‘Raising the Achievement of All’ **WELL-SEQUENCED**

KEY STAGE 3 CURRICULUM MAP **CONTEXUALISED/INCLUSIVE**

Subject: Design & Technology **AMBITIOUS**

Year:9

	Autumn 1/Spring 2	Autumn 2/Summer 1	Spring 1/Summer 2
Key Questions	• How is CAD/CAM used in industry? • What are the advantages/disadvantages of CAD/CAM • What are the examples of CAD/CAM	• What is a circuit? • What is aerodynamics and its impact on design? • What is the iterative process? • What is the role of template/model making during the designing and manufacturing process • What is engineering? • What is the iterative design process?	• What tools are used to waste metal material and to manipulate the shape? • What is a surface finish ? • Why is a surface finish applied? • Why do you need to evaluate? • How does evaluating help with the manufacturing process?
Content: ‘Know what’	• **CAD/CAM theory and 2D Design –** What CAD (Computer Aided Design) and CAM (Computer Aided Manufacture) is and examples of machines used in industry and in school (laser cutter) • **2D Design –** What is 2D Design and the different tools • **Work of others** - Investigate range of design movements and identify their style, ethos and work. Designer movements including:ART NOUVEAU ,DE STIJL, BAUHAUS, ART DECO, MEMPHIS, CONTEMPORARY • **Iterative process –** Students will know how to design and develop ideas using the iterative process. The problem area is unhealthy eating. • **Laser cut practical –** Students will manufacture their fridge magnet using the laser cutter	• **Electrical systems project** – battery powered buggy – To know what a circuit is and how to incorporate a motor, propeller, battery and switch into a system to power and race a buggy • **Metal theory -** To know the different types of metals- uses and applications (Ferrous, non-ferrous and alloys) **Practical activity - Coat hook** - Know the correct tools and equipment used to accurately mark out on metal using an orthographic drawing as reference. • **Practical activity - Coat hook** – know the correct tools and equipment and to safely cut, shape and sand mild steel. Using a range of tools and processes including: Hack saw, Junior hack saw, pillar drill, rivet gun	• **Practical activity – coat hook** – To know the properties of metal and the different applications. The method involved in cold forming mild steel. In addition, the method used to permanently and temporarily join metal together using a rivet gun is introduced. • **Surface finishes** – identify the different surface finished applied to metal for protection and aesthetical reasons. • **Evaluation** – To know the different elements to creating a detailed and constructive evaluation based on a final product
Expertise ‘Know how’	• **2D Design –** Students will be introduced to the CAD software and need to design a fridge magnet to help promote healthy eating. These tasks are teacher led and the students will use a range of tools within 2D Design. • **CAD/CAM theory-** Students are introduced into the laser cutter and example parts are shared and discussed. Watching videos and looking at live examples. • **Work of others** - Investigating the work of others is carried out through using the internet to research their work and creating mindmaps. Students will analyse their work to gain a deeper understanding using ACCESSFM and know how to incorporate their design style movement into their own work.	• **Electrical systems project** – Teacher led discussion on aerodynamics and how to create a circuit using a motor, battery, toggle switch and propeller. Students will learn by designing and making a buggy made from card-based materials. Students will test and race their design prototypes • **Metal theory - Practical activity - Coat hook** – Teacher led discussion and metal theory through powerpoints and students will read information and answer questions. Teacher led activity in the workshop demonstrating how to accurately read and interpret an orthographic drawing • **Practical activity** - Teacher led demonstration - Students manufacture their coat hook in the workshop using a range of tools, equipment and machines. Including the following: Hack saw, junior hack saw, file, vice, steel rule	• **Practical activity – coat hook** - Teacher led demonstration - Students will use the vice and former to bend their mild steel into the correct shape. Teacher led demonstration on how to use the rivet gun. • **Surface finishes** - Teacher led demonstration – students will apply the knowledge of surface finishes and apply paint to the surface of their coat hook • **Evaluation -** Students will answer set questions to help evaluate their final product
Literacy/ Numeracy/ SMSC/	• Marking and measuring out on 2D Design to create an accurate design	• Metal theory involved reading and writing. Students will need to read information and answer questions based on this • Marking and measuring is involved using the steel rule	• Marking and measuring is involved using the steel rule • Reading and answering questions for the evaluation
Disciplinary literacy	• Students read extracts based on CAD/CAM theory and summarise key points • The Tier 3 words are discussed in class • Students need to write their set-by-step instructions on their powerpoints. Explaining how they created the part for future references • Teacher led example on how to structure the writing of each step-by-step	• Being able to read and understand an orthographic drawing with measurements in order to manufacture the coat hook. • Class demonstrations by the teacher • Student involvement during practical and discussion of key tools used	• Students become critical thinkers through reading and analysing questions • Discussion on what evaluation is and its importance • What is the evaluation process • Discussing the questions
Careers	• Class discussion on career pathways linking to designing and making and problem solving • Starter activities linked to careers and work of others to show the different designers and their field of expertise	• Class discussion on career pathways linking to designing and making and problem solving • Careers in electronics and automotive industry is a focus through discussion • Starter activities linked to careers	• Class discussion on career pathways linking to designing and making with material selection • Starter activities linked to careers

*Due to the carousel, the different terms have been merged into the same column where the changeover would happen