Key Stage 3 Curriculum Journey: Subject year 8 carousel

Project 1 – Phone and Watch Organiser (Timber & Acrylic, 10 weeks)

Key Content (know that… know how…):

- Know that pine is a softwood: fast-growing, inexpensive, easy to cut but not as durable as hardwoods.
- Know that acrylic is a thermoplastic: when heated it softens and can be bent, and when cooled it hardens again.
- Know how to measure and mark timber accurately using an engineer's rule and try-square to achieve right angles.
- Know how to cut timber safely and accurately using a tenon saw and bench hook, controlling the saw stroke and maintaining accuracy on the cut line.
- Know how to drill clean, perpendicular holes using the pillar drill, with safe clamping and PPE.
- Know how to sand timber safely using the band sander, applying correct pressure and technique.
- Know how to use a strip heater to bend acrylic, including how to align acrylic on a jig to achieve a consistent 90° bend.
- Know how to assemble timber, dowel and acrylic using mechanical and adhesive joining methods, checking alignment.
- Know how to apply surface finishes (e.g. Danish oil, varnish) to protect timber and enhance aesthetics.
- Know how to test the final product for stability, accuracy and suitability for holding a phone and watch.

Prior Knowledge:

- In **Year 7**, pupils gained basic hand tool skills: sawing softwood, sanding by hand, and simple drilling with a pillar drill. They also learnt how to follow health & safety routines and use PPE correctly.
- Pupils worked with a single materials in Year 7 (timber or plastic). This project extends their knowledge into **multi-material working** (timber + plastic + dowel).
- Builds on Year 7 measuring and marking out by increasing accuracy demands (±1 mm tolerance).

- Extends Year 7 finishing experience (basic sanding) to include **application of protective finishes**.
- Develops evaluation skills: moving from simple reflection ("what went well") to testing against a specification.

KS3 National Curriculum Link:

- Use specialist tools, techniques and processes to work accurately with wood and plastic.
- Select and use materials based on properties and working characteristics.
- Understand and apply the properties of timber and thermoplastics in product design.
- Develop skills in making functional products that meet a design specification.
- Critique, evaluate and test their products against the design brief and user needs.
- Communicate design thinking through annotated sketches and prototypes.

Assessment:

- **Investigation:** Product analysis of existing organisers, discussion of user needs.
- **Making:** Quality and accuracy of timber base, dowel cutting, acrylic bending.
- **Practical application:** Safe use of tools and machines, independence in workshop.
- **Evaluation:** Structured evaluation against criteria – stability, accuracy, finish, function.
- **Reflection:** Written reflection identifying one strength and one area for improvement with justification.

Project 2 – Timber Box with Cultural Engraving (9 weeks)

Key Content (know that… know how…):

- Know that pine is a softwood suitable for box sides; MDF and plywood are manufactured boards used for stability and engraving surfaces.
- Know how a **housing joint** is used in box construction, why it is stronger than a butt joint, and how to cut it accurately with a tenon saw and chisel.
- Know how to measure and mark out joints consistently using a jig or template.

- Know how to cut timber to accurate lengths for box panels, ensuring square and flush joints.
- Know how to prepare and sand timber surfaces for a smooth, high-quality finish.
- Know how to design using **Techsoft 2D Design (CAD)**, using line and fill tools to create patterns and adjust scale.
- Know how to research cultural patterns (e.g. Islamic geometric art, Māori motifs, Celtic knotwork) and apply them to a design, respecting cultural significance.
- Know how to prepare files for **laser engraving** (CAM), including setting power and speed, and how to operate the laser cutter safely.
- Know how to assemble box components, ensuring squareness and accurate alignment of lid and base.
- Know how to apply finishes (e.g. wax, varnish) to protect timber and enhance appearance.
- Know how to evaluate the finished box for accuracy, strength, cultural design impact, and finish quality.

Prior Knowledge:

- From **Year 7**: Pupils learned simple joints (butt joints) and basic CAD (2D shapes). This project builds on that by introducing **housing joints** and more complex CAD (cultural pattern creation).
- From **Year 8 Project 1 (Organiser):** Pupils practised accurate measuring, drilling and finishing timber and bending acrylic. This accuracy and confidence transfers directly to marking and cutting joints in timber for the box.
- Builds directly on Year 8 Project 1 evaluation – moving from function (does it hold a phone/watch?) to a balance of **function + aesthetic/cultural value** (is it strong *and* visually meaningful?).
- Pupils are now expected to work with more independence: making design decisions (pattern choice), managing their own CAD files, and applying finishing techniques without step-by-step prompts.

KS3 National Curriculum Link:

- Develop research and exploration skills (analysing cultural patterns, understanding influences).
- Develop and communicate design ideas through annotated sketches, CAD and prototypes.

- Select and use from a broader, more complex range of materials (pine, MDF, plywood).
- Use jigs/templates to ensure precision and repeatability in making.
- Apply CAD/CAM to produce precise, professional-quality outcomes.
- Critique and evaluate their work and the work of others against design criteria and cultural influences.
- Understand how design and technology both reflect and influence culture and society.

Assessment:

- **Investigation:** Research into cultural design patterns and their significance.
- **Making:** Accuracy of measuring, marking and cutting joints; quality of box assembly.
- **CAD/CAM:** Creation of a cultural pattern in Techsoft 2D Design and laser engraving of lid.
- **Evaluation:** Peer and self-assessment of cultural design and construction quality.
- **Reflection:** Written evaluation of strengths, weaknesses and improvements (practical and design).