

KS4 Module 1:	KS4 Module 2:	KS4 Module 3:
<p>Knowledge <i>What pupils will know</i></p> <ul style="list-style-type: none"> • Design thinking and communication <ul style="list-style-type: none"> ○ Isometric, orthographic, one- and two-point perspective, rendering and annotation • Product analysis using ACCESSFM • Specialist techniques and processes: Timbers <ul style="list-style-type: none"> ○ Conversion ○ Seasoning ○ Laminating timbers ○ Turning ○ Wastage processes, stock forms • Specialist techniques and processes: Polymers <ul style="list-style-type: none"> ○ Processes; injection, extrusion, vacuum forming, modification, stock forms • Explore and develop design ideas • Maths in Technology 	<p>Knowledge <i>What pupils will know</i></p> <ul style="list-style-type: none"> • Advantages of using production aids during manufacture. Jigs, formers, moulds, templates • Function of electronic components • Inputs, processes and outputs • Metals. Ferrous, non-ferrous and alloys, stock forms • Textiles. Natural, synthetic, blended/mixed fibres, technical fibres, stock forms • Explore and develop final prototypes • Material properties <ul style="list-style-type: none"> ○ Tough, durable, ductile, malleable • Sustainable design <ul style="list-style-type: none"> ○ 6R's, planned obsolescence, life cycle analysis • Maths in Technology • Modern materials <ul style="list-style-type: none"> ○ Smart materials, composite materials • New and emerging technologies 	<p>Knowledge <i>What pupils will know</i></p> <ul style="list-style-type: none"> • Investigate the work of others <ul style="list-style-type: none"> ○ x2 designers, x2 design companies • Energy storage and generation <ul style="list-style-type: none"> ○ Renewable and non-renewable • Mechanical devices <ul style="list-style-type: none"> ○ Levers, linkages, CAMS and gears ○ Types of motion • Maths in technology • Anthropometrics and ergonomics • Scales of production <ul style="list-style-type: none"> ○ One off, batch, mass, continuous
<p>Skill <i>What pupils will be able to do</i></p>	<p>Skill <i>What pupils will be able to do</i></p>	<p>Skill <i>What pupils will be able to do</i></p>
<ul style="list-style-type: none"> • Identify a user and their needs and wants • How to write a design brief and specification • Identify the strengths and weaknesses of existing products • 2d and 3d CAD software • Secure knowledge and confidence to work safely in the workshop, selecting and using equipment and PPE correctly • Cutting, sawing, drilling and adhesion, deforming and reforming • Identify and justify modifications for improvements • Maths in Technology <ul style="list-style-type: none"> ○ Area, volume 	<ul style="list-style-type: none"> • Skilfully solder and produce a working circuit • How to shape and form <ul style="list-style-type: none"> ○ Metal based materials (cut, shape, drill, cast) • Identify and justify future modifications • Make informed decisions about material selection and end of life disposal • Maths in Technology <ul style="list-style-type: none"> ○ Wastage, percentages, costings • Identify the properties and uses of smart and modern materials 	<ul style="list-style-type: none"> • Analyse and evaluate the work of others. • Identify and describe the 5 forces and four types of motion • Calculate gear ratio and moments • Maths in Technology <ul style="list-style-type: none"> ○ Graphs, mean • Identify and describe ergonomic features of existing products

KS4 Module 4: Identifying and investigating design possibilities. Producing a design brief and specification	KS4 Module 5: Generating and developing design ideas	KS4 Module 6: Realising design ideas. Analysing and evaluating
<p>Knowledge <i>What pupils will know</i></p>	<p>Knowledge <i>What pupils will know</i></p>	<p>Knowledge <i>What pupils will know</i></p>
<ul style="list-style-type: none"> • How to analyse and evaluate a context or problem • Primary and secondary research <ul style="list-style-type: none"> ○ Market research (surveys and questionnaires) ○ Discover needs and wants of a user • Conduct a product analysis using ACCESSFM • Create a design brief and specification • Further research <ul style="list-style-type: none"> ○ Anthropometric data and ergonomics ○ Materials and their properties ○ Joining and finishing techniques • Social, sustainable, economic effects 	<ul style="list-style-type: none"> • How the work of others informs design ideas • The advantages and disadvantages 2d and 3d CAD • Different design strategies <ul style="list-style-type: none"> ○ Isometric ○ Perspective ○ Modelling ○ Rendering and annotation • Principles of engineered drawings <ul style="list-style-type: none"> ○ Orthographic projection • Joining methods and commercial production processes • Iterative process, continuous improvement, testing and client feedback 	<ul style="list-style-type: none"> • Specialist techniques and processes • Safe working practices • Quality control • Tolerances • Materials and component selection • Properties of materials • Why materials need a surface treatment • Analysis and evaluation <ul style="list-style-type: none"> ○ Test prototype against design specification • Commercial production processes
<p>Skill <i>What pupils will be able to do</i></p>	<p>Skill <i>What pupils will be able to do</i></p>	<p>Skill <i>What pupils will be able to do</i></p>
<ul style="list-style-type: none"> • Perform a task analysis of a problem <ul style="list-style-type: none"> ○ Identify a possible design opportunity/ problem • Record findings from research using charts, such as pie/ bar. • Identify strengths and weaknesses of existing products, record findings. • Summarise and apply research in order to create a design brief and specification that links to the needs and wants of their user. • Consider the wider responsibilities of a designer 	<ul style="list-style-type: none"> • Apply features from the work of others to create innovative design ideas. • Take risks with designs and demonstrate flair and originality. • Independently operate 2d and 3d CAD software • Be able to produce isometric, one- & two-point perspective drawings, card models • Create a manufacturing specification <ul style="list-style-type: none"> ○ Orthographic drawing ○ Cutting and material list • Experiment and test a range of joining, shaping methods and production processes • Test designs and models against design specification <ul style="list-style-type: none"> ○ Take on board and apply client feedback to develop and modify ideas 	<ul style="list-style-type: none"> • Following health and safety procedures <ul style="list-style-type: none"> ○ Select correct PPE ○ Use tools, equipment and machinery safely and independently • Independently and correctly set up and CAM equipment • Apply quality control during manufacture <ul style="list-style-type: none"> ○ Tolerances ○ Flow charts ○ Dairy of making • Collect user and client feedback • Identify and justify modifications for commercial manufacture