**Disciplinary Knowledge in Design Technology**

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|  | **Year 7** | **Year 8** | **Year 9** | **Year 10** | | **Year 11** |
| **Disciplinary knowledge**  **-Investigate:** *Take inspiration from designers. Learning from processes, techniques of designers throughout history and across the world.*  *- Investigate new & emerging technologies.* | RM;  Tools and equipment (as below)  CAD;  CAM equipment; Laser cutter, 3D printer, Vinyl cutter  Textiles:  **Bookmark** Tie dye history and exploration of the Hippie movement.  **Bookmark & Pencil Case** History of materials, how they are made, hand embroidery and traditional textiles techniques (Bayeux tapestry, ancient Egyptian mummification) | RM; **Electronic Frame**  Tools and equipment (as below). Work of designer Morag Myerscough.  Textiles:  **Postcard Cushion** Day of the Dead (Dia de los Muertos) celebration in Mexico. Research into designers who have used this theme in their own pieces. | RM; **Pewter Keyring** (all pupils)  Biomimicry & Bio-morphism.  **Alessi Fat Man Phone Holder** (option)  Work of design company Alessi, designer Phillippe Starke  **Sweet Dispenser** (option)  Looking at branding, logos on product  Textiles:  **Pattern of the Sixties** (All pupils):  The 1960s timeline, Mary Quant, fashion changes throughout the decade.  **Architecture inspired fashion**  Product Analysis. Designer research task, fabric manipulation techniques used in fashion  **Portrait Project**  Edo Morales research, relevant portrait textiles artists | **GCSE RM; Clock Shop**  Use of CAD to create Orthographic Drawing, 3D Model & Exploded view using CAD.  **GCSE RM:** Design Movements;  Arts & Crafts movement, Bauhaus, Art Deco, Art Nouveux, De Styjl  The work of influential designers;  Marcel Breuer  William Morris  Louis Comfort Tiffany  Raymond Templier  Charles Rennie Macintosh  Ettore Sottsass  Technology -CAD/CAM  Smart Materials | **GCSE RM:**  Revision of Design movements and influential designers as covered in y10  **Creative Craft:**  Use of CAD/CAM to produce a personalise clock. | |
| **-Design:** | RM;  Design idea for Storage unit (assessment)  CAD;  Design a Keyring, Grabber toy, CAM toy.  Textiles:  **Bookmark** Design ideas for product following key criteria  **Pencil Case** redesign task (extension)  Bag design (Assessment) | RM; **Electronic Frame**  Design ideas for frame, based on Morag Myerscough design style.  Design for lunchbox set (assessment)  Textiles:  **Postcard Cushion** Design ideas for cushion. Use of colour symbolism.  African inspired cushion (Assessment) | RM; **Pewter Keyring** (all pupils)  Design ideas for Biomorphic jewellery, Design idea for Biomorphic/Bio-mimicry Household item (Assessment)  **Alessi Fat Man Phone Holder** (option) Design ideas for phone base  **Sweet Dispenser** (option)  Design Process stages  Design Ideas for sweet dispenser  Textiles:  **Pattern of the Sixties** (All pupils):  Fabric Sample design applying understanding of composition and layout  **Architecture inspired fashion**  Fashion illustration design ideas  Product board  **Portrait Project**  Design ideas, understanding how to create a successful composition | **GCSE RM;**  **Drawing skills;** 3D isometric, Crating out, Perspective Drawing, Rendering. CAD design skills using 2D design, Google Sketchup & Tinker CAD.  **Clock Shop**  Personalisation of Clock  **Small Bracket**  Personalisation of Back Board –2D Design  **Cookie Cutter**  3D design for cutter -TinkerCAD  **Wine Bottle Holder**  2D design for engraved design –2D Design  NEA:  Design ideas (sketching) | **GCSE RM:**  Design development & finalisation of proposal.  **Creative Craft:**  Design ideas for Clock, Modelling, Testing and final proposal and poster design.  Marketing methods & suitability | |
| **-Subject Knowledge:**  *Understand, select and use materials and components successfully.* | RM:  **Mobile Phone Amplifier;**  Softwood, Hardwood, Manufactured Board. Pine, Mahogany, MDF, Plywood  **Aluminium Candle Holder;**  Ferrous, Non-ferrous, Alloys, Steel Production method (local) Aluminium, Mild Steel, Stainless Steel.  **CAD;**  Types of motion, Linkages, CAMS.  Textiles:  **Bookmark** Resist dye techniques, applique, natural fabrics (silk, cotton, wool) how fabrics are made  **Pencil Case** Resist dye techniques continued, fabric properties, synthetic fabrics, comparison between fabric types, using the sewing machine | RM; **Electronic Frame**  Materials; Polymers, Thermoplastic/Thermoset plastics; Polypropylene, Urea Formaldehyde, Acrylic.  Electronic components, Input, Process, Output.  Traditional Joining methods (wood joints).  Textiles:  **Postcard Cushion** Decorative techniques, fabrics and their properties, the advantages and disadvantages of machine embroidery, fabric care and treatments | RM; **Pewter Keyring** (all pupils)  Casting Process, Finish process of Metal  **Alessi Fat Man Phone Holder** (option)  Smart Materials; Shape memory Alloy, Thermochromic Pigment, Thermocolour Film,  Composite Materials: Fibre Glass, Carbon Fibre, Kevlar  **Sweet Dispenser** (option)  Use of Jigs, Traditional Joining methods. Sustainability.  Textiles:  **Pattern of the Sixties** (All pupils):  Use of composition & decorative techniques. Recall of fabric types (cotton) its properties and suitability for this sample  **Architecture inspired fashion**  Fabric manipulation, garment construction, using the sewing machine  **Portrait Project**  Recall of printing & dyeing methods (resist dye techniques, stencil printing, embellishment | **GCSE RM:**  Presentation techniques,  Timber & Boards  Scales of Production,  Quality Assessment & Quality Control  Wood Joints,  Timber finishes,  Orthographic Drawing  Metals & Alloys  Metal Joining Processes  Thermoplastics  Thermosetting plastics  Bending Timbers  Production Aids  Polymer Processes (& industry)  Ergonomics & Anthropometrics  **Creative Craft:**  Develop subject knowledge of Materials; Timber & Metal types, Production planning, Use of Moulds, Jigs, formers, Product Analysis.  Develop skills & understanding of construction techniques.  Joining Metals & timbers (permanent & temporary)  Develop skills & understanding of enterprise.  Sole Trader, Partnership, Ltd company, financial elements | **GCSE RM:**  Materials, Components & Construction methods research and chosen as appropriate to final NEA project.  Revision of subject knowledge as covered in y10 | |
| **Make:**  **-***Select from and use specialist tools, processes, equipment, and machinery**precisely including CAM.* | RM:  **Mobile Phone Amplifier;**  Steel rule, Try Square, Coping Saw, Tenon Saw, Hegner Saw, Flat file, Pillar Drill, Toggle Clamp, Plane, Glass paper & Disc Sander  **Aluminium Candle Holder;**  Steel Rule, Engineers Square, Tin snips, Metal vice, Center Punch, Pillar Drill, Hammer, Engineers Square, File, Rivet gun  CAD:  Laser Cutter, Printer,  Textiles:  **Bookmark** Tie dye, hand embroidery, applique, product construction  **Pencil Case** Batik, using dyes, applique, hand embroidery, machine embroidery | RM;  **Electronic Frame;**  Mitre Frame, Lap joint Frame, Steel rule, Try Square, Marking Gauge, Use of Jigs, Tenon Saw, Shoulder Plane, Pillar Drill, Toggle Clamp. Soldering Iron, Helping hands, Wire cutters, Wire Strippers.  Textiles:  **Postcard Cushion** Hand embroidery, applique, machine embroidery, pinning and tacking | RM;  **Biomorphic cast keyring;** (all pupils)  Hacksaw, Hand drill, Mole Grips, Flat/Half round file, Wet & Dry paper, Polisher.  **Alessi Fat Man Phone Holder** (option)  Hegner Saw, File, Wet & Dry paper, Polisher, use of template, strip heater, hand drill, countersink, bradawl, screwdriver.  **Sweet Dispenser** (option)  Mortise & Tenon Joint, Steel Rule, Try Square, Use of Jigs & Templates, Hegner Saw, Disc Sander, Mortise Machine. Pillar Drill, Plane, Laser Cutter, Bradawl, Hand Drill, Countersink.  Textiles:  **Pattern of the Sixties** (All pupils):  Fabric painting, stencil print, mono print  **Architecture inspired fashion**  Toiling, making a prototype, fabric manipulation (pleats, gathers, ruffles)    **Portrait Project**  Final piece- Applique, machine embroidery, embellishment, hand embroidery, fabric painting, tie dye, stencil print | **GCSE RM;**  **Clock Shop**  Steel Rule, Try square, Jigs, Tenon Saw, Hand Drill, G Clamp, Disc Sander, Wood Stain, Danish Oil. Laser Cutter.  **Advent Angel**  Templates, Hegner Saw, Coping Saw, Disc Sander, Hand Drill, Hacksaw, Danish Oil.  **Small Bracket**  Engineers Blue, Scribe, Odd leg Calipers, Dividers, File, Metal Vice, Pillar Drill, Hand Drill, Brazing Hearth, Cold Rivet –Snap set, Ball Pien Hammer, Spot welder. Metal Paint. Table Router. Laser cutter.  **Cookie Cutter**  3D Printer  **Wine Bottle Holder**  Laser Cutter, Henger Saw, Laminating Mould, Disc Sander. Glass Paper. Varnish  **Creative Craft:**  **Small Bracket**  Engineers Blue, Scribe, Odd leg Calipers, Dividers, File, Metal Vice, Pillar Drill, Hand Drill, Brazing Hearth, Cold Rivet –Snap set, Ball Pien Hammer, Spot welder. Metal Paint. Table Router. Laser cutter.  **Cracket:**  Try square, Steel Rule, Marking Gauge, Mortise Gauge, Tenon Saw, Coping Saw, Hegner Saw, Shoulder Plane, Chisel, Mortice Machine, Pillar Drill, Table Router, Disc Sander, Glasspaper, Lathe, Screw driver, Bradawl. | **GCSE RM:**  Tools and equipment as appropriate to final NEA project  **Creative Craft:**  CAD work using 2D design, Laser Cutter, Solvent Cement. | |
| **Analyse & Evaluate:**  **-***Analyse the work of past & present designers.*  *-Test, evaluate & refine ideas*  *-Understand developments in DT, its impact on individuals, society and the environment.* | RM;  Life cycle and Environmental impact of Timber, and Life cycle and Environmental impact of Metal.  Analyse storage unit (Assessment)  CAD;  Analyse, evaluate and improve CAD drawings  Textiles:  **Bookmark** Product evaluation & product testing  **Pencil Case** Existing product evaluation | RM;  Analyse child Plastic Bottle (Assessment)  Textiles:  **Postcard Cushion** Design idea testing,Postcard evaluation | RM:  **Sweet Dispenser** (option)  Product Analysis, Evaluation of design ideas and final product  Textiles:  **Pattern of the Sixties** (All pupils):  Evaluation of samples, analysis of existing products  **Architecture inspired fashion**  Existing product anaylysis, evaluation  **Portrait Project**  Evaluation | **GCSE RM:**  Product Analysis,  Analysis of CAD work,  Analysis of sketching skills.  Product Sustainability & Environmental Issues  **Creative Craft:**  Evaluation of Final Practical pieces.  Analysis of improvements to bracket. | **GCSE RM**  NEA based on the design process, Design testing, development, Evaluation & sustainability issues.  **Creative Craft:**  Peer Evaluation of Clock number designs, and clock design ideas. | |