KS4

Design Technology

Exam Details:

Exam Board: AQA

Exam consists of one paper:

Paper 1: 50% / 100 marks

(2 hrs)

Topic/Unit Focus			
METALS	**R**	**A**	**G**
Ferrous metals properties (iron, stainless steel, carbon steel)			
Non Ferrous metals properties (Aluminium, copper, tin, zinc)			
Alloy metals properties (Brass, stainless steel,pewter, copper)			
Stock forms			
Environmental impact (Sourcing and manufacture)			
Joining methods (brazing, welding, Soldering, pop rivet)			
Surface treatments and processes			
life cycle (extraction, processing, manufacture, use, disposal)			
workshop tools, equipment and casting			
PAPER AND BOARDS	**R**	**A**	**G**
Papers properties (Grid,isometric, tracing, cartridge,bleedproof)			
Card properties (Corrugated, foil lined, solid white, duplex)			
Sizes and weights (A6-A1, GSM)			
Sustainability and environmental impact			
Life cycle (source, manufacture, use and disposal)			
Joining methods and tools and equipment			
Surface finishes and printing methods			
NATURAL AND MANUFACTURED TIMBERS	**R**	**A**	**G**
Hardwoods properties (Ash, Oak, Beech, Balsa,Mahogany)			
Softwoods properties (Pine, Spruce, Larch)			
Manufactured Boards properties (MDF, Plywood, Chipboard)			
Stock forms			
Environmental impact, cultural and sustainability considerations			
Joining methods (Joints, knock down fittings, Glues and screws)			
Workshop tools and machinery for cutting, joining and shaping			
Surface treatments (veneer, varnishes, oils, paints)			
Life cycle (Source, processing, use and disposal)			
TEXTILES	**R**	**A**	**G**
Natural fibres properties (cotton, Wool, Silk)			
Synthetic fibres (Polyester, Lycra, Nylon)			
Joining methods and tools (type of stitches)			
environmental, cultural and social issues			

Topic/Unit Focus			
POLYMERS	**R**	**A**	**G**
Thermoforming plastics (acrylic, HDPE, PVC etc)			
Thermosetting plastics (Epoxy resin, Urea-formaldehyde etc)			
Bio plastics (corn starch)			
Stock forms			
Environmental impact, cultural and sustainability considerations			
Joining methods			
Workshop tools and machinery for cutting, joining and shaping			

Usage			
INVESTIGATION INTO WORK OF OTHERS	**R**	**A**	**G**
DYSON and ALESSI			
Phillippe Stark, David Adjaye, Marc Breuer			
UNDERSTANDING DESIGN STRATEGIES	**R**	**A**	**G**
Collaboration			
User centred design			
Iterative design			
Design fixation			
Systems approach design			
MATERIAL PROPERTIES	**R**	**A**	**G**
Absorbency (resistance to moisture)			
Density			
Electrical and Thermal conductivity			
Strength, Hardness, Toughness			
Malleability			
Ductility and elasticity			
FORCES AND STRESSES	**R**	**A**	**G**
Tension, Compression,Bending, Torsion, Shear			
Enhancing materials to resist forces and improve functionality			
MECHANICAL DEVICES	**R**	**A**	**G**
Levers (first order, second order and third order levers) + uses			
Linkages (bell cranks, push/pull) +uses			
Rotary systems (CAMS, pulleys and belts, Gear trains) +uses			
Types of movement (Linear, Rotary, reciprocating,oscillating)			
SYSTEMS (ELECTRONIC and MECHANICAL)	**R**	**A**	**G**
Identify electronic components and symbols and their functions			
Input components (Types of sensors and switches)			
Processes (microcontrollers, timers)			
Output components (Buzzers, speakers, lamps)			
The role of programmable components			
Drawing circuit boards. Flow charts,			
Tools and equipment, processes in manufacturing circuit boards			
COMMERCIAL PROCESSES	**R**	**A**	**G**
Metals (milling casting)			
Polymers (Injection Moulding and extrusion)			
Timbers (Routing and turning)			
Paper and boards (Offset lithography, die cutting)			

ECOLOGICAL AND SOCIAL FOOTPRINT	**R**	**A**	**G**
Deforestation, Mining, drilling, farming (society impact)			
Life cycle analysis of product or material (Carbon footprint)			
Apply the 6Rs (Reduce, reuse, refuse, repair, recycle, rethink)			
Evaluate the impact on others (pollution, habitat, conditions)			
Environmental impact, cultural and sustainability considerations			

Material selection (Finite, non finite and disposal of waste)			
IMPACT OF NEW AND EMERGING TECHNOLOGIES	**R**	**A**	**G**
Industry (Automation and robotics impact on workforce, company)			
Innovation business (crowd funding, fair trade, co-operatives, Virtual marketing and retail)			
Market pull and market push			
Changes in trends (respecting faiths and beliefs)			
Computer aided design (CAD) impact on industry, role			
Computer aided manufacture (CAM) impact on industry future role			
Just in Time (JIT) manufacture, ordering			
Lean manufacturing			
ENERGY GENERATION AND STORAGE	**R**	**A**	**G**
How is energy made from Fossil fuels (for and against arguments)			
What are fossil fuels (coal, Gas, Oil, impact and future concerns)			
How is Nuclear power generated (for and against arguments)			
Renewable Energy (wind, solar, tidal, biomass, hydro-electric)			
How is renewable energy generated (for and against arguments)			
Energy storage (Alkaline, rechargeable batteries)			
SMART AND MODERN MATERIALS	**R**	**A**	**G**
Definition of Modern materials			
Definition of Smart materials			
Named modern materials and their properties and uses			
Named Smart materials and their properties and uses			
Composite materials			