

Year 10- Unit 3 - Design and Technology: Textiles

| Rationale and Context of Unit: | Core curriculum content: | Tier 2 & Tier 3 vocabulary explicitly taught: |
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| <p>Part of GCSE Design and technology, students must cover the core materials: Metal, Paper and board, Textiles, Polymers and Timbers. This SOL covers Polymers and Timbers in two separate small projects. The Timbers project works as a mini NEA (Non-Exam Assessment) to prepare students for their GCSE NEA.</p> <p>1.10 The categorisation of the types, properties and structure of thermoforming and thermosetting polymers.</p> <p>1.10.1 Thermoforming polymers, including:</p> <ul style="list-style-type: none"> a) Acrylic b) High impact polystyrene (HIPS) c) Biodegradable polymers – Biopol® <p>1.10.2 Thermosetting polymers, including:</p> <ul style="list-style-type: none"> a) Polyester resin b) Urea formaldehyde <p>1.10.3 Properties, including:</p> <ul style="list-style-type: none"> a) Insulator of heat b) Insulator of electricity c) Toughness <p>1.12 The categorisation of the types, properties and structure and natural and manufactured timbers.</p> <p>1.12.1 Natural timbers – hardwoods, including:</p> | <p>The main focus for this unit is to cover some of the core elements of the GCSE , in this case Polymers and Timbers. It will also prepare students for the NEA as students will be given a design context to work from. Students will also gain confidence using CAD/CAM. Both projects allow students to combine Textiles with the other core materials. These projects also allow students to take risk and be experimental.</p> <p>Polymers - focus tasks investigating with polymers. Depending on cohort, this could lead into a fully functionally product.</p> <ul style="list-style-type: none"> • Heat Press • Melting plastics – understand the difference between thermosetting and thermoforming • Stitching on plastics <p>Drawing strategies – focus tasks to cover the different design methods.</p> <ul style="list-style-type: none"> • Freehand sketches (2D and 3D) • Isometric and oblique projection • Perspective drawing • Orthographic and explored views | <ul style="list-style-type: none"> • CAM – Computer Aided Manufacture • CAD – Computer Aided Design • Insulator • Toughness • Biodegradable • Thermoforming • Thermosetting • Polymers • Polyester resin • Urea formaldehyde • Acrylic • HIPs • Hardwoods • Softwoods • Pine • Cedar • Oak • Mahogany • Beech • Balsa • Plywood • Medium density fibreboard (MDF) |

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| <p>a) Oak b) Mahogany c) Beech d) Balsa</p> <p>1.12.2 natural timbers – softwoods, including: a) Pine b) Cedar</p> <p>1.12.3 Manufactured timbers, including: a) Plywood b) Medium density fibreboard (MDF)</p> <p>1.12.4 Properties, including: a) Hardness b) Toughness c) Durability</p> <p>1.17 Develop, communicate, record and justify design ideas, applying suitable techniques.</p> <p>1.17.1 Develop and use a range of communication techniques and media to present the design ideas, including: a) Freehand sketches (2D and 3D) b) Isometric and oblique projection c) Perspective drawing d) Orthographic and explored views e) Assembly drawings f) System and schematic diagrams g) Computer-aided design (CAD) and other specialist computer drawing programs.</p> <p>1.17.2 Record and justify design ideas clearly and effectively using written techniques.</p> | <p>Design Brief “To design and make a product to me sold at a local attraction”</p> <p>Timbers – Students will create a product that is made from plywood. Using the laser cutter students will manufacture their product and use embroidery threads to create a unique design. Students will research their local attraction and create their own design suitable to be sold there.</p> <ul style="list-style-type: none"> • Working Drawing • Templates – modelling ideas • 2D design to create design which can be cut using the laser cutter. • Embroidery stitches. | <ul style="list-style-type: none"> • Hardness • Toughness • Durability • Isometric • Oblique • Perspective • Orthographic |
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| <p>6.6.1 Process that can be used to cut ad shape materials a) Laser cut</p> <p>6.7 Specialist techniques, tools, equipment and processes that can be used on natural, synthetic woven and non-woven, knitted, blended and mixed-fibre textiles to shape, fabricate, construct and assemble a high-quality prototype. 6.7.1 Tools and equipment 6.7.3 Fabricating/constructing/assembling</p> <p>6.8 Appropriate surface treatments and finishes that can be applied to natural, synthetic, woven and non-woven, knitted, blended and mixed fibre textiles for functional and aesthetic purposes. 6.8.1 Surface finishes and treatments</p> | | |
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| <p>Challenge and Support:</p> | <p>World wide learning/ links to 21st century:</p> | <p>Cultural capital/ Industry/ Enrichment:</p> |
| <p>Examples of projects are provided. Step by steps and writing frames can be provided for SEND/PP students. Keywords clearly visible in classroom.</p> <p>Fabric provided free to PP students. Students can either purchase their own fabric or off the school.</p> <p>Technician support available in some lessons to support students and the help with the equipment.</p> <p>Students are stretched and challenged with their design ideas and practical pieces. Students will be encouraged to</p> | <ul style="list-style-type: none"> ● Cognitive skills - problem solving, creativity ● Self-management and self-development ● Relationship-building skills – teamwork ● Systems thinking – decision making and reasoning. | <ul style="list-style-type: none"> ● East Norfolk College Trip – an opportunity for students to experience textiles at 6th Form. ● Students learn to be imaginative and creative, are able to problem solve, learn to take risks and becoming resourceful. ● Students learn about health and safety within industries and how |

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| <p>think and express for themselves in original ways, generate and develop ideas, define problems, push the boundaries for textiles techniques to exploit the potential of their individual hoodie. They can adapt pattern (e.g shape, style of hood, pocket, decoration, design)</p> <p>Extension tasks available during the lessons and for all homework tasks set. Exam questions.</p> <p>Scholarly directed reading – Research tasks allow students to be directed to websites and textbooks. Opportunities for students to read allow in class and provide oral feedback and contribute to class discussions.</p> | | <p>clothing are manufactured in industry.</p> |
| <p>Historical, Social, Moral, Spiritual, Cultural context:</p> | <p>Cross curricular links/ literacy/numeracy:</p> | <p>Common misconceptions:</p> |
| <ul style="list-style-type: none"> We look at the global and social impact with the production of natural and synthetic fibres. | <ul style="list-style-type: none"> Students will have opportunities to engage in speaking and listening activities through reading and writing. (e.g. class discussions, questioning, verbal feedback – self and peer, share research through presentations, annotate and comment upon the work of peers through reading, writing and listening, exercise books used for extended writing tasks) | <ul style="list-style-type: none"> Every material has the same properties. Students unaware they can combine materials together. Where fabric comes from? Unknown differences between natural and synthetic fibres. Different properties for each fabric. Products only take a lesson to make! Students unaware on how production works, the need for accuracy and time. |

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| | <ul style="list-style-type: none"> • Numeracy – measuring- producing working drawings, seam allowance.. Costings materials. • Homework – opportunities for students to produce extended writing pieces • Cross curricular – science, maths and geography. | |
| <p>Assessment timeline:</p> | | |
| <p>All groups of lessons will have a success criteria using EDSM and WAGOLL's. Feedback4 is used to assess current progress with students designs and practical skills. End of unit test (summative assessment) is performed using the google classroom platform. A01 –Investigate A02 – Design A03 – Manufacture A04 – Testing and Evaluate</p> | | |
| <p>Home learning</p> | | |
| <p>Senecra Assignments used for homework tasks and revision. GCSE Podcast Research Tasks</p> | | |
| <p>Feedback</p> | | |
| <p>Self and peer assessment used to mark the formative tests/exam questions. Self and peer assessment on design ideas and practical work using WWW/EBI. Homework marked using the star system. Feedback4 used to assess designs, practical pieces, and presentation of work. End of unit assessment</p> | | |

Length of unit (duration indicated in lessons)

| Unit 1 | Unit 2 | Unit 3 | Unit 4 | Unit 5 | Unit 6 |
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| <ul style="list-style-type: none"> • Intro project • Polymers • Thermoforming polymers • Thermosetting polymers • Heat Press | <ul style="list-style-type: none"> • Timbers • Softwoods • Hardwoods • Manufactured | <ul style="list-style-type: none"> • Communicating design ideas • Freehand sketches (2D and 3D) • Isometric and oblique projection • Perspective drawing • Orthographic and explored views • Assembly drawings • System and schematic diagrams | <ul style="list-style-type: none"> • Mini NEA • Research • Client • Product Specification | <ul style="list-style-type: none"> • Evaluation | <ul style="list-style-type: none"> • End of unit assessment |