CURRICULUM PLAN

RESISTANT MATERIALS

BRAMHALL HIGH SCHOOL

Curriculum Intent

YEAR 7
DMA projects that help students to develop the skills, knowledge and understanding to design and make high quality 3D products and to communicate their design journey.

YEAR 8
DMA projects that help students to develop the skills, knowledge and understanding to design and make high quality 3D products and to communicate their design journey.

YEAR 9
DMA projects that help students to develop the skills, knowledge and understanding to design and make high quality 3D products and to communicate their design journey.

YEAR 10
DMA projects that help students to develop the skills, knowledge and understanding to design and make high quality 3D products and to communicate their design journey.

YEAR 11
DMA projects that help students to develop the skills, knowledge and understanding to design and make high quality 3D products and to communicate their design journey.

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YEAR 7

Term	Programme of Learning	Links to the National Curriculum / Specification / Additional	Assessments	What extra learning opportunities are planned?	Disciplinary Literacy
Yr 7 students remain in a D&T subject for 12 weeks. Yr7 students rotate around all D&T subjects – 3 rotations in Yr7 and 2 in Yr8	Students design and make a personalised desk tidy for an identified target market. They make the product to set dimensions and design he cover and CAM from their own design and research tasks ***(learning & developing)*** **Skills, Knowledge and Understanding** Creation of folders Target market and mood board Desk Tidy Research & analysis – specification Selection of images from the internet Downloading from VLE	A = AIMS D = Design M = Make E = Evaluate T = Technical Knowledge A1, A2, A3, D1, D2, D3, M1, M2, E3	See assessment planning • Mood board • Target Market • Specification • Initial and developed Ideas • Making • Evaluation	Development of CAD work and use of CAM using 7 tutorials	Medium density fibreboard Birch Plywood Pine Softwood Coniferous Deciduous Thermo Plastic Acrylic Finger joint Poly Vinyl Acetate Client Vector Bitmap Specification Manufacturing Ideas Evaluation

	Conversion of simple images to bitmaps Cad – 2d design Editing – 2d design Size and measurement – 2 d design Use of CAD & CAM Use of hand tools and machines Vector and bitmap awareness Workshop basic safety Downloading simple backgrounds Simplistic experimentation with layout Creation of final product Evaluation against design criteria				

YEAR 8

Term	Programme of Learning	Links to the National Curriculum / Specification / Additional	Assessments	What extra learning opportunities are planned?	Disciplinary Literacy
Yr 7 students remain in a D&T subject for 12 weeks. Yr7 students rotate around all D&T subjects – 3 rotations in Yr7 and 2 in Yr8	Students make an individually proportioned phone chair with accessible charging conduit out of wood and plastic creating a working drawing and using templates for the final net. Practical skills are enhanced using tools and techniques already taught on the Y7 project building necessary knowledge. New techniques and machines are introduced with more complex joints components being used. Understanding and analysing working drawings Meeting set deadlines Planning time effectively Use of CAD Independently selecting	A = AIMS D = Design M = Make E = Evaluate T = Technical Knowledge A1, A2, D2, D3, M1, M2, E2, T1	See assessment planning • Research into existing products • Creation of working drawing and template using mathematics • New techniques cutting and finish plastic • Cross halving joints • Finishing techniques for wood • Final product	Use of 2D design to create isometric and orthographic drawing	Hardwood Mahogany Teak Beech Birch Halving joint Conduit Template Orthographic Polyvinylchloride Dimensions Acrylic Polyurethane Varnish

	tools and equipment Independently working from a design drawing Independently modifying designs where necessary Utilisation of a working drawing Independently hand drawing isometric projection of the design mastery Creation of final product Creativity and originality				

YEAR 9

Term	Programme of Learning	Links to the National Curriculum / Specification / Additional	Assessments	What extra learning opportunities are planned?	Disciplinary Literacy
Y9 pupils remain in a D&T subject for 18 weeks. Students then rotate 2 or 3 rotations dependent upon staffing/option popularity and group size.	Students create a working key hook to carry one key, and design and make a key fob from casting. The material focus of the project is woods and metals. Pupils are to investigate the different types of woods and metals, their associated families and identify properties to a select common metal/wood. Pupils will investigate ways to shape metal. The practical focus will be Low Temperature casting where pupil will design the Mold for their key fob on 'Techsoft'and cast using pewter. Pupils will make use of skills previously taught in Design Technology to produce a wooden	A = AIMS D = Design M = Make E = Evaluate T = Technical Knowledge A1, A2, D1, D5, M1, M2, E2, T1,T3	See assessment planning • Analysis of context • Research of metals. Ways to shape and join metals • Research woods and their properties • Design specification • Modelling and development and orthographic projection • Making • Evaluation	A series of skills, knowledge and understanding lessons support the projects. Students rotate round and experience a bespoke programme where they learn essential elements for their examination.	Dowel Shaft Casting Alloy Steal Aluminium Pewter Orthographic Extrusion Stock forms Pine Scale Tolerance

	surround for the key fob – follow a set of manufacturing instructions to make the surround resemble a house. The product is then evaluated against the design specification, orthographic working drawing and as a manufacturer. Working as an individual Select design theme exceeding set deadlines Independent creation of folders Planning time effectively to utilise lesson and home tasks Problem & design brief mastery Target market mastery Metals Research & analysis – specification mastery Use of VLE for independent study Design and working drawing creation mastery Use of CAD & CAM mastery				

	Independently selecting tools and equipment mastery Independently working from a design drawing mastery Independently modifying designs where necessary mastery Vector and bitmap understanding & mastery Background experimentation and innovation Utilisation of an orthographic working drawing mastery Experimentation & layout mastery Creation of final layouts – apply criteria Creation of final products Independent creativity and originality. Evaluation against design criteria Hand skills mastery classes				

CURRICULUM PLAN – RESISTANT MATERIALS

YEAR 10

Term 1a	Skills project. Students create a wooden box using a range of wood joints and a dongle made from thermoforming plastic or pewter using a range of tools and equipment safely and skilfully. They will investigate health and safety, use of tools and equipment, families of woods/timbers and metals; and quality control/assurance. The product will then be evaluated against the design specification.	3.1.3-Smart, modern and composite materials 3.1.1 – Sustainability. 3.2.3 Ecological and social footprint 3.2.4 sources and origins of materials 3.2.6 stock forms of timbers and metals3.2.8 specialist techniques and processes-wastage, addition, deforming and reforming 3.2.8 quality control 3.2.9 surface treatments and finishes-timbers 3.1.1 – Production techniques and systems 3.1.6.1 Material categories-natural and manufactured timbers, metals and alloys. 3.2.5 – Using and working with materials - How to shape and form using cutting, abrasion and addition	See assessment planning Context Analysis Target market profiling, Cam movement research, Design specification, Initial ideas, Modelling and development and orthographic projection, Making, Evaluation	Pupils are also introduced to 2D Design software (Techsoft) and 3D Design [Sketch-Up] they will learn the basics of the software and how to produce decoration and a final drawing of their box using the software. Instructions provided on how to use software to print out on a 3D printer where relevant.	Analysis Context Client

		3.2.8 Specialist techniques and processes 3.3.2 Types of drawing- orthographic, one-point/two-point perspective, isometric, exploded view.			
Term 1b	**Modelling Project** Students will use a range of modelling techniques- clay, foam, paper and card, MDF, laser cutting to create a model of a hand-held device/golf game. Students will investigate existing products and model their own design.	3.3.4Modelling	MOCK 1 – Students sit a full GCSE	Confidence in using a range of different materials to model aspects of their prototype design.	Folding Perforation Shearing Moulding Wedging Maquette Prototype
Term 2A/B	**Lamp research, design and make task.** Students are given a mini project that focusses on the research aspects of the NEA after being given the task wording "Lighting solution that reflects influence of a designer or design movement." They will then design, develop through	3.1.1 society, culture, people 3.1.4 System- input/process/output 3.2.7 Scales of production 3.3.3 'The Work of Others' 3.3.4 Explore and develop their own ideas 3.3.5 communication of ideas 3.3.6 prototype development	MOCK 2 – Students sit a full GCSE Mock Exam. *(students are supported with the theme and are prepared within lessons)* Complete folder linked to NEA	Appreciation of a range of existing designers and companies that might influence their further work.	Aesthetics Function ACCESS FM Design development Inspiration

	modelling and make the product under guidance. They will use a range of materials including wood, metal, thermo-plastics and circuits to create the lamp. They will investigate shaping, forming and finishing processes/techniques for plastics and metal.				
Term 3a	**Football game design and make task.** Focus on making a high quality football game from softwoods, manufactured boards, papers, boards and 3D printed polymers.	3.1.5 Mechanical Devices 3.2.7 Scales of production 3.3.8 Tolerances 3.3.9 Material management 3.3.11 Surface treatments and finishes	PRODUCT EMPHASIS – NOT FOLDERWORK Assessing practical tasks – 3D products created	3D Printing of players Photoshops skills used in decoration of the game	3D planning activities Orthographic drawing Manufacturing specification

Term 3b	**GCSE PROJECT THEMES ARE RELEASED BY AQA** Students are made aware of the dept. limitations for their NEA projects. **NEA/CONTROLLED ASSESSMENT STARTS**		Projects negotiated and deadlines agreed before summer break. 4 A3 pages min requirement		

YEAR 11					
Term	**Programme of Learning**	**Links to the National Curriculum / Specification / Additional**	**Assessments**	**What extra learning opportunities are planned?**	**Disciplinary Literacy**
Term 1a	NEA/CONTROLLED ASSESSMENT		MOCK 3 – Students sit a full GCSE Mock Exam. *(students are supported with the theme and are prepared within lessons)* Mock feedback session		
Term 1b	NEA/CONTROLLED ASSESSMENT		MOCK 3 – Students sit a full GCSE Mock Exam. *(students are supported with the theme and are prepared within lessons)* Mock feedback session		

Term 2a	NEA/CONTROLLED ASSESSMENT		MOCK 3 – Students sit a full GCSE Mock Exam. *(students are supported with the theme and are prepared within lessons)* Mock feedback session		
Term 2b	Submission of Controlled Assessment. Half term				

Term 3a	Yr11 have tailored revision lessons to prepare them for their exam whilst exploring gaps in learning. Boosters planned and delivered to prepare students.				
Term 3b					