Summer 2023Design & Technology GCSE Eduqas

Paper 1		
	Section 1 – Core Knowledge and Understanding	**My Revision notes**

1.1 - Design and Technology and our world.	• The impact of new and emerging technologies on industry and enterprise.
	  ○ Consumer choice
	  ○ Product life cycle
	  ○ People culture and society
	  ○ Production techniques and systems.
	  ○ Computer Aided Design /Computer Aided Manufacture
	  ○ Sustainability and environmental issues
	  ○ The 6 R's of sustainability
	  ○ Fairtrade
	  ○ Carbon footprint
	  ○ How energy is stored and generated
		Page 1-10

1.2 - Smart materials, composites and technical textiles	• **Smart materials** – materials that react to changes in environment
	  ○ How do smart materials react to changes to temperature, light and electronic inputs.
	• **Composites** – two or more materials joined together to create a new material.
	  ○ Carbon Fibre
	  ○ Kevlar
	  ○ GRP – glass reinforce plastic.
	• **Technical Textiles** – engineered with a specific performance characteristic suitable for a particular function.
	  ○ Interactive (Conductive threads)
	  ○ Microfibres (lightweight)
	  ○ Phase changing (D3o)
	  ○ Breathable (Gore-Tex)
	  ○ Sun protective. (UV resistant)
	  ○ Geotextiles (road and building)
	  ○ Rhovyl (non-flammable)
		Page 10- 14

1.3 – Electronic and	• **Electronic control systems**
	  ○ How input, output and control systems work in a circuit.
	• **programmable components**
	  ○ microcontrollers (embedded into a program)
	  ○ flowcharts (graphical view of a program)
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1.4 - mechanical components and devices	• **Types of motion** – there are four types of motion:
	  ○ Rotary (circular)
	  ○ Linear (straight line)
	  ○ Oscillating (back and forth on a circular path)
	  ○ Reciprocating (back and forth in a straight line)
	• **Mechanical systems** – a system of creating movement.
	• **Mechanical components:**
	  ○ Levers – a bar that pivots to create motion
	  ○ Linkages – used to redirect forces
	  ○ Cams – used to create a rotary motion
	  ○ Gears – used to transfer rotary motion
	  ○ Belt drives - used to transfer rotary motion
	  ○ Rack and pinion – convert rotary to linear motion
		Page 18 – 22

1.5 Materials and their working properties	• **Papers & boards**
	  ○ categorising papers and boards – sizes, weights, types.
	  ○ card and cardboard – type and uses.
	  ○ laminating – coating and waterproofing paper and boards.
	• **Natural & manufactured timber**
	  ○ Hardwoods and softwoods – type and uses
	  ○ Manufactured boards
	  ○ Finishes applied to enhance appearance and protect the timber.
	• **Ferrous & non-ferrous metals**
	  ○ Ferrous metals – types and uses
	  ○ Non-ferrous metals – types and uses
	  ○ Alloys – types and uses
	  ○ Finishes applied to enhance appearance and protect the metals.
	• **Thermoforming & thermosetting polymers**
	  ○ Thermoforming polymers – Once heated they can be reshaped - different types and uses
	  ○ Thermosetting polymers – Once heated they cannot be reshaped different types and uses
	• **Fibres & textiles**
	  ○ Natural polymers – sources and uses.
	  ○ Manufactured polymers – properties and uses
	  ○ Blending and mixing fibres – properties and uses
	  ○ Woven and knitted textiles – properties and uses
		Page – 22- 33

Section 2 – In depth Knowledge and Understanding		

2.8 natural and Manufactured Timber	In this section you need to choose your in-depth area of focus, you should revise **Natural and Manufactured Timbers**,
	• **Primary sources** – where timbers come from.
	• **Seasoning** – natural and kiln dying of timber
	• **Types of natural timber, manufactured boards and their properties**:
	  ○ Hardwoods (Deciduous)
	  ○ Softwoods (coniferous)
	  ○ Manufactured boards (man made boards)
	• **Ecological and social footprint.**
	  ○ Deforestation
	  ○ Life cycle of timbers
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- **Selection material and components** – factors that needs considering before selecting the timber for use.
    - Functionality
    - Aesthetics
    - Environmental factors
    - Availability
    - True cost
    - Cultural and ethical factors
- **Impact of forces and stresses**
    - Reinforcing and stiffening
    - Joining and fixing
- **Stock forms, types and sizes.**
    - Natural timber –
    - PBS (Planed both sides) , PSE (planed square edge) PAR (planed all round)
    - Manufactured boards – sheet sizes
    - Mouldings and dowelling – decorative moulds – skirtings and dado rails etc
    - Veneers – thin sheets for plywood and steam bending.
- **Different scales of production**
    - One off – bespoke, one of a kind
    - Batch – repeated identical products
    - Jigs – use for holding, cutting, drilling in batch production
    - Continuous flow – CAM machines used to continuously manufacture products.
- **Specialist techniques and processes**
    - Wastage - Cutting, sawing, shaping.
    - Addition – joining using glue or joints
    - Deforming – laminating and steam bending
    - Marking out – marking areas to be wasted before cutting
    - Sawing, shaping, drilling, joining.
    - Adhesives – types of glues used with timber.
    - Woodscrews – different types – straight, Phillips and Pozidriv.
    - Knock down fittings – used in flat pack furniture.
    - Lamination and steam bending – creating complex shapes with thin layers of timber.
- **Surface treatment and finishes.**
    - Preparation and types of finishes used to enhance and protect timber.