

Quality of Education: Curriculum is planned and sequenced so that new **knowledge** and **skills** build on what has been taught before and towards its clearly defined end points.

SUBJECT: DT - Engineering		CURRICULUM PROGRESSION PATHWAYS		CL: Mr D Grimes		2021/22			
KS3 (Level 1) D&T		KS4 (Level 2) BTEC Tech Award Engineering		KS5 (Level 3) Tech-Level Engineering		Further Education / training			
<p>6-week rotations.</p> <p>Y7 Pull Along Toy Knowledge: Iterative design process, difference between hardwoods and softwoods, cams, mechanisms, types of motion. Skills: Quality control measures, cutting and shaping wood using hand tools, introduction to pillar drill and belt sander.</p> <p>Y7 Night Light Knowledge: Design process, Computer Aided Design, Electrical components, Workshop and machine health & safety, Skills: Designing for a client, soldering, CAD/CAM, finishing woods.</p> <p>Y8 Balancing Toy Knowledge: Iterative Design Process, CAD/CAM, hand tool and machine recognition, machine health and safety (lathe and pillar drill) Skills: Cutting internal and external screw threads, mechanism assembly, 2D Design, laser cutting, metal working techniques.</p> <p>Y8 Box Project Knowledge: Woods and manufactured boards, machine and workshop health and safety, tools and equipment Skills: Marking out, Cutting, shaping, refining, fitting, finishing</p>		<p>Year 9 - Bridge Year STEM project: Knowledge: Mechanical systems and structures. Engineering careers Skills: Problem Solving and teamwork</p> <p>Trophy Project: Knowledge: Iterative Design Process, CAD/CAM, metals, wood and plastic properties, hand tool and machine recognition, machine health & safety (lathe and pillar drill) Skills: Quality control and tolerances, engineering manufacturing processes (hand tools and machines), metal working on the centre lathe, 2D Design, laser cutting, drilling on the lathe and pillar drill, orthographic projections, isometric drawings.</p> <p>Mini skills project: Soft jaws, adjustable bevel Knowledge: Materials and their properties Skills: Reading engineering drawings - using tools accurately</p> <p>Stationary project: Knowledge: Iterative Design Process, manufactured boards and polymers material knowledge, CAD/CAM Skills: 2D Design, Laser Cutting, isometric drawing, orthographic projection</p> <p>Year 10 BTEC Tech Award Engineering Unit 1 LAB: Responding to a design brief (Mobile phone stand) Unit 2 LAA: Investigating Engineered products (Bike brake). Unit 2 LAB: Learning engineering through disassembly techniques (Multi tool). Unit 2 LAC: Manufacturing an engineered product (Spanner Production).</p> <p>Knowledge: Design process and iterative design Classification and working properties of Materials (metals, manufactured boards, polymers) Design and sustainability (life cycle analysis) Engineering manufacturing processes</p> <p>Skills: Manufacturing techniques / use of tools accurately and safely</p> <p>Year 11 Unit 3: Responding to an Engineered Brief Exam Part 1: Experiment Knowledge: Drawing conventions and meanings of dimensions, manufacturing processes. Skills: Interpreting data, following instructions, plotting graphs and charts, finding patterns/trends, drawing conclusions. Part 2: Redesign Knowledge: Engineering design and investigation, manufacturing processes, tools & equipment, material properties and characteristics. Skills: Design, written and mathematical communication, identifying issues with engineered products, problem solving, redesigning an engineered component, justifying choices and changes made. Drawing conventions and meanings of dimensions, manufacturing processes.</p> <p>Unit 1LAA: Engineering sectors, job roles and careers. Knowledge: Engineering sectors and disciplines, pathways into engineering, job roles within sectors, progression of roles within sectors. Skills: Research and investigation, report structure</p>		<p>Year 12: BTEC National Engineering Unit 2: Delivery of Engineering processes safely as a team. Knowledge: Manufacturing systems and processes. Material properties. Skills: Manufacture of a reading lamp using a range of tools and machines accurately and safely.</p> <p>Unit 3 Exam: Product Design and Manufacture Knowledge: Research and design Skills: Iterative design, application of material knowledge.</p> <p>Year 13: Unit 1 Exam: Engineering Principles Knowledge: Materials and Engineering Science. Applied Maths. Skills: Application of knowledge (exam) Jan - June</p> <p>Unit 10: Computer aided design for manufacture Knowledge: 2D / 3D CAD Commands. Drawing conventions. Skills: 2D, 3D Solid and 3D Shell drawing techniques.</p>		<p>Engineering Undergraduate & Postgraduate Degree</p> <p>Apprenticeships in: Aerospace automotive Broadcast civil engineering communication construction electrical energy hydraulics marine mechanic mining process engineering renewables systems engineering telecommunications transport.</p> <p>Levels intermediate advanced higher degree Post Graduates</p>		<p>Engineering Sectors Aerospace Agricultural Architecture Automotive Biomedical Chemical Civil A.I. /Robotics Drafting and Design Structural Systems Electrical Energy Renewables Technology</p>	

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