

Revising GCSE Design and Technology

Topics on this paper	Pages to revise in the revision book
<ul style="list-style-type: none"> - Mechanical devices <ul style="list-style-type: none"> o Different Types of Movement o Changing Magnitude and Direction of Force 	P. 48-51
<ul style="list-style-type: none"> - Materials and their working properties - <i>Students should know and understand the categorisation of the types and properties of the following materials.</i> <ul style="list-style-type: none"> o Papers & Boards o Natural & Manufactured Boards o Metals & Alloys o Polymers o Textiles 	P. 60-81
<ul style="list-style-type: none"> - Specialist technical principles - <i>In addition to the core technical principles, all students should develop an in-depth knowledge and understanding of the following specialist technical principles in at least one material category:</i> <ul style="list-style-type: none"> o Selection of materials or components o Forces and stresses o Ecological and social footprint o Sources and origins o Using and working with materials o Stock forms, types and sizes o Scales of production o Specialist techniques and processes o Surface treatments and finishes 	P. 60-81 P. 92-107
<ul style="list-style-type: none"> - Designing and making principles <ul style="list-style-type: none"> o Investigation, primary and secondary data o Environmental, social and economic challenge o The work of others o Design strategies o Communication of design ideas o Prototype development o Selection of materials and components o Tolerances o Material management o Specialist tools and equipment o Specialist techniques and processes 	P. 22- 35

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All students have received the revision book Collins AQA GCSE 9-1 revision _____ and the below table refers to the pages in this book which students need to learn and memorise for the examination. The topics on paper 1 are set out below along with the pages in the revision book.

Topics on this paper	Pages to revise in the revision text book
<p>New and emerging technologies- <i>Students must know and understand the impact of new and emerging technologies on contemporary and potential future scenarios</i></p> <ul style="list-style-type: none"> ○ Industry ○ Enterprise ○ Sustainability ○ People ○ Culture ○ Society ○ Environment ○ Production Techniques & Systems ○ How the critical evaluation of new and emerging technologies informs design decisions 	P.122-127
<p>Energy generation and storage - <i>Students should understand how energy is generated and stored and how this is used as the basis for the selection of products and power systems.</i></p> <ul style="list-style-type: none"> ○ Fossil Fuels ○ Nuclear Power ○ Renewable Energy ○ Energy Storage Systems (Inc Batteries) 	P.46-47
<p>- Developments in new materials - <i>Students should be aware of developments in new materials.</i></p> <ul style="list-style-type: none"> ○ <i>Modern Materials</i> ○ <i>Smart Materials</i> ○ <i>Composite Materials</i> ○ <i>Technical Textiles</i> 	P. 72-73
<p>- Systems approach to designing - <i>Students should consider electronic systems including programmable components to provide functionality to products and processes, and enhance and customise their operation.</i></p> <ul style="list-style-type: none"> ○ <i>Inputs</i> ○ <i>Processes</i> ○ <i>Outputs</i> 	P. 9-11

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Where are the revision resources?

Revision topics	What resources to use (website links, student: drive titles of folders/ documents; books recommended etc.)
Paper 1	<u>Technologystudent.</u> This is a comprehensive website written by a Technology Teacher.
Fill in the topic for this paper here.	<u>NEW AQA D&T BBC Bitesize</u> <u>Exam practice questions</u> Collins AQA GCSE 9-1revision Design and Technology ISBN 978-0-00-822740-1

Three Examination Tips Specific to this Subject

- Some design based questions will ask you to explain using “notes and sketches” or “annotated sketches”. Ensure all sketches with annotations referring directly to the question.
- Take note of the available marks. Responses should meet or exceed them.
- Evaluation based questions require comparisons to be made. Bullet points are a good way to provide clarity. Clearly show where you are giving reasons for an answer and where you obtained the information. Make sure everything you write is relevant to the question.

Product Design GCSE Key Words and Terms

Word Or Term	Definition/ Description	Revised
Cultural influences	Cultural influences on design. Culture is the way that history and beliefs influence society. This varies a lot between countries or even between different groups within the same society. ... The designer has to investigate each cultural group that might be affected by a product to ensure that the design is suitable.	
Marketing Pull	Market pull. Market pull is when product ideas are produced in response to market forces. Examples of market influences include: A demand from consumers for new or improved products. A competing product is launched by another manufacturer.	
Technology Push	Technology push is when products are re-designed because of changes in materials or manufacturing methods. This might mean that new materials have become available, with improved properties; or that improvements in manufacturing processes mean a manufacturer can make the product cheaper or more efficiently, which reduces manufacturing costs.	
CAD	Computer aided design eg Photoshop	
CAM	Computer Aided manufacture EG laser cutting	
Consumer protection legislation.	The law gives customers protection against unfair selling practices. You do not need to know specific Acts but you do need to understand how fair trading regulations protect consumers.	
Design cycle	Investigate, Plan, create, evaluate	
Iterative design	Prototype, design, evaluate	
Sustainability	Avoidance of the depletion of natural resources in order to maintain an ecological balance.	
Fair trade	Trade between companies in developed countries and producers in developing countries in which fair prices are paid to the producers.	
Product Miles	Product miles are the total distance produce is transported from its place of growth or production to the place of consumption. The concept of product miles is widely used in food production where there is a push by consumers for locally produced products.	

The 6's	<p>Designers need to take responsibility for their designs and be more than just aware of the need to protect our environment and raw materials from being used up.</p> <p>The Six Rs of sustainability help designers think about designs and design in the following way:</p> <p>RETHINK - our current lifestyles and the way we design and make.</p> <p>REFUSE - to buy materials and products that are unsustainable.</p> <p>REDUCE - the amount of energy and materials used to manufacture a product.</p> <p>REUSE - the product for something else so you don't need to throw it away.</p> <p>REPAIR - the product so you don't need to throw it away.</p> <p>RECYCLE - finally take the product apart and categorise the parts ready for being converted into another product. This uses a lot of energy.</p>	
Green Design	Is the philosophy of designing physical objects, the built environment, and services to comply with the principles of social, economic, and ecological sustainability.	
Ferrous Metal	Containing Iron. The most common type of ferrous metal is low-carbon steel. This contains up to 0.3 percent carbon. It is stronger than most non-ferrous metals, woods and plastics. Compared to other metals, it is easy to machine, tough and cheap. However, it is prone to corrosion and rusting.	
Non ferrous metal	Not Containing Iron. Most of the common non-ferrous metals have good corrosion resistance. These include:	
Alloys	A metal made by combining two or more metallic elements, especially to give greater strength or resistance to corrosion.	
Stock Forms	The standard sizes and forms that materials are available to buy in. eg, Rod, blank etc	
Human Factors	Is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance.	
Accessibility	Accessibility refers to the design of products, devices, services, or environments for people who experience disabilities.	
Anthropometrics	Is the study of the sizes of people in relation to products. For example, chairs used in schools need to be suitable for the average size of pupils in the schools.	
Ergonomics	Is the relationship between people and the products which they use. Anthropometric data is used to help design products to meet ergonomic needs. Ergonomics also considers the force a person can apply, for example when using a tin opener, or the pedals of a car.	
Manufacturing systems	A manufacturing system can be defined as the arrangement and operation of machines, tools, material, people and information to produce a value-added physical, informational or service product whose success and cost is characterized by measurable parameters. Definition of manufacturing system design.	
Scales of production	See Below	

One off	IS when only one product is made at a time. Every product is different so it is labour intensive. Products may be made by hand or a combination of hand and machine methods.	
Batch	Is when a small quantity of identical products are made. Batch production may also be labour intensive, but jigs and templates are used to aid production. Batches of the product can be made as often as required. The machines can be easily changed to produce a batch of a different product.	
Mass	Is when hundreds of identical products are made, usually on a production line. Mass production often involves the assembly of a number of sub-assemblies of individual components. Parts may be bought from other companies. There is usually some automation of tasks (eg by using Computer Numerical Control machines) and this enables a smaller number of workers to output more products.	
Continues	Production is when many thousands of identical products are made. The difference between this and mass production is that the production line is kept running 24 hours a day, seven days a week to maximise production and eliminate the extra costs of starting and stopping the production process. The process is highly automated and few workers are required.	
Just in Time (JIT)	Is an inventory strategy companies employ to increase efficiency and decrease waste by receiving goods only as they are needed in the production process, thereby reducing inventory costs. This method requires producers to forecast demand accurately.	
pre-manufactured standard components	Bought in parts of a product eg hinges, screws nails etc.	
Finish/ Finishes	The coating applied to a material eg Varnish/ paint wax etc.	
Smart Materials	Smart materials can change their properties in response to an external stimulus.	
Precious Metal Clays (PMC)	Is made from 99% gold or silver and 1% clay. It can be shaped at room temperature, then heated. It's very expensive and mainly used for jewellery.	
corn starch polymers	is used to replace oil-based thermoplastics in packaging. It is made from high starch vegetables including potatoes, corn and maize. It is biodegradable and environmentally friendly.	
Thermochromic pigments	An ink or pigment which can change colour or disappear when the temperate changes.	
shape memory alloys	Shape Memory Alloys (SMAs) are a unique class of metal alloys that can recover apparent permanent strains when they are heated above a certain temperature. The SMAs have two stable phases - the high-temperature phase, called austenite and the low-temperature phase, called martensite.	
Quantum Tunnelling Composite (QTC)	https://en.wikipedia.org/wiki/Quantum_tunnelling_composite	
Nano Materials	A material having particles or constituents of nanoscale dimensions, or one that is produced by nanotechnology.	
The functions of packaging	Protect, inform, contain, transport, preserve and display;	
Composite	A Composite material is a material made from two or more	

materials	constituent materials with significantly different <u>physical</u> or <u>chemical properties</u> that, when combined, produce a material with characteristics different from the individual components.	
Quality control	A system of maintaining standards in manufactured products by testing a sample of the output against the specification.	
Quality assurance	The maintenance of a desired level of quality in a service or product, especially by means of attention to every stage of the process of delivery or production.	
ISO 9000	ISO 9000 is a set of international standards on quality management and quality assurance developed to help companies effectively document the quality system elements to be implemented to maintain an efficient quality system. They are not specific to any one industry and can be applied to organizations of any size.	
Design Brief	A design brief is a written document for a design project developed by a person or team (the 'designer' or 'design team') in consultation with the 'client'. They outline the deliverables and scope of the project including any products or works (function and aesthetics), timing and budget.	
Specification	An act of identifying something precisely or of stating a precise requirement.	
Inclusive design	Inclusive design) refers to broad-spectrum ideas meant to produce buildings, products and environments that are inherently accessible to older people, people without disabilities, and people with disabilities.	
Copyright	The exclusive and assignable legal right, given to the originator for a fixed number of years, to print, publish, perform, film, or record literary, artistic, or musical material.	
Patent	A government authority or licence conferring a right or title for a set period, especially the sole right to exclude others from making, using, or selling an invention.	
Registered designs.	A design refers to the features of a shape, configuration, pattern or ornament applied to an article by any industrial process. If you register a design, you will be protecting the external appearance of the article. Registered Designs are used primarily to protect designs for industrial use.	
Marketing	The action or business of promoting and selling products or services, including market research and advertising.	
Branding	The process involved in creating a unique name and image for a product in the consumers' mind, mainly through advertising campaigns with a consistent theme.	
Consumer Groups	Consumer organizations are advocacy groups that seek to protect people from corporate abuse like unsafe products, predatory lending, false advertising, astroturfing and pollution. Consumer organizations may operate via protests, litigation, campaigning, or lobbying.	
Risk Assessment	A systematic process of evaluating the potential risks that may be involved in a projected activity or undertaking.	
Thermoplastics	A thermoplastic is a <u>material</u> , usually a <u>plastic polymer</u> , which becomes soft when heated and hard when cooled. Thermoplastic materials can be cooled and heated several times without any	

	change in their chemistry or mechanical properties.	
Thermosetting plastics	Thermoset, or thermosetting, plastics are synthetic materials that strengthen during being heated, but cannot be successfully remolded or reheated after their initial heat-forming. This is in contrast to thermoplastics, which soften when heated and harden and strengthen after cooling.	
Manufactured boards	Engineered wood, also called composite wood, man-made wood, or manufactured board, includes a range of derivative wood products which are manufactured by binding or fixing the strands, particles, fibres, or veneers or boards of wood, together with adhesives, or other methods of fixation to form composite materials.	
Softwoods	Softwood is <u>wood</u> from <u>gymnosperm</u> trees such as <u>conifers</u> . The term is opposed to <u>hardwood</u> , which is the wood from <u>angiosperm</u> trees.	
Hardwoods	Hardwood is <u>wood</u> from <u>dicot angiosperm</u> trees. The term may also be used for the trees from which the wood is derived; these are usually broad-leaved temperate and <u>tropical forests</u> . In <u>temperate</u> and <u>boreallatitudes</u> they are mostly <u>deciduous</u> , but in <u>tropics</u> and <u>subtropics</u> mostly <u>evergreen</u> . Hardwood contrasts with <u>softwood</u> (which is from <u>gymnosperm</u> trees).	
Paper Stock Sizes	See Below	

