

## Subject Curriculum Overview for Academic Year 2022/2023

Subject: 3D Design (OCR GCSE)		Subject Leader: Mrs Fox	Year Group: 9	AUTUMN TERM
Topic	Key Learning Points		Key Vocabulary	Assessments
<b>Term 1</b>  <b>Traditional wood work</b>	<p><b>END POINT: Manufacture a small storage box using two wood joints, demonstrating a variety of technical skills and through learning key technical knowledge</b></p> <p><i>Small storage box</i></p> <p>Students will:</p> <ul style="list-style-type: none"> <li>Analyse the design brief using specific taught skills (joinery, materials, aesthetics, storage, clients wants and needs) to design and manufacture a small storage box to this individual specification.</li> <li>Learn how to draw in an isometric perspective, understanding how this differs to a 3D oblique perspective.</li> <li>Revisit knowledge of materials and their properties and newly taught materials to demonstrate understanding of choice of materials for individual storage box designs.</li> <li>Learn seven types of wood joinery (dowel, rebate, finger, box, mortis &amp; tenon, butt, dovetail), and choose two joinery styles to create during manufacture, justifying choice of wood joint considering durability and aesthetics.</li> <li>Recall and demonstrate workshop health and safety rules during the manufacturing stages of the small storage box.</li> <li>Demonstrate precise mastery of taught skills in marking accurately in millimetres using a ruler and try square.</li> <li>Demonstrate the correct use of hand tools and machinery – cutting all component parts skilfully and accurately.</li> <li>Correctly use permanent and temporary fixings (screws, nails, panel-pins &amp; adhesives).</li> <li>Learn how to engrave a motif onto the small storage box using CAD/CAM, 2D Design and the laser cutter.</li> <li>Finish the product based on aesthetically informed decisions (vanish, wax, veneer, paint).</li> <li>Test and evaluate the product alongside personal design and manufacturing skills, using taught specification targets.</li> </ul>		Joinery; finger, dowel, rebate, butt, dovetail, box, mortis & tenon, biscuit, Tri-square, hard wood, soft wood, man-made board, grain, abrasive, counter-sink, chisel, aesthetic, abrasion, hinge, panel pin, pin hammer, tension, belt sander, palm sander, permanent fixing, non-permanent fixing, finishes, wax, vanish, veneer	Teacher assessed practical looking at practical manufacturing skills and quality of product outcome.  'Forms' Summative assessment at end of half term to assess understanding of key learning points.

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Topic	Key Learning Points		Key Vocabulary	Assessments
<b>Term 2</b>  <b>Product Design and Electronics</b>	<p><b>END POINT: Know the functions of electric components and to confidently solder a PCB (printed circuit board) within a manufactured mood lamp.</b></p> <p><i>Mood lamp</i></p> <p>Students will:</p> <ul style="list-style-type: none"> <li>• Use prior taught knowledge to analyse a design brief, independently identifying client requirements and annotating with design ideas.</li> <li>• Write a product specification using 'ACCESSFM' (aesthetics, cost, customer, environment, size, safety, function, materials/manufacture), detailing what the product will be and how this meets clients' wants and needs.</li> <li>• Use taught research skills to study existing solutions, identifying good design aesthetics, functionality, material properties, and areas for further development, whilst using higher level subject specific vocabulary to annotate.</li> <li>• Practise isometric and oblique hand- drawing techniques to create design ideas and CAD (computer aided design) visuals, to present work in a graphically accurate style.</li> <li>• Learn the functions of electronic components used in the mood lamp (resistor, LED, LDR).</li> <li>• Recall how to safely solder a PCB (printed circuit board).</li> <li>• Confidently use measuring tools within the 2D Design computer software programme.</li> <li>• Prepare a CAD visual of the final design and create all CAD mood lamp components accurately for laser cutter output; cut and engrave.</li> <li>• Manufacture the base of the mood lamp out of pine using a finger joint for durability and aesthetics.</li> <li>• Assemble CAM (computer aided manufacture / laser cutter) sections to the base, focussing on a quality finish and demonstrating an understanding of using either permanent or temporary fixings to assemble.</li> <li>• Test and evaluate the final mood lamp outcome using learned specification targets.</li> </ul>		<p>Electronics, solder, soldering iron, flux, circuit, dry joint, component, resistor, transistor, capacitor, jumper wire, input, output, side cutters, strippers, PCB, printed circuit board, finger joint, coping saw, tenon saw, scroll saw, strain relief, light emitting diode (LED), light dependant resistor (LDR), CAD, heat bender, acrylic, reflective, engrave, client, target market.</p>	<p>Formative assessment throughout the design and manufacture, feeding back on key learning points.</p> <p>'Forms' Summative assessment at end of half term to assess understanding of key learning points.</p>

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Subject: 3D Design (OCR GCSE)		Subject Leader: Mrs Fox	Year Group: 9	SUMMER TERM
Topic	Key Learning Points		Key Vocabulary	Assessments
<b>Graphics design and computer aided manufacture</b>	<p><b>END POINT: To confidently design &amp; manufacture a foamboard flat-pack point of sale unit.</b></p> <p><i>Point of Sale Unit</i></p> <p>Students will:</p> <ul style="list-style-type: none"> <li>Learn how corporate branding influences specific target markets.</li> <li>Analyse the design brief, decide on a chocolate bar to promote and demonstrate how to design for a client's needs and wider target market.</li> <li>Research existing chocolate promotional solutions (wrappers, packaging, limited edition features, logos, point of sale units) and annotate using key subject specific language to demonstrate design understanding.</li> <li>Use taught criteria (ACCESSFM) to write clear and justified specification targets more independently (less teacher lead) than previously this academic year.</li> <li>Be taught to analyse the material foamboard, understand its reinforced properties and structural integrity, and know how to prepare the material for laser cutting.</li> <li>Be taught how to draw accurate nets on 2D Design incorporating tabs, inserts and slots to create the flat-pack slot method of assembly.</li> <li>Demonstrate improvements in presenting work with visual creativity and accuracy, drawing in a 3D isometric perspective and adding gradient fill colour with pencils.</li> <li>Learn the importance of developing innovative design ideas to reach a better outcome.</li> <li>Use vector design software (Serif DrawPlus) to create chocolate bar promotional graphics that accurately fit the bespoke flat-pack design.</li> <li>Demonstrate knowledge of measuring and drawing accurately using CAD 2D Design.</li> <li>Learn how to safely use craft knives with cutting mats, metal rulers, hot glue and spray adhesive to accurately assemble flat-pack POS unit.</li> <li>Evaluate the final POS unit outcome and personal progress using learned specification criteria.</li> </ul>		<p>Graphics, vector, bitmap, client, functionality, stability, branding, slogan, point of sale, colour swatch, exploration, score, backing, durable, continuity, target market, promotion, flat pack, 3D forms, layers, innovative, bespoke, limited edition, palette, transparency, inspiration, theme, wrap, bleed, support, inserts, tabs, limited edition, isometric, oblique, perspective.</p>	<p>Formative starter tasks recalling CAD software knowledge and understanding.</p> <p>'Forms' Summative assessment at end of half term to assess understanding of key learning points.</p> <p>Peer visual assessment and target setting.</p> <p>Teacher formative assessment and feedback throughout the modifying process.</p>

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### How parents can support learning in the subject this academic year

- Encourage and help students with homework tasks, checking on the school homework system for tasks set and logging onto 'remote access' to go through class computer work.
- Encourage practical skill based activities at home including cooking and enabling students to use tools/power tools whilst supervised.
- Recommend watching documentaries together that follow the process of design and manufacture or cooking programmes to engage, motivate and excite within these specialisms.

### Recommended Reading

- <https://www.technologystudent.com/>
- <https://designmuseum.org/>
- SketchUp for Dummies – Bill Fane
- IRONCAD Assembly Drawings – Sachidanand Jha
- Universal Principles of Design - William Lidwell, Kristina Holden, Jill Butler

### Points to note

The Year 9, 3D Design GCSE transitional year, is focussed on embedding key practical skills in several design specialisms; graphics, traditional woodwork, product design, and electronics. As students move into their GCSE course (Year 10 and 11) their secure knowledge and understanding of these specialisms is recalled and focussed on at a higher level. Year 9 is therefore a key stage of learning for students to be prepared and fully able for the GCSE design and manufacturing journey.