

Curriculum Map: 3D Studies KS3 23-24						
	YEAR 7		YEAR 8		YEAR 9	
	Block bot project		Coral phone case		'No planet B'- Birdbox project	
Topic	Design and Make	Make and Evaluate	Design and Make	Make and Evaluate	Design and Make	Make and Evaluate
Intent	The project in Year 7 allows students to build on skills learned in the Mechanisms curriculum at KS2 and introduces a range of knowledge, understanding and skills. Students will design and make high-quality prototypes and a final product (block robot) to meet a specification and specific application. Students will critique and evaluate the work of themselves and others and will test their ideas and products using feedback, to enhance their work.		The project in Year 8 allows students to build on skills learned in Year 8 and introduces and refines a range of knowledge, understanding and skills. Students will design and make high-quality prototypes and a final product (phone case and stand) to meet a specification and specific applications. Students will critique and evaluate the work of themselves and others and will test their ideas and products using feedback, to enhance their work.		The project in Year 9 allows students to build on skills learned in Year 8 and introduces, refines, and embeds a range of knowledge, understanding and skills. Students will design and make high-quality prototypes and a final product (Birdbox) to meet a specification and specific application. Students will critique and evaluate the work of themselves and others and will test their ideas and products using feedback, to enhance their work.	
Start point	All students will have some experience of the DT Mechanisms curriculum at KS2. Students in our feeder primary schools experience how to design, make and evaluate products with some understanding of electrical circuits.		Students will understand the Design, Make and Evaluate process. They know how to use a design brief to inspire the creation of a new product. They will be competent in a range of skills such as marking and measuring and the use of other tools and equipment. They know how to use feedback and work of others to begin to reflect on this design process to inform their evaluations.		Students will understand the Design, Make and Evaluate process in more depth. They know how to use a design brief to inspire the creation of a new product. They will be highly competent in a range of skills such as C.A.D and the use of other tools and equipment. They know how to use feedback and work of others to inform the evaluation and re-design process.	
Key Knowledge	To know and understand how to research and use research, develop part of a specification, develop, and communicate design ideas using annotated sketches, select and use specialist tools (saws, pillar drill, belt sander, conductive wires, resistors, batteries).	To know and understand how to analyse the work of others (Keith Haring, Joseph Engelberger 'the inventor of robots), some applications of AI and robots, test, evaluate and refine their ideas against their specification considering the views of the intended users.	To know and understand how to research and use research, identify, and solve a design problem, develop a specification, develop, and communicate design ideas using modelling, digital presentations, computer software, select and use specialist tools (card, sublimation paper, heat press, acrylic),	To know and understand how to analyse the work of others (phone case brands: Pela, Wake Lifeproof), test, evaluate and refine their ideas against their specification considering the views of the intended users. To understand how developments in Technology such as drones, autonomous underwater vehicles (AUVs) can support coral conservation.	To know and understand how to research and use research to explore ideas, identify, and solve a design problem, develop a specification which informs their design. To use biomimicry as a design approach. Develop, and communicate design ideas using sketches, modelling, detailed plans, digital presentations, computer software, select and use specialist tools (wood, plastic, solar panel, conductive wires, resistor, capacitor etc.).	To know and understand how to analyse the work of others (Theresa Bromski), test, evaluate and refine their ideas against their specification considering the views of the intended users. To understand the responsibilities of designers, engineers and technologists towards society.
Key Technical Knowledge	To understand and use the properties of different types of wood and electronic circuits to achieve a fully functioning solution. To understand how electronic systems can be powered and how their circuit can be enhanced if further developed.		To understand and use the performance of structural elements to achieve a fully functioning solution. To apply CAD skills in the design process. To apply computing skills to further develop the design to become SMART in the evaluation process.		To understand and use properties of different types and electronic circuits and solar panels to achieve a fully functioning solution. To understand how advanced mechanical systems enable changes in movement and force. To understand how electronic systems can be powered and how their circuit can be enhanced if further developed.	
Key Skills	Work safely, demonstrate how to mark out and measure wood, use a range of hand tools and machinery in order to cut and finish wood accurately, know how to create a working electric circuit to power L.E.D lights and to add surface design for aesthetics.		Work safely, demonstrate how to use the heat press, mark out and measure acrylic, use the strip heater, use a range of hand tools and machinery in order to finish plastic accurately.		Work safely, demonstrate how to mark out and measure wood and a range of other materials, use a range of hand tools and machinery in order to cut and finish materials accurately, know how to create a working electric circuit to power L.E.D lights/ solar panels with controls.	
Misconceptions and adaptive strategies	Misconception: electronics terminology/ how to create a circuit. Strategy: build in opportunities for terminology to be discussed at the start of the project so that students use 'prior learning' when they undertake the practical element on circuits.		Misconception: why discussions around sustainability are important i.e. coral conservation/ sustainable materials. Strategy: discuss the bigger picture and relate to student context throughout the project i.e. waste on a global and personal scale.		Misconception: electronics terminology/ how to create a circuit. Strategy: build in opportunities for terminology to be discussed at the start of the project so that students use 'prior learning' when they undertake the practical element on circuits.	
Key Vocabulary	Tier 2: design, make, evaluate, analyse, application, critique, feedback, annotate Tier 3: research, specification, designer, consumer, prototype, tenon saw, sandpaper, band facer, pillar drill, conductive wire, resistor switch, battery, circuit, artificial intelligence BBEC values in context.		Tier 2: design, make, evaluate, analyse, application, critique, feedback, digital Tier 3: research, specification, designer, consumer, prototype, heat press, sublimation, strip heater, acrylic, band facer, pillar drill, CAD, CAM, drones, AUV BBEC values in context.		Tier 2: design, make, evaluate, analyse, application, critique, feedback, digital, mechanical, environment, sustainable Tier 3: research, specification, designer, consumer, prototype, biomimicry, solar panel, CAD, CAM, BBEC values in context.	
Key Reading	Artist/designer research: Joseph Engelberger- https://www.automate.org/a3-content/joseph-engelberger-about Keith Haring https://www.britannica.com/biography/Keith-Haring Exploring Design and Technology at KS3 textbook- Chapters 1 (designing and making principles),2 (using and working with materials),3 (electronic and mechanical systems)		Artist/designer research: Pela: https://uk.pelacase.com/ Otterbox: WAKE LIFEPROOF https://www.otterbox.com/en-us/wake-series-recycled-cases Exploring Design and Technology at KS3 textbook- Chapters 1 (designing and making principles),2 (using and working with materials),3 (electronic and mechanical systems)		Artist/designer research: https://toolbox.biomimicry.org/ https://www.renewableenergyhub.co.uk/main/solar-panels/how-do-solar-panels-work-for-kids#:~:text=The%20sun%20shines%20on%20the,the%20appliances%20in%20your%20home Theresa Bromski: https://www.theresagromskistudio.com/brandwork Exploring Design and Technology at KS3 textbook- Chapters 1 (designing and making principles),2 (using and working with materials),3 (electronic and mechanical systems)	
End Point	At the end of half term 1, students will have a thorough understanding of how their learning in KS2 links to the project. They will begin to understand how the design and make process are interlinked. They will be competent in marking and measuring and the use of tools and equipment.	At the end of half term 2, students will have a clear understanding of how their specification and design and make process are interlinked. They will use feedback and work of others to begin to reflect and think critically on this design process to inform their evaluations. They will be competent in use of tools and equipment and will have a viable end product.	At the end of half term 1, students will have a thorough understanding of how their learning in Year 7 about the design, make and evaluate process builds the foundation for this project. They will begin to be competent in the use of CAD and the use of specific tools and equipment such as the heat press, strip heater and a range of hand finishing tools.	At the end of half term 2, students will critically compare their specification, design and finished product. They will use feedback and work of others to reflect which will inform their evaluations. They will be competent in use of tools and equipment and will have a viable product. They will use feedback to begin to model alternative products i.e., more sustainable, using other recyclable materials, through testing.	At the end of half term 1, students will have a thorough understanding of how their learning in Year 8 about the design, make and evaluate process builds the foundation for this project. They will begin to be competently use a range of design processes to create non-stereotypical design ideas. They will embed their knowledge of and the use of specific tools and equipment including hand tools and machinery.	At the end of half term 2, students will critically compare their specification, design and finished product. They will use feedback and work of others to reflect which will inform their evaluations. They will be competent in use of tools and equipment and will have a viable end product. They will use feedback to begin to model alternative products i.e. more sustainable, using other recyclable materials, through testing.
Form of Assessment	Formative assessment throughout lesson activities, whole-class feedback sheets, peer/self-assessment allocated to specific booklet tasks. Summative assessment 1: specification and design ideas.	Formative assessment throughout lesson activities, whole-class feedback sheets, peer/self-assessment allocated to specific booklet tasks. Summative assessment 2: practical outcome and product evaluation.	Formative assessment throughout lesson activities, whole-class feedback sheets, peer/self-assessment allocated to specific booklet tasks. Summative assessment 1: specification and design ideas.	Formative assessment throughout lesson activities, whole-class feedback sheets, peer/self-assessment allocated to specific booklet tasks. Summative assessment 2: practical outcome and product evaluation.	Formative assessment throughout lesson activities, whole-class feedback sheets, peer/self-assessment allocated to specific booklet tasks. Summative assessment 1: specification and design ideas.	Formative assessment throughout lesson activities, whole-class feedback sheets, peer/self-assessment allocated to specific booklet tasks. Summative assessment 2: practical outcome and product evaluation.
Enrichment opportunities	Homework tasks set every 3 weeks to support the learning in lesson. Opportunity to link learning to Bradford 2025 and contextualise knowledge.		Homework tasks set every 3 weeks to support the learning in lesson. Opportunity to link learning to Bradford 2025 and contextualise knowledge.		Homework tasks set every 3 weeks to support the learning in lesson. Opportunity to link learning to Bradford 2025 and contextualise knowledge.	
Leadership opportunities	Opportunities to lead aspects of the lesson (practical demonstrations), show BBEC values through supporting other with practical skills, leading presentation and groupwork.		Opportunities to lead aspects of the lesson (practical demonstrations), show BBEC values through supporting other with practical skills, leading presentation and groupwork.		Opportunities to lead aspects of the lesson (practical demonstrations), show BBEC values through supporting other with practical skills, leading presentation and groupwork.	