

Short-Term Design & Technology Lesson Plan

- Teacher: Mr Benjamin.
- **Subject:** Design and Technology
- **Key Stage:** Lower Key Stage 3 (Years 7-8)
- **Unit Title:** Introduction to Materials & Manufacturing: The Phone Holder Project
- **Duration:** 4-6 lessons (pending on skill level)
- **Context:** This unit introduces students to common workshop materials (e.g., wood, plastic) and basic hand-tool manufacturing techniques. The final outcome is a small, functional product.

Lesson Objectives

By the end of this unit, students will be able to:

- Identify and describe the properties of common materials (e.g., natural wood, manufactured board).
- Safely and accurately use basic hand tools such as a tenon saw, coping saw, or junior hacksaw.
- Apply a simple manufacturing process to join and shape materials.
- Explain the link between a material's properties and its suitability for a given product.

Resources

- **Classroom:** Whiteboard, projector, material samples (wood, plastic).
- **Workshop:** Workbench, vices, G-clamps, safety goggles.
- **Materials:**
 - **Wood:** Offcuts of pine or similar softwoods.
 - **Manufactured Boards:** Plywood or MDF offcuts.
 - **Plastics:** Offcuts of acrylic sheet.
 - **Fasteners:** Wood glue, small screws, or nails.

- **Tools:**
 - **Cutting:** Tenon saws, coping saws, junior hacksaws.
 - **Shaping/Finishing:** Sandpaper (various grades), rasps.
 - **Joining:** Hammers, screwdrivers, drills (cordless).

Lesson Sequence

Lesson 1 & 2: Material Investigation & Tool Safety

- **Introduction :**
 - **Starter:** Display a variety of everyday objects. Ask students to identify what they are made of and why that material was chosen. For example, why is a phone case made of plastic, not glass?
 - **Main Task:** Introduce the project brief: "Design and make a small phone holder or stand for a specific user. It must be made from at least two different materials and feature a simple join."
- **Main Activities :**
 - **Material Exploration:** In small groups, students handle and examine different material samples (pine, MDF, acrylic). They discuss and document the **properties** of each material (e.g., strength, durability, flexibility, weight).
 - **Tool Demonstration:** The teacher demonstrates the safe and correct use of the required hand tools (e.g., tenon saw, sandpaper). Emphasize safe clamping and personal protective equipment (PPE). Students practice using the tools on scrap material.
- **Plenary :**
 - **Class Discussion:** Review the properties of the materials. Ask students to predict which materials will be easy or difficult to work with for this project.

Lesson 3 &4: Measuring & Cutting

- **Introduction :**
 - **Starter:** Review tool safety and the importance of accurate measurements. Show an example of how a small measurement error can affect the final product.
- **Main Activities :**
 - **Design:** Students are provided with a simple plan for the phone holder and must measure and mark out the pieces on their chosen materials.

- **Cutting:** Under close supervision, students use the tenon saws to cut the main base and back support from a piece of wood or board. They use the coping saw or junior hacksaw to cut a simple slot for the phone or a plastic insert.
- **Plenary :**
 - **Peer Check:** Students exchange their cut pieces with a partner to check for accuracy before the next stage.

Lesson 5 & 6: Assembly & Finishing

- **Introduction :**
 - **Starter:** The teacher demonstrates how to apply a simple wood glue joint. Explain the importance of clamping to ensure a strong bond.
- **Main Activities :**
 - **Assembly:** Students glue and clamp the pieces of the phone holder together.
 - **Finishing:** Once the glue has set, students use sandpaper or sanding machine to smooth the edges and faces of their product. This step highlights the importance of a good finish in manufacturing.
 - **Final Touches:** They can then add any final components or decorative elements.
- **Plenary:**
 - **Final Review:** Students reflect on the materials and manufacturing processes they used. They answer questions like, "What was the most difficult part of the process?" or "How did the properties of the material affect the way you worked with it?"

Assessment

- **Formative:** Teacher observation, safety checks, and review of in-class work.
- **Summative:**
 - Practical skill in measuring, cutting, and joining materials.
 - The quality and accuracy of the final product.
 - The student's ability to articulate their understanding of material properties and manufacturing processes.

Differentiation

- **Support:** Students can be given pre-cut pieces to assemble, focusing solely on the joining and finishing aspects.
- **Challenge:** Students can be asked to design their own phone holder from scratch, considering a slot for a charging cable, a sound amplifier design, or incorporating a different material, like sheet metal.

