Subject overview: KS3- 3D Design (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 7			
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?**
UNIT 1	**Foundation Drawing Skills** Students will be introduced to a number of 2D and 3D drawing techniques as well as rendering and graphic skills to give them a solid foundation that they can develop in all ADT areas each year. ● Graphic and font Design ● Paper sizes and types ● Rendering with Pencil Crayons ● Thick and thin lines ● Oblique Drawing ● Isometric Drawing	At the start of year 7 Students are at various different abilities with their drawing skills and would have been taught limited drawing techniques at KS2. This project gets all students to learn these skills and use them in practical ways. Students will be able to transfer these skills to not only the other ADT subjects but across the whole curriculum throughout their school life. Students then complete a design taks where they will use a variety of skills they have learnt over the rotation and apply to the design task. Students also learn basics of health and safety with a practical setting learning how to use basic hand tools such as a craft knife. Allowing them to become more independent in further years. Student will learn a wide range of subject specific vocabulary	Class work Homework Halfway and end of project Tests Summative and Formative Teacher assessments Close the Gap (CTG) Peer and self assessment and
UNIT 2	**Foundation Practical and CAD skills** Students are to make three cubeecraft products: ● One by hand ● One on sketch up ● One using techsoft. Students will then compare the three versions and evaluate the positives and negatives of each one.	The second part of this project focuses on more practical elements to design and technology. Students will create small card models of their product recalling the skills they learnt during the previous rotation. Students will also be introduced to Sketch up and Techsoft. where they will learn basic tools and applications of the programs to create CAD (Computer Aided Design) versions of their product. This mimics what designers would do in industry. Students get a chance to discuss the benefits of CAD over traditional methods of drawing and designing. These CAD skills allow students to become more independent with these programs as they progress through their school life and are essential if they decide to continue with ADT at GCSE level. Students then get to print out their CAD designs. and compare the 3 versions of their product looking at how CAD/CAM and traditional methods differ and the benefits and drawbacks of both. This will allow students to make informed decisions in later projects.	Final products and evaluation Summative and Formative Teacher assessments Close the Gap (CTG)

YEAR 8			
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?**
UNIT 1	**Chocolate box design project** Students will have an understanding of: ● 2D drawing skills ● Net building and card construction ● Product packaging design analysis using ACCESS FM ● Typography ● Design skills using Adobe Photoshop ● Isometric drawing ● CAD - Techsoft 2D Design ● CAM - Vacuum Forming process ● Thermoplastics	The project will introduce students to product design and how design skills can inform packaging for products that we see everyday. This project will build on skills developed from year 7 such as net building and construction, 2D and 3D drawing skills, rendering and computer based design work. Students will have the chance to create a design for a new chocolate product using hand based design drawing skills as well as creating a prototype model using software such as Techsoft 2D design and Adobe Photoshop. Students will build on net construction skills from year 7 with increasing complexity and create a plastic insert for their chocolate box using vacuum forming processes. Students will see how product design plays an important role within the design and manufacturing industry. Students will learn a wide range of subject specific vocabulary. Students will be tested half way and at the end of the project to help retain and recall new information. Students will use maths skills in order to design and build their own nets to create packaging.	**Classwork and Homework** Summative and Formative Teacher assessments Close the Gap (CTG) Halfway and end of project Tests
UNIT 2	**Systems and control:** Students will have an understanding of: ● Levers ● Pulleys ● Electronics ● Input, Process output ● Cams ● gears	The project will introduce students to systems and control and give them an understanding of how this affects everyday lives and products. Students will have the chance to model various different systems using a mixture of physical models and CAD software. Students will be able to identify real life situations where these systems will be used and identify career pathways that could take them. Students will see how systems and control supports the design and manufacturing industry. Students will learn a wide range of subject specific vocabulary.	**Classwork and Homework** Summative and Formative Teacher assessments Close the Gap (CTG) Halfway and end of

		Students will be tested half way and at the end of the project to help retain and recall new information. Students will use maths equations to work out: resistance, voltage, gear rotations.	project Tests

YEAR 9			
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?**
UNIT 1	**Built environment -Design and Communication** ● This unit introduces students to research and investigate different artists, influences, users and craftsmen to use for their own styles and take further into their architectural projects ● They re-cap 3D drawing skills, both hand and Computer Aided Design, using 3d software to produce and refine their final design outcomes. ● Specifically one point and two point	Design and Communication is a key skill area within the art and Design & Technology curriculum. ● The course bridges skills and curriculum knowledge taught in Y7 and 8 with GCSE specification requirements. ● The course equips students with the skills and confidence to explore design and application in greater depth. ● The course has career and pathways guidance embedded into it to give learners an insight into careers associated with the design and built industry. ● It continues to inspire and develop creativity within the pupil's imaginations, solving problems and building solutions based	● Peer assessment ● Self assessment ● SPAG ● Marked against success criteria of the unit and skills undertaken ● CTG and

	perspective. Learners will also develop an understanding of isometric and orthographic drawing skills, which they will continue to build on during subsequent units of work. ● Work is produced and presented vis slides, for students to get a better understanding of GCSE presentation and annotation ● Students will research and explore media to best present their own work via use of: water colour, pastels, pencil crayons and sketchup.	on real life problems within a variety of contexts. ● Y9 builds on and provides practical application and context for mathematical, scientific, art and engineering principles, all of which are applied to the projects undertaken. ● The course is divided into 2 units of work, with each unit focussing on a different aspect of learning.	ways to move forward ● iterative design process ● annotation and evaluation of final design idea against final outcome and artista/ users needs. responses.
UNIT 2	● This unit introduces students to practical aspects and scaling by working with either 1:50 or 1:100 ● Students will build on previous learning to develop ideas and a better understanding of the assessment objectives, for refining their work through practical applications using: card, foam board. ● They are shown how to demonstrate iterative design process by evaluating and reflecting on their work ● Students are exposed to CAD and CAM software to create parts of their building to be lasered or 3D printed. ● Annotation and evaluation is an integral part of this unit in order for the learner to improve, review and work and reflect against the users' needs ● Risk assessment is carried out throughout the unit when working on their practical outcomes.		