A mastery curriculum for Design

	• **Core skills to be mastered**	• **Core knowledge to be mastered**
• **Year 7**	• Develop design specifications to guide their thinking. • Identify and solve design problems. • Being able to mark out with some accuracy. • Use a broad range of material joining techniques including, mechanical fastenings and adhesives. • Involve others in the testing of ideas and finished products.	• A small range of research methods. • produce ordered sequences and schedules for manufacturing products they design. • Know a range of metals and woods finishes. • How to classify materials by structure e.g. hard words, soft woods, ferrous and non-ferrous, thermoplastic and thermosetting plastics.
• **Year 8**	• Identify and solve design problems. • Use 3D CAD modelling to model ideas (2D design/google sketch up). • Being able to mark out with accuracy and select tools to do so. • Use a broad range of material joining techniques including mechanical fastenings and adhesives. • Investigate products through disassembly to determine how they are constructed and function. • How to use simple electronic circuits incorporating inputs and outputs.	• produce ordered sequences and schedules for manufacturing products they design, detailing resources required. • Know the basic properties of a range of materials leading to the pupils being able to select appropriate materials for a task. • About the physical properties of materials e.g. grain, brittleness, flexibility, elasticity, malleability and thermal. • Recognise when it is necessary to develop a new skill or technique. • Know a range of metals, polymers and woods finishes. • The positive and negative impact of a product on the wider world.
• **Year 9**	• Develop design specifications that include a wider range of requirements such as environmental, aesthetic, cost, maintenance, quality and safety. • Understand how to reformulate design problems given to them. • Use CAD models to present and test ideas – solid works – possible 3D printing. • Being able to mark out with accuracy, select tools and suggest alternative tools/methods for a task. • Use a broad range of material joining techniques including mechanical fastenings, heat processes and adhesives. • Critically testing and evaluate ideas and finished products – including short reports.	• Research the health and wellbeing, cultural, religious and socio-economic contexts of their intended users. • Plan including resources, timings, own and other's roles – possibly using Gantt charts and flow charts. • A working knowledge of the properties of a range of materials – metals, polymers and timbers. • Know a range of metals, polymers and woods finishes and be able to explain advantages and disadvantages of each. • Consider the lifecycle of a product – 'cradle to the grave'. • How to make adjustments to the settings of equipment and machinery.