

HELP - Resources you could use

- Past Papers - This is a new course and so there are no past papers. However if you look on Technology Student (See link below) there are some practice questions for you to use. [AQA Formulae and Equations](#)
- Answer the set questions in the [question booklet](#). These are focused questions from the old exam but may help prepare for some questions on the new paper. The question titles are shown in **Purple**.
- Use the links (in Blue and Underlined) on this document eg [Technology Student](#) which has a special area dedicated to the new [AQA DT GCSE Course](#). Technology Student.Com is an excellent free online resource with animations and information such as flip cards that can be printed out. [Technology Student Revision Exercises](#).
- Focus education is excellent for information on Mechanisms, Energy, Materials and Manufacturing. Excellent multiple choice testing section.This available for free online to students using this link - [Focus Resources](#)
 - Smart, Modern and Composite Materials**
 - Focus on Mechanisms**
 - Focus on Plastics Manufacturing Processes**
 - Energy use and Environment**
- The school has recommended the **CGP Revision book 'GCSE AQA Design and Technology (9-1 Course)'** - The topics shown in **RED** in the section below refer to the headings in this revision book.

We recommend that you use the CGP revision book (available from the school shop or bookshops eg Amazon). GCSE AQA Design and Technology (9-1 Course) ISBN 978-1-78294-752-3 There are other books published by CGP that support this course on their web site at [www.cgpbooks.co.uk](#) We also recomend [SENECA](#) - AQA Design and Technology which links to the same headings as used below.

The Written Paper

A 2 hour paper split into 3 sections.

- Section A (20 Marks) - Core Technical Principles
- Section B (30 Marks) - Specialist Technical Principles
- Section C (50 Marks) - Designing and Making Principles

AYou will be given a mixture of **Multiple Choice** (1 Mark), **Short Answer** (between 3 and 8 Marks) including questions that require **analysing** and **evaluating**, and **Extended Answer** (8 Marks) Questions. **Maths questions** can occur in all sections.

The following are command words

- 'Evaluate'** means that you have to make a *judgement from available evidence*.
- 'Discuss'** means you should *present key points*.
- 'State'** means that you should answer in *clear terms* - you do not need to explain.
- 'Illustrate'** means that you need to present *examples*.
- 'Explain'** means that you need to set out *reasons*.

Section A (20 Marks) - Core Technical Principles

This section covers the basic information you need across a wide range of materials and technologies. You should **understand all of this content** though you will not be expected to have an in depth knowledge - that is for the next section. Some of this content you will have covered at KS3.

If you are using the **CGP revision book** to revise then focus on [Section One - Key Ideas in Design and Technology](#) and [Section Two - An introduction to Materials and Systems](#)

WHEN TO REVISE Date	WHAT TO REVISE Key topics for revision	HOW TO REVISE Subjects to help you get started using CGP revision book	Links to Technology Student.Com	What I should know?
Week 7 Mon 18 March 2019	1.1 New and Emerging technologies	<ul style="list-style-type: none"> p4 - Technology in Manufacturing p5 - Production Systems - CAD/CAM p7 - Product Sustainability p9 - Product Sustainability and Social Issues p11 - Products in Society 	NEW AND EMERGING TECHNOLOGIES - Look near the top of the page on industry, enterprise, sustainability, people, culture, society environment and production techniques and systems. Revision cards for Environment about ¾ way down the page. Revision web at the bottom of the page.	<ul style="list-style-type: none"> the design and organisation of the workplace including automation and the use of robotics buildings and the place of work tools and equipment. crowdfunding, virtual marketing, fair trade and retail co-operatives automation, computer aided design (CAD), computer aided manufacture (CAM), flexible manufacturing systems (FMS) and just in time (JIT) ethics, design for disabled and elderly and different religious groups continuous improvement efficient working the environment, finite and non–finite energy, disposal of waste - pollution, global warming and lean manufacturing. planned obsolescence and design for maintenance
	1.2 Energy Generation and Storage	<ul style="list-style-type: none"> p13 - Powering Systems 	ENERGY GENERATION AND STORAGE - Look about ¼ of the way down the page for sections on Energy generation and storage including fossil fuels, nuclear and batteries.	<ul style="list-style-type: none"> coal, gas, oil wind, solar, tidal, hydro-electrical, biomass

			Revision cards for Energy near bottom of page. Revision web at the bottom of the page.	
	1.3 Developments in new materials	<ul style="list-style-type: none"> • p30 -Developments in New Materials 	DEVELOPMENTS IN NEW MATERIALS Look about ¼ of the way down the page for sections on Modern materials, Smart Materials and Composite Materials	<ul style="list-style-type: none"> • Modern Materials - eg Graphene, Metal foams and Titanium. • Smart Materials - eg shape memory alloys, thermochromic pigments and photochromic pigments • Composite Materials eg glass reinforced plastic (GRP) and carbon fibre reinforced plastic (CRP). • Technical Textiles - eg conductive fabrics, fire resistant fabrics, kevlar and microfibres incorporating micro encapsulation.
Week 6 Mon 25 March 2019	1.4 Systems approach to designing	<ul style="list-style-type: none"> • p24 - Electronic systems 	SYSTEMS APPROACH - Electronic systems including programmable components to provide functionality to products and processes, and enhance and customise their operation	<ul style="list-style-type: none"> • Inputs - The use of light sensors, temperature sensors, pressure sensors and switches. • Processes - The use of programming microcontrollers as counters, timers and for decision making, to provide functionality to products and processes. • Outputs- The use of buzzers, speakers and lamps, to provide functionality to products and processes.
	1.5 Mechanical Devices	<ul style="list-style-type: none"> • p27 - Mechanical Systems • Focus Resources Go to Mechanisms. Excellent multiple choice section. See also mechanical toys. 	MECHANICAL SYSTEMS Look about ⅓ of the way down the page for further links eg types of motion, forces, levers, cams etc	<ul style="list-style-type: none"> • Levers - first order, second order and third order • Linkages - bell cranks, push/pull. • Rotary systems - pulleys and belts. simple gear trains, CAMs and followers
	1.6 Materials and their working properties	<ul style="list-style-type: none"> • p15 - Properties of Materials • p16 - Paper, Board and Timber • p18 - Metal's Alloys and polymers • p20 -Textiles • p22- Textiles and Manufactured boards 	Materials - Wood, Metals, Plastics and Composites Materials - Papers and Boards about ½ way down the page. Materials - Natural and Manufactured Timbers about ½ way down the page. Materials - Metals about ½ way down the page. Materials - Polymers about ½ way down the page. Materials - Textiles about ½ way down the page. Poster - Paper and Boards Revision cards for Materials about ⅓ way down the page. Revision web at the bottom of the page.	Describe the different materials using the terms below: <ul style="list-style-type: none"> • absorbency (resistance to moisture) • density • fusibility • electrical and thermal conductivity. • strength • hardness • toughness • malleability • ductility and elasticity. <ul style="list-style-type: none"> • Papers and Boards - bleed proof, cartridge paper, layout paper, grid, tracing paper, corrugated card, duplex board, foil lined board, foam core board, inkjet card, solid white board. • Natural Timber - ash, , beech, mahogany, oak, larch, pine, spruce • Manufactured Timber - medium density fibreboard (MDF), plywood, chipboard. • Metals - low carbon steel, cast Iron, high carbon/tool steel • Non ferrous metals - aluminum, copper, tin, .zinc • Alloys - brass, stainless steel, high speed steel. • Plastics - acrylic (PMMA), high impact polystyrene (HIPS), high density polythene (HDPE), polypropylene (PP), polyvinyl chloride (PVC), polyethylene terephthalate (PET),phenol formaldehyde (PF), epoxy resin (ER), melamine-formaldehyde (MF), polyester resin (PR), urea-formaldehyde (UF) • Textiles - cotton, wool, silk • Synthetic fibres - polyester, polyamide (nylon), elastane (lycra) • Blended and mixed fibres - plain weave Non-woven - bonded fabrics, felted fabrics • Knitted textiles - knitted fabrics.

Section B (30 Marks) - Specialist Technical Principles

This section covers the in-depth knowledge and understanding you need in relation to electrical and mechanical systems and components. You should also have knowledge of Materials. Other DT subjects will have a different content in this section.

If you are using the **CGP revision book** to revise then focus on **Section Three - More about Materials**, **Section Five - Wood, Metals and Polymers** and **Section Seven - Electronic and Mechanical Systems**.

WHEN TO REVISE Date	WHAT TO REVISE Key topics for revision	HOW TO REVISE Subjects to help you get started using CGP revision book	Links to Technology Student.Com	What I should know?
Week 5 Mon 1 April	2.1 Selection of materials and components	<ul style="list-style-type: none"> • p32 - Selecting materials • p82 - Properties of Components in Systems 	Revision cards for Materials about ⅓ way down the page	<ul style="list-style-type: none"> • Aesthetics: surface finish, texture and colour. • Environmental factors: recyclable or reused materials. • Availability: ease of sourcing and purchase. • Cost: bulk buying. • Social factors: social responsibility.

2019				<ul style="list-style-type: none"> Cultural factors: sensitive to cultural influences Functionality: application of use, ease of working. Ethical factors: purchased from ethical sources such as FSC.
	2.2 Forces and stresses	<ul style="list-style-type: none"> p34 - Forces and Stresses 	Forces, Moments and Equilibrium	<ul style="list-style-type: none"> Tension, compression, bending, torsion and shear. lamination, bending, folding, webbing, fabric interfacing.
	2.3 Ecological and social footprint	<ul style="list-style-type: none"> p7 - Product sustainability p9 - Product sustainability and Social Issues p11 - Products in Society Making Polyester Fibre from Plastic Bottles Youtube video showing how plastic bottles can be recycled 	Revision cards for Obsolescence about ⅔ way down the page Ecological and Social Footprint about ½ way down the page.	<ul style="list-style-type: none"> Deforestation, mining, drilling and farming. Mileage of product from raw material source, manufacture, distribution, user location and final disposal. That carbon is produced during the manufacture of products. The 6 R's - Reduce, refuse, re-use, repair, recycle and rethink. Social issues in the design and manufacture of products Safe working conditions; reducing oceanic/ atmospheric pollution and reducing the detrimental (negative) impact on others
	2.4 Sources and origins	<ul style="list-style-type: none"> p42/43 Production of Materials p44/45 More on the production of materials 	Sources and Origins about ⅔ way down the page.	ONE OF THE FOLLOWING <ul style="list-style-type: none"> Paper and board (how cellulose fibres are derived from wood and grasses and converted into paper). Timber based materials (Seasoning, conversion and creation of manufactured timbers). Metal based materials (extraction and refining). Polymers (refining crude oil, fractional distillation and cracking) Textile based materials (obtaining raw material from animal, chemical and vegetable sources, processing and spinning).
	2.5 Using and working with materials	<ul style="list-style-type: none"> p60 -Shaping Materials - Hand Tools p65 - Moulding and Joining p82 - Properties of Components in Systems p86 - Cutting, Drilling and Soldering p87 - PCB Production and Surface Treatments p111 - Working safely 	Printed Circuit Boards Soldering Safety and Soldering Flow Solder Video Materials and their working properties Powerpoint Presentation	ONE MATERIAL AREA FROM THE FOLLOWING Paper and Boards <ul style="list-style-type: none"> Flyers/leaflets and card based food packaging. How to cut, crease, score, fold and perforate card. Timber based materials <ul style="list-style-type: none"> Traditional timber children's toys and flat pack furniture. Seasoning to reduce moisture content of timbers How to cut, drill, chisel, sand and plane Metal based materials <ul style="list-style-type: none"> Cooking utensils and hand tools. Annealing to soften material to improve malleability How to cut, drill, turn, mill, cast, bronze and weld Polymers <ul style="list-style-type: none"> Polymer seating and electrical fittings Stabilisers to resist UV degradation. Textile based materials <ul style="list-style-type: none"> Sportswear and furnishings Flame retardants reduce combustion and fire hazards How to sew, pleat, gather, quilt and pipe Electronic and mechanical systems <ul style="list-style-type: none"> motor vehicles and domestic appliances Photosensitive PCB board in PCB manufacture and anodizing aluminium to improve surface hardness How to cut, drill and solder
Week 4 Tue 23 April 2019	2.6 Stock forms, types and sizes	<ul style="list-style-type: none"> p84 - Standard Components in Systems p57 - Stock forms and standard components - WMP p59 - More standard components Electronic Systems - Powerpoint looking at Mechanical and Electronic Systems 	Electronics and Systems about ¾ way down the page. Electronic Systems Microcontrollers	ONE MATERIAL AREA FROM THE FOLLOWING Paper and Boards <ul style="list-style-type: none"> sheet, roll and play sold by size eg A3, thickness, weight and colour standard components eg fasteners, seals and bindings cartridge paper and corrugated card. Timber based <ul style="list-style-type: none"> planks, boards and standard moldings sold by length, width, thickness and diameter standard components eg woodscrews, hinges, KD fittings. Metal based <ul style="list-style-type: none"> sheet, rod, bar and tube sold by length, width, thickness and diameter. standard components eg rivets, machine screws, nuts, and bolts. Polymers <ul style="list-style-type: none"> sheet, rod, powder, granules, foam and films sold by length, width, gauge and diameter standard components eg screws, nuts and bolts, hinges.

				Textiles <ul style="list-style-type: none"> yarns and fabrics sold by roll size, width, weight and ply standard components eg zips, press studs, velcro. sold by quantity, Electrical and Mechanical <ul style="list-style-type: none"> volt and current rating standard components eg E12 resistor series, dual in line IC packages (DIL), microcontrollers (PIC).
	2.7 Scales of Production	<ul style="list-style-type: none"> p36 - Scales of production p40 - Production Aids 	Revision cards for Production Methods and Commerce about ⅔ way down the page Scales of Production about ⅔ way down the page. Flow or Wave Soldering	<ul style="list-style-type: none"> prototype batch mass continuous.
	2.8 Specialist Techniques and processes	<ul style="list-style-type: none"> p61 - Shaping Materials - Power and Machine Tools p63 - Shaping Techniques p38 - Quality Control p65 - Moulding and Joining 	Materials - Working with woods, metals and polymers about ¾ way down the page.	A range of tools, equipment and processes that can be used to shape, fabricate, construct and assemble high quality prototypes including <ul style="list-style-type: none"> die cutting, perforation, turning, sawing, milling, drilling, brazing, welding, lamination, soldering, 3D printing, vacuum forming, blow moulding, casting, injection moulding, extrusion batik, sewing, bonding, creasing, pressing, drape forming, bending, folding Commercial processes <ul style="list-style-type: none"> Papers and boards (offset lithography and die cutting). Timber based materials (routing and turning). Metal based materials (milling and casting). Polymers (injection molding and extrusion). Textile based materials (weaving, dying and printing). Electrical and mechanical systems (pick and place assembly and flow soldering) Quality Control <ul style="list-style-type: none"> Papers and boards (registration marks). Timber based materials (dimensional accuracy using go/no go fixture). Polymers (dimensional accuracy by selecting correct laser settings). Textile based materials (dimensional accuracy checking a repeating print against an original sample). Electrical and mechanical systems (UV exposure, developing and etching times in PCB manufacture)
	2.9 Surface treatments and finishes	<ul style="list-style-type: none"> p68 - Treatments and Finishes 	Surface treatments and finishes very near the bottom of the page.	

Tue 23 April 2019	Textiles Students Only	<ul style="list-style-type: none"> p70 - Fabrics and their properties p72 - Standard components and Tools p74 - Joining and shaping fabrics p78 - Dyeing p80 - Printing 		
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Tue 23 April 2019	Paper and Board	<ul style="list-style-type: none"> p46 -Properties of Paper and Board p48 - Standard components p49 - Working with Paper and Board p51 - Printing Techniques p53 - Paper and Board Finishes 		
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Section C (30 Marks) - Designing and Making Principles

This section covers the in-depth knowledge and understanding you need in relation to electrical and mechanical systems and components. Other DT subjects will have a different content in this section.

If you are using the **CGP revision book** to revise then focus on **Section Eight - Designing and Making**.

WHEN TO REVISE Date	WHAT TO REVISE Key topics for revision	HOW TO REVISE Subjects to help you get started using CGP revision book	Links to Technology Student.Com	What I should know?
Week 3 Mon 29 April 2019	3.1 Investigation, primary and secondary data	<ul style="list-style-type: none"> • p90 - Understanding User Needs • p94 - Market research • p96 - Product Analysis • p92 - Design Briefs and Specifications 	Revision cards for Anthropometrics, Ergonomics and Inclusive Design about ½ way down the page Primary Sources of Data about ¾ way down the page.	<ul style="list-style-type: none"> • market research, interviews and human factors including ergonomics focus groups and product analysis and evaluation • the use of anthropometric data and percentiles.
	3.2 Environmental, social and economic challenge	<ul style="list-style-type: none"> • p9 - Product sustainability and Social Issues 		<ul style="list-style-type: none"> • deforestation - possible increase in carbon dioxide levels leading to potential global warming • the need for fair trade.
	3.3 The work of others	<ul style="list-style-type: none"> • p89 - Looking at the Work of Designers 	The work of designers, design movements and design companies Revision cards for Art Movements and Designers and Companies about ⅔ way down the page	3 from the following designers <ul style="list-style-type: none"> • Harry Beck, Marcel Breuer, Coco Chanel, Norman Foster, Sir Alec Issigonis, William Morris, Alexander McQueen, Mary Quant, Louis Comfort Tiffany, Raymond Templer, Marcel Breuer, Gerrit Reitveld, Charles Rennie Macintosh, Aldo Rossi, Vivienne Westwood. 3 from the following companies <ul style="list-style-type: none"> • Alessi, Apple, Braun, Dyson, Gap, Primark, Under Armour , Zara.
Week 2 Mon 6 May 2019	3.4 Design strategies	<ul style="list-style-type: none"> • p98 - Design Strategies 	Designing and Making Principles about ¾ way down the page.	<ul style="list-style-type: none"> • sketching • modelling • testing and evaluation of their work to improve outcomes.
	3.5 Communication of Design Ideas	<ul style="list-style-type: none"> • p101 - Drawing techniques • p103 - More on drawing techniques 	Communicating Design Ideas near the bottom of the page.	<ul style="list-style-type: none"> • freehand sketching, isometric and perspective • 2D and 3D drawings • system and schematic diagrams • annotated drawings that explain detailed development or the conceptual stages of designing • exploded diagrams to show constructional detail or assembly • working drawings: 3rd angle orthographic, using conventions, dimensions and drawn to scale • audio and visual recordings in support of aspects of designing: eg interviews with client or users • mathematical modelling • computer based tools
	3.6 Prototype development	<ul style="list-style-type: none"> • p99 - Exploring and Developing a Design • p107 - Developing Prototypes 	Revision cards for Model Making about ⅓ way down the page	<ul style="list-style-type: none"> • modelling: working directly with materials and components, eg card modelling, producing a toile when designing garments, constructing a circuit using breadboard
Week 1 Mon 13 May 2019	3.7 Selection of materials and components	<ul style="list-style-type: none"> • p105 Manufacturing Specification • p32 - Selecting materials 	Manufacturing Specification	<ul style="list-style-type: none"> • functional need • cost • availability
	3.8 Tolerances	<ul style="list-style-type: none"> • p38 - Quality Control • p84 - Standard Components in Systems and Control 	Tolerances near the bottom of the page.	<ul style="list-style-type: none"> • Work accurately using tolerances. • How a range of materials are cut, shaped and formed to designated tolerances. • Why tolerances are applied during making activities?
	3.9 Materials management	<ul style="list-style-type: none"> • p109 - Using Materials Efficiently 	Material Management near the bottom of the page.	<ul style="list-style-type: none"> • The importance of planning the cutting and shaping of material to minimise waste eg nesting of shapes and parts to be cut from material stock forms. • How additional material may be removed by a cutting method or required for seam allowance, joint overlap etc. • Use appropriate marking out methods, data points and coordinates • The value of using measurement and marking out to create an accurate and quality prototype. • The use of data points and coordinates including the use of reference points, lines and surfaces, templates, jigs and/or patterns
	3.10 Specialist tools and equipment	<ul style="list-style-type: none"> • p61 - Shaping materials - Power and Machine Tools • p63 - Shaping Techniques • p65 - Moulding and Joining • p86 - Cutting, Drilling and Soldering 	You may want to explore several sections on www.technologystudent.com Equipment and Processes Resistant Materials Computer Numeric Control (CNC)	<ul style="list-style-type: none"> • How to select and use specialist tools and equipment, including hand tools, machinery, digital design & manufacture, appropriate for the material and/or task to complete quality outcomes. • How to use them safely to protect themselves and others from harm

	3.11 Specialist techniques and processes	<ul style="list-style-type: none"> • p68 - Treatments and finishes 	Finishes to wood and metals Look about ½ way down the page for some revision cards. Surface treatments and finishes very near the bottom of the page	<ul style="list-style-type: none"> • How to select and use specialist techniques and processes appropriate for the material and/or task and use them to the required level of accuracy in order to complete quality outcomes. • How to use them safely to shape, fabricate and construct a high quality prototype, including techniques such as wastage, addition, deforming and reforming. <p>Surface treatments and finishes</p> <ul style="list-style-type: none"> • Students should know and understand that surface treatments and finishes are applied for functional and aesthetic purposes. • How to prepare a material for a treatment or finish. How to apply an appropriate surface treatment or finish.
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Week 0 - Mon 20 May 2019 - Your Exam is on Friday 24th May - Good Luck!