

Subject Curriculum Overview for Academic Year 2022/2023

Subject: 3D Design (OCR GCSE)		Subject Leader: Mrs Fox	Year Group: 10	AUTUMN TERM
Topic	Key Learning Points		Key Vocabulary	Assessments
Year 10 GCSE 3D Design is split into two halves: The first half of the academic year provides students with the opportunity to produce a teacher lead project (stereo speaker), helping students to know and understand how to develop a personalised portfolio using the OCR exam board specifications. This is the last ‘practice opportunity’ students will have before independently demonstrating learnt theory and practical skills in an assessed piece of coursework. In the second half of Year 10, students will begin their first assessed piece of coursework, worth 60% of the overall GCSE grade. This portfolio continues into Year 11.				
Product Design and Electronics	<p>END POINT: Design and manufacture a working stereo speaker, including soldering all electronic components</p> <p><i>Stereo Speaker Project</i></p> <p>Students will:</p> <ul style="list-style-type: none">Analyse the given design brief demonstrating versatility in design thinking (who could the design be aimed at, what might this look like, what material could be used).Use structured approaches to design a speaker housing, taking into account manufacturing requirements such as appropriate jointing methods, fixings, sound quality and inside electronics structuring.Revisit how to accurately solder and know the functions of the stereo speaker components (resistor, capacitor, IC chip, electrolytic capacitor).Know what a dry joint is and be taught how to correct soldering mistakes.Understand the positive and negative terminals of applicable components.Know that solder is a fusible metal alloy made from tin and lead, and how the addition of flux cleans the solder from oxide films.Create a quality prototype of their final design using corrugated cardboard, masking tape and gum tape, ensuring all measurements are ‘to-scale.’Make final development decisions based on the prototype and justify the need for the improvements.Use a combination of CAD/CAM software (2D Design & the laser cutter) and traditional woodworking skills to create a final outcome using the planned materials, dimensions, production and manufacturing choices.		<p>Exploration, narration, sequencing, objectives, cutting list, prototyping, corrugation, scoring, manipulating, to-scale</p> <p>Alloy, flux, lead, tin, dry-joint, fusible, oxide film, resistor, capacitor, IC chip, integrated circuit chip, transistor, stereo speakers, twin cable, wire strippers, tinning, positive & negative terminals</p> <p>Counter-sink, chisel, abrasion, tension, belt sander, palm sander</p>	<p>Teacher-assessed folder work progression (the design process) using a combination of verbal and written feedback, with key areas to develop.</p> <p>Teacher assessed practical looking at practical manufacturing skills and quality of product outcome.</p> <p>‘Forms’ Summative assessment at end of half term to assess understanding of key learning points.</p>

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	<ul style="list-style-type: none"> Continue to make developmental decisions / adjustments where necessary, throughout the final manufacturing process and document as a photographic and narrated 'making diary'. Test the final system for functionality, usability and quality. Evaluate the product using appropriate criteria, detailing positive outcomes and pin-pointing areas for further development. 		
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Half term 1 Completion of the Stereo Speaker Project Half term 2 GCSE Coursework Portfolio	<p>Each student's portfolio consolidates knowledge, understanding and skills learned to this point. Students independently explore, research, design and manufacture a product of their choosing.</p> <p>A student's portfolio showcases both practical work and a personnel response to a set starting point / design context. The project continues into Year 11 and is worth 60% of their overall GCSE.</p> <p>A student's portfolio is broken down into four assessed key objectives:</p> <ul style="list-style-type: none"> <i>Through investigation, develop design ideas which demonstrate a critical understanding of sources.</i> <i>Refine work through exploring ideas, selecting and experimenting with appropriate media, materials, techniques and processes.</i> <i>Record design ideas, observations and insights which reflect aims and intentions as the design and manufacture work progresses.</i> <i>Presentation of a personal and meaningful response which reflects the design intentions and which also demonstrates an understanding of key design elements.</i> <p>By the end of Year 10, students will have completed most of the design process, including some prototyping of their final design. Students will not begin the full manufacturing process until Year 11.</p>	<p>Using vocabulary mastered from previous years, students embed subject specific terminology into their coursework portfolio, to demonstrate their knowledge and understanding of this subject specialism.</p>	<p>Teacher-assessed coursework portfolio progression using a combination of verbal and written feedback, with key areas to develop.</p> <p>This NEA portfolio is teacher marked by January of Year 11, and externally moderated towards the end of the Year 11 academic year.</p>

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How parents can support learning in the subject this academic year

Students will be expected to continue with folder work at home. Students should be encouraged to be working on their 3D Design work for approximately 1 hour per week. During the manufacturing stages, students will need to download photographs of their previous lesson, and add these to their work as part of their making diary. It always saves time in lessons (and possible internet issues) if these photographs were downloaded at home. Students should be encouraged to practise manufacturing skills around the home to help build confidence and accuracy using tools.

Recommended Reading

Websites:

<http://www.mr-dt.com/> <https://www.bbc.co.uk/bitesize> <https://technologystudent.com> <https://design-technology.org> <https://designmuseum.org>

Books:

- SketchUp for Dummies – Bill Fane
- IRONCAD Assembly Drawings – Sachidanand Jha
- Universal Principles of Design - William Lidwell, Kristina Holden, Jill Butler

Points to note

Whilst we do our utmost to stock materials for GCSE students to manufacture their bespoke products, any help in sourcing these for your child would be greatly appreciated.

All GCSE work remains on school site for the following academic year after manufacture. This may be collected once notifying and being agreed by Mrs Fox or Mr Haden.

We are, as a department, doing our utmost to source responsibly for our environment; Any parents/carers within the manufacturing or design industry who would like to donate off-cuts, or materials to re-use, please contact Mrs Fox, Head of Department (donna.fox@jmhs.hereford.sch.uk), with thanks.