

# National Curriculum Reference

## Subject: Design Technology



**ST. GREGORY'S**  
CATHOLIC HIGH SCHOOL

### Key Stage Three:

#### Year 7:

Wooden Planter Plaque (WPP) responsibility of designer on the wider community, design strategies and communication, and making skills.

Flat-packed Phone Stand (FPS) past and present professionals, design strategies and communication, and making skills.

Light Box Project (LBP) Electronics and Materials, User needs and Design Context

#### Year 8:

Phone Chair project (PCP) past and present professionals, design strategies and communication, and making skills.

Bauhaus Stationary Tray (BST) past and present professionals, responsibility of designer on the wider community, and making skills.

Sea Life Frame (SLF) Responsibilities of Designers on the Wider Community, Design Strategies and Communicating Ideas.

#### Year 9:

Memphis Passive Amplifier (MPA) user needs, design strategies and communication, and making skills.

Mechanical Toy Project (MTP) Design Strategies and Communicating ideas, Mechanisms.

Pupils should be taught to	At St Gregory's Catholic High School, this is taught
Use research and exploration, such as the study of different cultures, to identify and understand user needs	<p>WPP, FPS, PCP, BST &amp; MPA: Research into environmental issues such as global warming and climate change.</p> <p>LBP: Research and explore the characteristics and working properties of materials.</p> <p>SLF: Research into the natural world. Appealing to specific target markets &amp; clients.</p> <p>MTP: Movement and mechanisms and how they are applied in existing mechanical products. Appealing to specific target markets &amp; clients.</p>
Identify and solve their own design problems and understand how to reformulate problems given to them	<p>WPP: Producing solutions for promoting environmental awareness.</p> <p>FPS &amp; PCP: Alternative solutions to using glue for joints.</p> <p>BST: Transferring measurement to an inaccessible section.</p> <p>LBP: Working to a design based on materials exploration.</p> <p>SLF: Working to a design brief for a given scenario.</p> <p>MTP: Working to a design brief for a given scenario, detailed exploration. through task analysis and formulation of a specification.</p>
Develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations	MPA & MTP: formulating a criteria-based design specification.
Use a variety of approaches [for example, biomimicry and user-centred design], to generate creative ideas and avoid stereotypical responses	<p>WPP, FPS, PCP, BST, MPA: Using theme-based research and existing products to assist with creative and original design ideas.</p> <p>LBP: Generating and developing ideas based on materials exploration.</p> <p>SLF: Generating and developing theme-based ideas.</p> <p>MTP: Generating and developing ideas based on movements and mechanisms.</p>
Develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools	<p>WPP: Typography and graphics skills are taught here.</p> <p>FPS: Graphics and colouring in skills are taught here.</p> <p>PCP: Oblique and Isometric projection.</p> <p>BST: Typography, Isometric and one-point perspective drawing.</p> <p>MPA: One and two-point perspective drawing and tonal shading.</p> <p>LBP: Sketching and rendering methods</p> <p>SLF: Using computer-based tools (CAM – laser cutter)</p> <p>MTP: Card output mechanisms. Sketching and rendering methods</p>
Select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture	<p>WPP: Timber surface preparation with hand tools and disc sander.</p> <p>FPS: CAD/CAM</p> <p>PCP: CAD/CAM and Timber surface preparation with hand tools and disc sander.</p> <p>BST: Laminating, CAD/CAM, templating.</p> <p>MPA: Laminating, machinery, templating, boring.</p>

	<p>LBP: Plastic, timber and metal skills with hand tools and machines. housing pre-built circuits safely</p> <p>SLF: CAD/CAM with 2D Design and laser cutter</p> <p>MTP: Shaping MDF &amp; reclaimed timber</p>
Select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties	<p>WPP &amp; PCP: Upcycled pallet wood.</p> <p>FPS, PCP, BST &amp; MPA: Upcycled corrugated cardboard.</p> <p>LBP: Opportunities to explore different materials and components</p>
Analyse the work of past and present professionals and others to develop and broaden their understanding	<p>FPS: Iconic graphics.</p> <p>PCP: Pop-art</p> <p>BST: Bauhaus design movement.</p> <p>MPA: Memphis design movement.</p> <p>LBP: Pre-assembled circuits</p> <p>SLF: Art Deco &amp; Art Neuveux imagery</p> <p>MTP: Researching existing mechanical toys</p>
Investigate new and emerging technologies	<p>FPS, PCP, BST, SLF &amp; MTP: CAD/CAM engraving, cutting and nesting and laser cut parts.</p>
Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups	<p>WPP, FPS, PCP, BST, MPA: Specification used throughout the projects to refine the development.</p> <p>LBP, SLF &amp; MTP: testing, evaluation and modification</p>
Understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists	<p>WPP, FPS, PCP, BST, MPA: Environmental awareness on local and wider community and globally.</p> <p>LBP: Plastic, Timber and metal source materials and sustainability discussion. soldering and ventilation, safety procedures</p> <p>SLF: Plastics and sustainability discussion; thermoplastics recycling and sustainability</p> <p>MTP: Card and paper structures and using existing mechanisms, minimising waste and re-using materials</p>
Understand and use the properties of materials and the performance of structural elements to achieve functioning solutions	<p>WPP, FPS, PCP, BST &amp; MPA: Corrugation and triangulation.</p> <p>LBP: Plastic, timber and metals. Soldering, conductivity and temperatures</p> <p>SLF: Thermoplastics, properties of thermoplastics</p> <p>MTP: Card and paper structures and working mechanisms. Movement, forces, cams and followers</p>
Understand how more advanced mechanical systems used in their products enable changes in movement and force	<p>LBP: Inputs &amp; outputs, transistors &amp; switches</p> <p>MTP: Cams, followers and linkages</p>
Understand how more advanced electrical and electronic systems can be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs]	<p>LBP: Inputs and transistors, outputs and switches</p> <p>MTP: outputs &amp; movements: discuss how mechanisms can be electrically powered with motors</p>
Apply computing and use electronics to embed intelligence in products that	<p>LBP: Choice of inputs and outputs, exploration of alternative outputs</p>

respond to inputs [for example, sensors], and control outputs [for example, actuators], using programmable components [for example, microcontrollers]

MTP: Exploration of alternative outputs and movements