Subject overview:KS4- Design & Technology

Subject Rationale (Intent) linked to whole school curriculum mission

Design and technology prepares students to participate in tomorrow's rapidly changing technologies. They will learn to be curious thinkers and intervene creatively to improve quality of life. The subject calls for students to become autonomous and creative problem solvers, as individuals and members of teams.

Additional details

We believe secondary art and design builds on the skills and knowledge pupils have already learnt at primary school. It leverages increasingly sophisticated resources, including dedicated teaching environments, manufacturing equipment and specialist teaching. As students' progress through this phase, they may be given the opportunity to focus on specific aspects of the subject such as art, product design, food technology and engineering, with its core always encompassed around creativity and imagination. Over the year, students will build their confidence in using such machines and techniques to take forward into their own independent learning.

The key aim is to help students learn to design and make products that solve genuine, relevant problems within different contexts whilst considering their own and others' needs, wants and values, and enabling students in making links through transferable skills in other subjects. To do this effectively, they will acquire a broad range of subject knowledge and draw on additional disciplines such as mathematics, science, engineering, computing and art.

YEAR 10			
TERM	**Topic sequence** **(What are you teaching?)**	**Topic sequence rationale** **(Why are you teaching this? How does it link to prior learning? Any notable links to St Edmund's curriculum mission**	**Main method of assessment?**
Term 1:1	Students will be introduced to the course and be given a mock coursework task to complete. They will also do weekly theory tasks on exam content. ● Mind map - Identify criteria based around contextual challenge and ACCESSFM ● Moodboard - Collection of images to give inspiration based on existing products, materials, inspirational design and ergonomics and environment. ● Research into work of others - Researching and analysing existing products based on ACCESSFM ● Disassembly - How products are made, looking at different parts,what processes are used and the environmental impact. ● Design Specification - use ACCESSFM to list needs and wants for their product and also evidence where it can be found. ● Theory Unit 1: New and Emerging Technologies ● End of Unit Assessment	Students are given a mock NEA to give them an idea of what is to be expected in Year 11. Students will only cover some of the criteria so that they understand the level of expectations. They will be able to use some of the content in Year 11 with the official contextual challenges. Students will develop technical language and terminology to be able to produce high quality work. The research tasks will encourage students to find an actual client and work around their needs in line with how an actual engineer/designer would work with a client to develop a new product. Students will understand and use past knowledge from KS3 to complete tasks including the use of ACCESSFM to research/analyse and develop specifications. Students will also be completing theory in preparation for Year 11 assessment and mocks in Year10 Each unit has worksheets which they complete and as a class we mark and add improved answers where required. Teacher double checks any answers End of unit assessment is completed under test conditions.	Students will be given verbal feedback and written feedback on their NEA, this will include a mark out of 10. With CTGs they will be able to reflect on their work and make improvements, DIRT time given to make improvements in lessons and at home. Theory marking is done live in class with work swapping and adding correct answers as given by the teacher, discussion on the answers and the method to get to the answer.
Term 1:2	Students will start to look at design ideas for their mock contextual challenge. Students will be introduced to thumbnails and isometric, 1 and 2 point perspectives. Students will also be	Students will use a range of modelling techniques to develop ideas this is to give them as much variety in their approach to coming up with ideas for their mock product. This will allow those who struggle to design by pencil to look at other mediums for designing including	Students will be given verbal feedback and written feedback on

	introduced to CAD drawing techniques Students do some practice drawing techniques prior to producing initial ideas ● 10 initial thumbnails, hand drawn, rendered and labelled ● 2 developed ideas drawing in 2 different techniques ● Use of CAD software, either Fusion or SketchUp to produce final design ● Paper/ Plasticine Modelling ● Unit 2: Energy, Materials Systems and Devices ● End of Unit Assessment	modelling with plasticine. Students will be reshown drawing techniques learnt in Year 9 in 3D design to produce ideas. Students will also refer to skills learnt in Year 7/8/9 in relation to CAD and also be introduced to industry standard software - Fusion. Students will also be completing theory in preparation for Year 11 assessment and mocks in Year10 Each unit has worksheets which they complete and as a class we mark and add improved answers where required. Teacher double checks any answers End of unit assessment is completed under test conditions.	their NEA, this will include a mark out of 10. With CTGs they will be able to reflect on their work and make improvements, DIRT time given to make improvements in lessons and at home. Theory marking is done live in class with work swapping and adding correct answers as given by the teacher, discussion on the answers and the method to get to the answer.
Term 2:1 **Term 2:2**	Students to manufacture prototype using range of tools and materials. Use CAD/CAM and traditional tools. ● Storyboard - log of making ● Unit 3: Materials and their working properties ● End of Unit Assessment ● Unit 4: Common specialist technical principals ● End of Unit Assessment	In this term students will be shown processes for manufacturing parts of their mock product. This will include Lasering/3D Printing as well as referring to hand tools/ machines and techniques learnt in KS3. Students will keep a log of their making in the form of a Storyboard - they will be able to use this in parts in their official contextual challenge. Where appropriate students will also be shown how to use lathes and millers. Students will be expected to programme and manufacture independently. Students will also be completing theory in preparation for Year 11 assessment and mocks in Year10 Each unit has worksheets which they complete and as a class we mark and add improved answers where required. Teacher double checks any answers End of unit assessment is completed under test conditions.	Students will be given verbal feedback and written feedback on their NEA, this will include a mark out of 10. With CTGs they will be able to reflect on their work and make improvements, DIRT time given to make improvements in lessons and at

			home. Theory marking is done live in class with work swapping and adding correct answers as given by the teacher, discussion on the answers and the method to get to the answer.
Term 3:1	Students evaluate their project and test against specification. ● Unit 5B: Timber based materials ● End of Unit Assessment	Once the product is completed they will be expected to evaluate their product against their specification. This is so that they are self reflective and identifying areas where they have not met their criteria and then looking at reasons why and if this makes their product successful or not. Students will also be completing theory in preparation for Year 11 assessment and mocks in Year10 Each unit has worksheets which they complete and as a class we mark and add improved answers where required. Teacher double checks any answers End of unit assessment is completed under test conditions.	Students will be given verbal feedback and written feedback on their NEA, this will include a mark out of 10. With CTGs they will be able to reflect on their work and make improvements, DIRT time given to make improvements in lessons and at home. Theory marking is done live in class with work swapping and adding correct answers as given by the teacher, discussion on the answers and the method to get to the answer.

Term 3:2	Introduction to official Contextual Challenge and expectations of the NEA Students produce 3 moodboards, 1 for each contextual challenge. Before selecting one to take forward as their final project. ● Unit 5D: Polymers ● End of Unit Assessment	Students will begin their official Contextual challenge, given by the Exam board. This will require them to pick one, but to ensure they fully understand each challenge, they will be given a moodboard task to identify key aspects of each before selecting their challenge to take forward. Students will also be completing theory in preparation for Year 11 assessment and mocks in Year10 Each unit has worksheets which they complete and as a class we mark and add improved answers where required. Teacher double checks any answers End of unit assessment is completed under test conditions.	Students will be given verbal feedback and written feedback on their NEA, this will include a mark out of 10. With CTGs they will be able to reflect on their work and make improvements, DIRT time given to make improvements in lessons and at home. Theory marking is done live in class with work swapping and adding correct answers as given by the teacher, discussion on the answers and the method to get to the answer.

YEAR 11			
TERM	**Topic sequence** **(What are you teaching?)**	**Topic sequence rationale** **(Why are you teaching this? How does it link to prior learning? Any notable links to St Edmund's curriculum mission**	**Main method of assessment?**
Term 1:1	Students will start AO1: Producing a design brief & specification: ● Identify the problem & Design Brief	Students will refer back to Year 10 and utilise any information that can be used within their course work. Students will start to research key criteria which will help them to develop their product. Students will	Students will be given verbal feedback and

Term 1:2	• Project Mind map - identify key criteria for project and research • Research existing products • Client Profile & Interview and Target Market Identification • Specific Project related research - ergonomics, Environment considerations, disassembly • Market research and feedback • Research Analysis • Specification • Unit 6: Designing Principles • End of Unit Assessment Students will start AO2: Identify, investigate & outline design possibilities • Design ideas generation with client feedback on designs • Modelling ideas - using paper, card and plasticine • Development of design ideas using a range of drawing techniques including CAD - SketchUp & Fusion 360 • Final design - hand drawn or CAD • Materials and processes investigation • Manufacturing specification - cutting list and materials needed • Unit 7: Making Principles • End of Unit Assessment	need to know they client and have regular communication to get their feedback Learners will need to evaluate across each research task to identify what the next step is and justify their decision. In addition to the normal research tasks identified, they will also need to undertake additional research task to gain a deeper understanding of all potential factors a designer would need to consider in the designing process. Referencing what was learnt in Year 10 in relation to designing, students will develop a range of design which will meet the specification criteria. In addition to this students will need to model and refine their design using computers to superimpose their improvements over if required. CAD skills will be utilised to enhance designs. Students will also be completing theory in preparation for Year 11 assessment and mocks in Year 11 Each unit has worksheets which they complete and as a class we mark and add improved answers where required. Teacher double checks any answers End of unit assessment is completed under test conditions.	written feedback on their NEA, this will include a mark out of 10. With CTGs they will be able to reflect on their work and make improvements, DIRT time given to make improvements in lessons and at home. Theory marking is done live in class with work swapping and adding correct answers as given by the teacher, discussion on the answers and the method to get to the answer.
Term 2:1 **Term 2:2**	Students will start the final practical prototype using materials identified in the Manufacturing specification. • Storyboard/ making diary with description of process and health and safety consideration • Flow chart - select once process and describe the process of manufacturing	Students will begin to manufacture their prototype, this can be a non functioning prototype. Students will be expected to use a range of materials, tools, equipment and processes to manufacture the prototype. To further enhance their understanding of processes, students will need to produce a flow diagram which will allow them to consider the individual stages of manufacturing a specific component. This will give them a deeper understanding of QC checks needed in the	Students will be given verbal feedback and written feedback on their NEA, this will include a mark out of 10. With CTGs they will

	components. ● Finished non working prototype Students will start A03: Analyse and Evaluate Students will be analysing and evaluating throughout the project but in this section they will: ● Test against specification ● Technical testing - checking functionality ● Customer/client testing ● Produce a redeveloped design to meet the needs of any modifications/improvements.	manufacturing of components and products. Although students analyse and evaluate throughout the project they will also be testing against the specification as well as getting client feedback to give them an insight in the design process and finally suggesting and making further developments of their final prototype. Students will also be completing theory in preparation for Year 11 assessment and mocks in Year 11 Each unit has worksheets which they complete and as a class we mark and add improved answers where required. Teacher double checks any answers End of unit assessment is completed under test conditions.	be able to reflect on their work and make improvements, DIRT time given to make improvements in lessons and at home. Theory marking is done live in class with work swapping and adding correct answers as given by the teacher, discussion on the answers and the method to get to the answer.
Term 3:1 **Term 3:2**	Students will be doing exam based revision - including: ● Live assessment - given a question and then a work through the answer as the examiner would want it ● Past paper practice ● Exam question and then research task using internet to find answer Complete Final Exam Assessment	Students will be doing a variety of preparation techniques for their exam. This will include live assessment where the answers will be walked through - looking at the examiners report and feedback commentary. Past papers to gain an understanding of the format of questions and how to tackle the higher mark questions. Giving students a questions and then allowing them to use the internet to find the best answer and sharing it with the group.	Students will be given verbal feedback and written feedback on theory. Theory marking is done live in class with work swapping and adding correct answers as given by the teacher, discussion on the answers and the method to get to the answer.