

AQA – Resistant Materials – Past Paper Analysis; Section B

2010

- **Tools & equipment** – name and use - G-clamp, saw, plane, disc sander
- **H&S** – hazard and precaution - disc sander
- **Manufacture** - Batch of 10 kitchen roll holders - standard steps
- **Material** Selection – pine nest of tables, gold ring, PP storage boxes, Aluminium tennis racket
- **Environmental** impact of wood
- Design and market influences – market push, technology pull – examples
- **Marking out** – mild steel - jig, template, datum point, scribe, centre punch, ruler, callipers
- Tolerance explained
- Quality control explained
- **Ergonomics** of a buggy – feature, explain
- **Mechanism** used on buggy with sketch diagram & explanation

2011

- **Tools & equipment** – name and use – tenon saw, file, tri square
- **H&S** – PPE – dust mask, ear defenders, apron, gauntlets, goggles, gloves, boots
- **H&S** – signs – flammable, toxic, harmful to environment
- **Manufacture** - Batch of 10 sports trophy's – plastic or wood
- **Material** Selection & source – pine kitchen stool, ABS toy digger
- **Environmental** impact of metal
- **Maintenance** – components on mountain bike that require maintenance
- **Importance** of designing with maintenance in mind
- **Marking out** – jig design to draw circle of holes 100 times
- **Use of jigs**, moulds and templates – impact on manufacture
- **Explanation of Sustainability** – examples of products at each stage – design, manufacturing & use

2012

- **Sustainability** – define; reduce, reuse, recycle, refuse, repair, rethink
- **Sustainability** – discuss glass bottles and plastic bottles
- **Manufacture** – spice jar holder – plastic, metal or wood – batch of 10
- **Tools & Equipment** – Jigsaw, Coping saw – notes and sketches for 1 process using
- **Maintenance** – importance of replaceable saw blades
- **Tools & Equipment** - Comparison – effectiveness of jigsaw & Coping
- **Smart Materials** – thermochromic, carbon fibre, polymorph, smart grease
- **Adhesives** – epoxy resin, super glue – reason for use – H&S of use
- **Adhesives** – process required – preparation, application, H&S
- Types of Research – computer desk
- Design protection - copyright, trademark, patent
- Quality Control – testing, checks, use of CAD/CAM, standards (BSI)
- **CAM** – advantages and disadvantages over traditional methods for one off

2013

- **Thermosetting & Thermoplastics** – categorisation of materials
- **Material Selection** – margarine tub & electrical socket, explanation
- **Manufacture** – batch of 10 wooden lamps – wiring switch securely
- **Material selection** – outdoor wooden chair, metal chair – reason & source
- **Environmental** impact of plastic – product lifecycle
- **Ergonomics** – wind up torch – feature & explanation
- **Anthropometric** data – importance
- Product use and suitable features – torch, gas lamp
- **Scales of Production** – one off, batch, continuous – examples
- Electronic Components – Functions - battery, switch, motor, lamp, speaker
- Schematic diagram – battery, switch, motor
- **Copper wire** – copper and insulation – reasons for use
- **H&S** – Soldering – hazard, precaution

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2014

- **Manufacture** – batch of 10 notepad holders – wood, plastic or metal
- **Materials** – manufactured board – Plywood, Chipboard
- **Material Selection** – advantages of MDF over timber
- **Environmental** impact of MDF – lifecycle
- **Modelling materials** – Card, polymorph, Lego, balsa, modelling board
- **Prototyping** – purpose in design process
- CAD – advantages and disadvantages
- **Vacuum Forming** – flowchart explanation using symbols
- Define & Link – Market pull, technology push – product match to each
- **Maintenance** – feature of electric toothbrush and importance when designing
- **ABS** – reasons for use for electric toothbrush
- **Maintenance** – add design feature to replace batteries in bike light

2015

- **Manufacture** – one off football trophy – metal, plastic, wood – casting*
- **Fastenings** – washer, bolt, nut – function of each
- **Adhesives** – PVA & Super Glue (cyanoacrylate) – use, advantage & disadvantages
- **Adhesive** – process of using epoxy resin
- **Tools & Equipment** – comparison – cordless drill/driver vs screwdriver – pros & cons
- **Smart Material** – shape memory alloy, thermochromic, smart grease
- **Modern Materials** – Nanomaterial – define, example, explain
- **Modern Materials** – Composite – carbon fibre – use on F1 cars
- **H&S** – hazard signs – safety glasses, gloves, ear defenders, face mask
- Product Symbols – British toy mark (lion) – importance to consumer
- **Finishes** – wood – wax, varnish, polish, stain - reason
- **Finishes** – metal – galvanised, paint, lacquer, powder coating, plating – reason & technique

2016

- **Manufacture** – batch of 10 sheet metal bird feeders – metal only
- **Material selection** – kitchen spoons – beech, melamine, stainless steel
- **Industrial Process** – advantages and disadvantages
- **Ergonomics** – crutch design features
- **Mechanism** – crutch adjustment methods – wing nut vs spring clip
- **Sustainability** – wood vs metal for crutch product
- **Jig** – drilling of holes for bookcase – batch of 10
- **Explain advantages of jigs**, moulds & templates
- Client, designer, manufacturer, consumer – interaction relevant to table & chair product
- **H&S** – Pillar Drill – precautions & hazards
- **H&S** – Signs – flammable, toxic, high voltage, harmful – precautions

2017

- **Manufacture** – batch of 10 headphone stands – CAD/CAM & hand tools
- **Material Categories** – thermoplastic & thermosetting
- **Manufactured board** – advantages and disadvantages compared to timber – furniture
- **Wood Joint** – Finger Joint – flowchart process
- **Material Selection** – metal garden table, wooden table – source & reason
- **Composite Materials** – Glass Reinforced Plastic (GRP) – advantages for car bodywork
- **Scales of Production** – One off engagement ring, batch mountain bike, continuous drinks can – explain suitability of each
- **Components** – screws, dowel, corner block, hinge – use of premanufactured components
- **Ergonomics** – kettle design features and explanation
- **Anthropometric data** – how its use informed the kettle ergonomic features