



DESIGN AND TECHNOLOGY

How to prepare for the GCSE Design and Technology mock

- 1) Look at the topic list and highlight areas of weakness/strength.
- 2) For each topic, revisit purple folder of notes from Y10.
- 3) Log on to SENECA and find the topic area in GCSE AQA D&T.
- 4) Make flashcards/mindmaps/post it notes/posters for each topic.
- 5) Once you have revised a topic, test your self using SENECA.
- 6) Do the two exemplar/past papers and mark yourself.
- 7) Have a go at the revision booklets of past questions that are on class charts and have been emailed you

Useful websites

www.senecalearning.com (search for design and technology)

www.technologystudent.com

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GCSE Design & Technology Theory checklist

Section A – Core technical principles (20 marks) A mixture of multiple choice and short answer questions assessing a breadth of technical knowledge and understanding.



1.1 New and emerging technologies

Topic: Industry
The layout of a factory
Automation
Robotics

Topic: Enterprise
Crowdfunding
Virtual marketing and retail
Cooperatives
Fairtrade

Topic: Sustainability
Finite resources
Non finite resources
Disposal of waste

Topic: People
How technology push/market pull affects choice
Changing job roles due to technological change

Topic: Culture
Changes in fashion/trends
Respecting other faiths/beliefs

Topic: Society
Design for disabilities
Design for the elderly
Design for different religious groups

Topic: Environment
The affect of continuous improvement
The affect of efficient working
The affect of pollution
The affect of global warming

Topic: Production techniques and systems
Automation
Computer aided design (CAD)
Computer aided manufacture (CAM)
Flexible manufacturing systems (FMS)
Lean manufacturing

Topic: Design decisions
Planned obsolescence
Design for maintenance
Ethics
Tend of life disposal

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1.2 Energy generation and storage

Topic: Fossil Fuels. <i>Arguments for and against</i>
Coal
Oil
Gas

Topic: Renewable energy <i>How power is generated from and arguments for and against</i>
Wind
Solar
Tidal
Hydro electrical
Biomass

Topic: Nuclear power
How it is generated
Arguments for and against

Topic: Energy storage
Kinetic pumped storage
Alkaline and rechargeable batteries

1.3 Developments in new materials

You need to know the definition of each of the following groups. You also need to know at least **two properties** and at least **1 product/application** for the following materials:

Topic: Modern materials
Graphene
Metal foam
Titanium
Coated metals
LCD's
Nanomaterials

Topic: Smart materials <i>The definition plus understanding of the following:</i>
Shape memory alloys
Photochromic pigments
Thermochromic pigments

Topic: Technical textiles <i>How fibres are spun to make enhanced fabrics</i>
Conductive fabrics
Fire resistant fabrics
Micro encapsulation

1.4 Systems approach to designing

Topic: Inputs
Light sensors
Temperature sensors
Switches
Pressure sensors

Topic: Processes
Programming microcontrollers as counters, timers and for decision making

Topic: Outputs
Buzzers
Speakers
lamps

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1.5 Mechanical devices

You need to know what each of the following is and applications/examples of use.

Topic: Movement
Linear movement
Reciprocal movement
Oscillating movement
Rotary movement

Topic: Levers
First order levers
Second order levers
Third order levers

Topic: Rotary systems
Cams and followers
Simple gear trains
Pulleys and belts

1.6 Materials and their working properties

You need to know at least **two properties** and at least 1 product/application for the following materials:

Topic: Paper
Bleed proof
Cartridge
Grid
Layout
Tracing

Topic: Board
Corrugated card
Duplex board
Foil lined board
Foam core board
Inkjet card
Solid white board

Topic: Natural and manufactured timbers <i>Hardwoods</i>
Ash
Beech
Mahogany
Oak
Balsa

Topic: Softwoods
Larch
Pine
Spruce

Topic: Man made boards
MDF
Plywood
Chipboard

Topic: Polymers <i>thermoforming</i>
acrylic (PMMA)
high impact polystyrene (HIPS)
high density polythene (HDPE)
polypropylene (PP)
polyvinyl chloride (PVC)
polyethylene terephthalate (PET)

Topic: Polymers <i>thermosetting</i>
Epoxy resin (ER)
Melamine-formaldehyde (MF)
Phenol formaldehyde (PF)
Polyester resin (PR)
Urea-formaldehyde (UF).

Topic: Metals and alloys <i>Ferrous metals</i>
Low carbon steel
Cast iron
High carbon steel (tool steel)

Topic: Non ferrous metals
Aluminium
Copper
Tin
zinc

Topic: Alloys
Brass
Stainless steel
High speed steel

Topic: Textiles <i>Natural fibres</i>
Cotton
Wool
Silk

Topic: Textiles <i>Synthetic fibres</i>
Polyester
Polyamide (nylon)
Elastane (lycra)

Topic: Textiles <i>Blended fibres</i>
Cotton/polyester

Topic: Textiles <i>Non woven</i>
Bonded
Felted

Topic: knitted
Knitted fabrics

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Specialist Technical Principles

Your specialist material is **TIMBER**. You need to answer all of the questions in this section that relate to timber or use timber in your answers.

Section B – Specialist technical principles (30 marks) Several short answer questions (2–5 marks) and one extended response to assess a more in depth knowledge of technical principles.

Selection of materials or components

Content

Functionality: application of use, ease of working.

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.

Cultural factors: sensitive to cultural influences.

Ethical factors: purchased from ethical sources such as FSC.

Forces and stresses

Topic: The impact of forces and stresses and how materials can be reinforced and stiffened

Tension, compression, bending, torsion and shear.

Using and working with materials

Topic: Modification of properties for specific purposes

Seasoning to reduce moisture content of timbers (timber based materials).

Ecological and social footprint

Topic: Issues in the design and manufacture of products

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.

Ecological and social footprint

Topic: the six R's

Reduce, refuse, re-use, repair, recycle and rethink.

Ecological and social footprint

Topic: Social issues

Safe working conditions; reducing oceanic/ atmospheric pollution and reducing the detrimental (negative) impact on others.

Sources and origins

Topic: Primary sources of timber

seasoning, conversion and creation of manufactured timbers.