Carmel College Curriculum Implementation – KS 3 Long term plan Subject: Design Technology -Resistant Materials 2023-24

\*All projects are designed to progress from the previous in terms of the use of tools & equipment & processes to cover as many as possible throughout the course. Assessed homework tasks are designed to cover the design process (design, development & final design) throughout the key stage.

Y7 pupils are taught on a 2 week rotation

Y9 are encouraged to create a product they have designed at the end of each project (using the project tools), to increase independence.

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|  | Year 7 | Year 8 | Year 9 |
| Autumn half term 1  Sequential knowledge and skills | **Mobile Phone Amplifier**  ***Pupils create a Pine Mobile Phone amplifier, using a range of traditional Timber tools.***  ***This term pupils will learn about Health and safety in the workshop, timber types, life cycle & the environmental impact of using timber. They will develop practical skills, marking out, cutting & drilling timber.***  Develop subject knowledge of Materials: Timbers/Boards (Pine, Mahogany, Plywood, MDF)    Develop subject knowledge of Sustainability; Timber life cycle & Environmental impact.  Develop skills & understanding (practical skills); Health & Safety in the workshop. Timber (Marking out; Try Square, Cutting; Hegner & coping Saw, Planing, sanding, drilling; flat drill bit, filing, polishing) & relevant Health & Safety. | **Morag Myerscough Electronic Frame (new project)**  ***Pupils create a Timber based frame, using traditional Timber tools, they will learn how products are made in industry to ensure consistency and accuracy using Jigs. They will learn about Electronic components, construction and health and safety whilst soldering LED’s to illuminate their frame.***  Develop skills & understanding of manufacturing; Timber joining methods (wood joints; finger dovetail, & housing joints)  Develop skills & understanding (practical skills); Timber (Marking out; Try Square, Marking gauge, Cutting; Tenon Saw, G Clamp, joining using Mitre, Lap, housing joint; Mitre Jig) Drilling; Twist Drill bit, Adhesives; (PVA Glue & relevant Health & Safety.  \*methods used in industry to ensure quality control for consistency, accuracy (use of jigs).  Develop subject knowledge of Materials; Timbers/Boards (Ash, Oak, Teak, Chipboard)  Develop subject knowledge of Sustainability; Timber life cycle & Environmental impact | **Short 4 week introductory projects taught on rotation in RM, Food & Textiles.**  **Biomorphic Pewter Cast Jewelry**  ***In this short introduction to RM project pupils learn about Biomimicry & Bio-morphism, they will learn about metal casting. Pupils will develop practical skills shaping & finishing metal to a high standard to create a bio-morphic inspired Pewter jewelry/keyring.***  Develop subject knowledge of Materials; Metals: Alloys; Pewter  Biomimicry & Bio-morphism.  Develop skills & understanding of manufacturing; Casting process (brazing hearth, forge)  Develop skills & understanding (practical skills); Shaping Metal; drilling (hand drill, mole grips)  Finishing Metal; Cross file, Draw file, Wet & Dr, Polish & relevant Health & Safety.  \*methods used in industry to ensure quality control for consistency, accuracy moulds). |
| Assessment Content and methods used to judge learning | Assessed Design task  Ongoing assessment of homework tasks | Sustainability Assessed Design Task  Ongoing assessment of homework tasks | Combined assessment of Design Technology subject knowledge.  Final product outcome. |
| Autumn half term 2  Sequential knowledge and skills | **Mobile Phone Amplifier *(continued)***  Develop CAD skills; using 2D design, laser cutter.  Develop skills & understanding (practical skills); of joining methods & timber adhesive (screwing; bradawl, screw driver) & relevant Health & Safety. | **Electronic Frame *(Continued)***  Develop subject knowledge of Electronics; components and joining methods (Circuit board, LED, resistor, Capacitor, switch)  Develop skills & understanding; producing circuits (soldering)  Develop skills & understanding (practical skills); of electronic tools & equipment (helping hands, soldering iron, snips) & relevant Health & Safety.  Develop CAD skills; using 2D design to personalise their interior design. | **Short 4 week introductory projects taught on rotation in RM, Food & Textiles *(Continued)*** |
| Assessment Content and methods used to judge learning | Ongoing assessment of homework tasks | Assessed Final Design proposal  Final product outcome. | As rotation |
| Spring half term 3  Sequential knowledge and skills | **Mobile Phone Amplifier (continued)**  ***Continuing with the Pine Mobile Phone amplifier, this half term pupils will develop practical skills finishing & joining timber to complete a high quality product.***  Develop skills & understanding (practical skills); Timber & polymer finishes (sanding -machine & hand, polishing) & relevant Health & Safety. |  | **Short 4 week introductory projects taught on rotation in RM, Food & Textiles *(Continued)***  Plus Careers & Options for each subject |
| Assessment Content and methods used to judge learning | Ongoing assessment of homework tasks.  End of project practical skill evaluation.  End of project subject knowledge assessment |  | Subject knowledge shown in Final Design idea for Mobile Phone holder.  Practical Assessment: Completed Body & Base piece of phone holder |
| Spring half term 4 Sequential knowledge and skills | **Aluminum Candle holder**  ***Pupils create an Aluminum Candle Holder, using a range of Metal work tools. This half term pupils will develop skills marking out and cutting Aluminum.***  Develop skills & understanding (practical skills); Metal; marking out, shaping (cutting; Tin snips, vice & vice jaws) & relevant Health & Safety.  Develop subject knowledge of Materials; Metals; Aluminum, Stainless Steel, Mild Steel, |  | **If RM Technology choice taken:**  **Fat Man Mobile Phone holder**  ***Pupils create a Mobile Holder, made up of a Pine Body & Acrylic Base (of their own design)***  Develop skills & understanding of construction techniques; Shaping & Finishing methods for Timber & Polymers, bending Polymers & Temporary joining methods. Use of templates in increase accuracy, speed & profit in production.  Develop skills & understanding (practical skills); Timber (Marking out; using a template. Cutting; Coping Saw, Hegner Saw) Drilling; Hand Drill, countersink. Joining & Adhesives; PVA Glue & screws) plus relevant Health & Safety.  \*methods used in industry to ensure quality control for consistency, accuracy (use of templates).  Develop subject knowledge of Materials; Polymers; Thermoplastic, Thermosetting Plastic; Acrylic, Polypropylene, Urea formaldehyde. Smart Materials; Thermocolour Film, Thermo chromic pigment & Shape memory Alloy, Composites: Fiberglass, CRP, Kevlar. |
| Assessment Content and methods used to judge learning | Ongoing assessment of homework tasks |  | Ongoing assessment of homework tasks  Final product outcome. |
| Summer half term 5 Sequential knowledge and skills | **Aluminum Candle holder *(Continued)***  ***Continuing with the Aluminum Candle Holder project, this term pupils will develop practical skills finishing, bending & joining Aluminum to complete a high quality product.***  Develop skills & understanding (practical skills); Metal; shaping (cutting; Tin snips, vice & vice jaws), finishing (filing -cross & draw, wet & dry, polishing) & relevant Health & Safety.  Develop subject knowledge of Sustainability; Metal life cycle & Environmental impact |  | **If RM Technology choice taken:**  **Sweet Dispenser project (Revised Project)**  ***Pupils create a Pine Sweet Dispenser, using traditional Timber tools and joining methods. They will learn about timber finishes and develop CAD skills to personalise their product.***  Develop skills & understanding of construction techniques; Timber joining methods (butt, lap, mitre, housing joints mortice & housing joints,)  \*methods used in industry to ensure quality control for consistency, accuracy (jigs & templates).  Develop subject knowledge of Design Process;  Design Brief, Initial Specification,. Research; joining methods, Product Analysis. Design Ideas, Final Evaluation  Develop skills & understanding (practical skills); Timber (Marking out; Try Square, Cutting; Tenon, Hegner, Coping Saw) drilling (Flat, forstner Bit), Mortice Machine, Sanding; disc sander, filing, polishing) Adhesives (PVA Glue) & relevant Health & Safety. |
| Assessment Content and methods used to judge learning | Ongoing assessment of homework tasks |  | Ongoing assessment of homework tasks  Assessed Final Design proposal & product |
| Summer half term 6  Sequential knowledge and skills | **Aluminum Candle holder *(Continued)***  Develop skills & understanding (practical skills); Joining (riveting) & relevant Health & Safety. |  | **Sweet Dispenser *(continued)***  Develop CAD skills; using 2D design, laser cutter.  **Extension Task:**  To produce the design created in Assessed homework task for Seasonal gift using the same tools/processes used in Mobile Phone Holder & Sweet Dispenser project. Develop skills & understanding (practical skills relevant to design **\*with independence** |
| Assessment Content and methods used to judge learning | Ongoing assessment of homework tasks  Final end of year assessment based on subject knowledge.  Final product outcome. |  | Ongoing assessment of homework tasks  Final end of year assessment based on subject knowledge. |