logo type, uniform, colour and product(s) image.

Coursework – Tasks set and undertaken during the course which are integral to the course of study.

Crease – Folding card or paper over a straight edge in a straight line.

Critical Control Points – Stages in the production process that are regularly checked to ensure errors and risks are reduced to an acceptable level.

Criteria – Working characteristics that a product or process must achieve.

Data – Relevant facts and figures collected by research or experimentation and testing.

Database – A collection of information now commonly stored on computer.

Design – The process of solving problems through the development of ideas to produce a solution within set constraints.

Development – (1) The refinement of ideas to produce a final solution, dealing with the details of materials/ingredients, construction/method of manufacture, appearance/aesthetics and function including quantities and sizes.

Development – (2) The flat form of the surface area of a container (sometimes known as a net).

Die Cutting – This is a machine process, where shaped designs are cut out in batches or in single units. Creasing may also take place at this stage.

Economics of Scale – The reduction in unit costs as more are produced.

Embossing – This is the activity of distorting the material, generally paper and card by the application of pressure. Embossing may be simulated by using specialist embossing powders, used in conjunction with special pens or rubber stamps.

Entry Codes – The codes to be used when entering candidates for each unit and each qualification.

Ergonomics – The study of human interaction with the environment.

Evaluation – Judgements made throughout the designing process which test the outcome against the specification.
**External Assessment** – A form of independent assessment in which an awarding body sets or defines assignments, tests or examinations, specifies the conditions under which they are to be taken (including details of supervision and duration), and assesses candidates responses. (See also Internal Assessment).

**Fixed Costs** – The costs that a company has to expend regardless of output.

**Fold** – Bend board over on itself without the use of instruments / straight edge etc.

**Formal Elements** – The part of aesthetics that relates to the elements of visual appeal – colour, form, shape, symmetry, balance, line, rhythm, composition and proportion.

**Flowchart** – A diagrammatic representation of a process which includes decision making and feedback.

**Function** – What an artefact or process is expected to do.

**Generic** – Of the same group or family.

**Ideogram** – This is a logo that symbolises an idea by representing an object or objects.

**Injection Moulding** – The injection of a molten material into a mould under pressure.

**Internal Assessment** – A form of assessment that does not meet the definition of external assessment for a general or vocational qualification. Such assessments are made by the centre and moderated by the awarding body.

**Internal Standardisation** – The requirement for centres to standardise assessment across different teachers and teaching groups to ensure that all candidates at each centre have been judged against the same standards.

**Jigs** – Devices for holding parts in the appropriate position for machining or assembling.

**Just in Time** – This is a system used to plan the sequences and requirements of each stage involved in the manufacture of a product.

**Key Skills** – Key Skills are those generic skills that can enable people to perform well in education, training and life in general. They can help people to become members of a flexible workforce and equip them with the means to benefit from life-long learning.

**Logo** – A symbol associated with the identity of a company or organisation.

**Marketing** – The selling of a product or service to the consumer.

**Mass Production** – The production of an artefact in very large numbers.

**Mechanism** - (Mechanical Movement) A mechanism creates movement within a product e.g. a pop up card, push pull linkage to create movement etc.

**Mind Mapping** – A rapid collection of initial thoughts regarding a problem.

**Mock-up** – A model (often full-size) of a design to allow evaluation.

**Model** – A representation that can be either 2D or 3D, to a scale and made from easily manipulated materials.

**Moderation** – The process through which internal assessment is monitored by an awarding body to ensure that internal assessment is valid, reliable, fair and consistent with required standards.

**Overheads** – Costs not directly related to the manufacture of a product.

**Preparation Sheet** – The sheet issued to centres prior to the examination which contains details of topics that will be covered in the examination paper.

**Primary Research** – Research done by an individual from original sources.

**Production Planning** – The process of detailing the steps that need to be carried out before a product is manufactured that takes account of both time constraints and available resources.

**Profit** – The difference between the cost of production, including overheads, and the selling price.

**Prototype** – The initial version of a product used for testing, development and evaluation.

**Quality Assurance** – Preparatory work and techniques carried out during the design process to ensure the process will perform to specification.

**Quality Control** – Operational checks and tests carried out to ensure that the product performs to
specification.

**Questionnaire** – A series of questions aimed at obtaining information on a specific situation. The analysis of the results is a key feature of this activity, time needs to be spent creating the actual questions.

**Render** - To add colour, shading, textures, shadows, wood-graining, plastic effects etc. to a drawing or sketch.

**Research** – The gathering of relevant information.

**Retail** – The merchandising of products.

**Resources** – The equipment, materials, knowledge and skills required to design and make a product.

**Risk Assessment** – The process of judging the likelihood of a problem occurring – using a high, medium and low scale.

**Risk Control** – The steps taken to stop an assessed risk occurring.

**Score** - Indent a line in board or paper etc. to help fold the material accurately. This is usually done with a modelling knife, paper scorer, used ball point pen or hard pencil.

**Secondary Research** – Research drawn from existing sources such as books and magazines.

**Smart Materials** - These are modern materials that respond to differences in temperature or light and then change in some way. Some also have a memory and they revert back to their original state – e.g. colour changing dyes.

**Solution** – The means by which the need is satisfied.

**Specification** – (1) The criteria that a solution must achieve. (2) Specification also means the complete description of the subject content, assessment arrangements and performance requirements for a qualification. This now replaces the word ‘syllabus’.

**Spider Diagram** – A means of presenting the results of research and analysis.

**Surface Development (Net)** – Unfolding a package or box creates a Surface Development of the product.

**Survey** – Research carried out by questioning a number of different people or organisations.

**Symbol** – A design idea that can be abstract or realistically represent a solution.

**System** – A group of processes organised to perform a task.

**Template** – A pattern or gauge used as a guide for marking/cutting out single or batches of a selected design idea.

**Tessellation** – Nets/Developments arranged in a pattern or system. 2D shapes that can be fitted together, with little space or waste – this technique is often used when arranging developments for printing.

**Testing** – Checking the outcome in relation to the original specification and brief.

**Tolerance** – The range/allowance permitted when manufacturing a product.

**Typography** - The construction / layout of neat lettering / typestyles.

**Unit Cost** – The cost of producing a single item, found by dividing the total cost by the number of units produced.

**User Trip** – The recording of a user’s impressions based upon the function of a product – This is an example of a ‘First Hand Research Technique’.

**Varnishing** – This is the application of a thin glossy varnish that is applied to a printed product. It has a number of functions – it can help to protect the printed product, it makes it more attractive and can also be used to create dramatic highlights. There are various types of varnish used for different applications.

**Vacuum Forming** – The process of shaping thermoplastics onto a former by the application of heat and a vacuum.
Model response with annotations.
Stantonbury Google drive has references to model responses to the various types of questions.

RESOURCES:
Amazon.co.uk – GCSE Design & Technology Graphic Products AQA REVISION GUIDE by
Richard Parsons CGP (blue cover) £4.49

USEFUL WEBSITES:
www.aqa.or.uk
www.bbc.co.uk/schools/gcsebitesize/
www.Technologystudent.com
www.mr-dt.com

Apps:
Design & technology by J Plimmer is a good app and can be downloaded for Apple and Andriod for 79p.
Plastic Guide by Bruder Consulting AB (Free to download for Apple and Andriod)
IDT HD by Ray Gentleman (Free to download for Apple and Andriod)
ID Cards - Loughborough Design School By Loughborough University (Free to download for Apple and Andriod)