KESTEVEN AND SLEAFORD HIGH SCHOOL

Design and Technology Scheme of Learning

Year 10 – Term 5-6/Section 1 - Core Technical Principles/Section 2 – Specialist Technical Principles/Section 3 – Designing and making Principles

Intent Rationale: Specification AQA Design and Technology 8552
Core Technical Principles (CTP): Taught through theory and practical application. Including: material categories; sources and origins of materials; properties of materials; modern and smart materials; new and emerging technologies; mechanical devices; electronic systems; energy storage and generation.
Specialist Technical Principles (STP): Taught through Textiles theory and practical lessons. Including: Users needs and contexts; past and present designers; environmental and social issues; design and communication; selection of materials; stock forms; surface treatments and finishes; prototypes; working with materials.
Designing and Making Principles (DMP): Taught through practical application and folder work. **1.Designing Principles: Investigation – primary and secondary data; The work of others; Design Strategies; Communication of design ideas and prototype development** **2. Making Principles: Selection of materials and components; Tolerances and Allowances; Material management and marking out; Specialist Tools, equipment, techniques and processes; Surface Treatments and Finishes**

Sequencing – what prior learning does this topic build upon?	Sequencing – what subsequent learning does this topic feed into?
• Y10 Terms 3-4 • Y10 Terms 1-2 • Y9 Skirt Project • Y8 Topic Textiles - Pyjama Project • Y8 Topic RM – Clocks – Design Movements • Y7 Wall organiser project	• Y11 – Design and Technology GCSE • A Level Design and Technology Fashion and Textiles
What are the links with other subjects in the curriculum?	**What are the links to SMSC, British Values and Careers?**
• History – study of different historical eras • Business Studies – manufacture marketing and pricing • Art – Presentation, illustration and design, design movements • Geography – Fair Trade; sustainability; environmental issues; sustainable energy production. • Physics – mechanical devices, energy generation and storage • Chemistry – polymers • Mathematics – GCSE maths skills – area; geometry; trigonometry; volume etc.	• Problem solving; independence; resilience; encouraging creativity; communication skills; confidence; organisation (GB4) • Links with social/cultural understanding –. (BV4) (BV5) (C1) (C2) (SP1) (SP2) (SP3) • Moral, social and Environmental topics covered on sustainability and cloth wastage. (C2) (M1) (SO1)
What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading?	**What are the opportunities for developing mathematical skills?**
• Independent research • Written instructions • Subject specific vocabulary	• Measuring skills using a ruler and tape measure • Seam allowance of 15mm in construction • Average measurements • Mathematical problem solving • Geometric understanding

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Intent – Concepts

What knowledge will students gain and what skills will they develop as a consequence of this topic?
Know • How to use research and exploration to identify and understand user needs • How to identify and solve their own design problems and understand how to reformulate problems given to them • How to develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations • Develop an understanding of developments in new materials, systems approach to designing and mechanical devices **Apply** • use a variety of approaches to generate creative ideas and avoid stereotypical responses • User needs and user centred design • select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture when appropriate • select from and use a wider, more complex range of materials and components, considering their properties • analyse the work of past and present professionals and others to develop and broaden their understanding • Make detailed plans in order to construct the desired product. **Extend** • test, evaluate and refine their ideas and products against a specification, considering the views of intended users and other interested groups • understand and use the properties of materials and the performance of structural elements to achieve functioning solutions

What subject specific language will be used and developed in this topic?	What opportunities are available for assessing the progress of students?
• Bulk buying – when materials are purchased in large quantities – this is cheaper because the set-up costs are the same no matter how many are made. • Tension – forces are pulling apart, such as a tug of war • Compression – forces are pushing together squeezing the object, such as squashing a drink can or sitting on a chair. • Shear – forces act across a material, such as scissors causing paper to be cut into two pieces • Bending – forces act at an angle to make it bend, such as too many books on a shelf (object is under tension and compression) • Torsion – Twisting forces – such as twisting a screw cap on a bottle. • Interfacing material – applied to fabrics to strengthen or stop stretching • Design Movement – A style of design particularly popular with a group of people or within a period of time (Arts and Crafts/ Art Nouveau/ Art Deco/ De Stijl/ Bauhaus/ Memphis • Negative feedback – used in a system to hold an output at a fixed level • Positive feedback – is used in a system to make sure something happens by magnifying a small change. • Hunting – is when a system is trying to achieve something but keeps overshooting the target, tries to correct but overshoots again • Flow charts – are used to plan sequences • Modelling – allows systems/ designs to be tested before committing to manufacture. • Biomimicry – design that strives to copy nature's patterns, structures and problem solutions. • Production aids - in this context templates and patterns • Basic blocks – these are standardised pattern templates that are produced in standardised sizes based on British Standards Institute (BSI) standard sizing, these are used to develop patterns for a wide range of garments by adding style details and decorative features to the design. • Tolerance – the acceptable range within which the size of the product can vary for example +/- 5mm • Quality Control – the systems put in place to ensure products are consistent in all respects and are produced to the acceptable standard – QC ensures that the product conforms to the manufacturing and product specifications.	**Outcomes & Key work for assessment:** **Practical Corset Project** design work; finished product; diary of make; evaluation. **Final Assessment of completed project.** **Year 10 Examinations** **Regular marking of class and homework.** **Tracking points.**

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Intent – Concepts

Lesson title	Learning challenge	Higher level challenge	Suggested activities and resources
Year 10 Examinations week 2			
Pattern cutting	Students understand how 2D patterns can be made into 3D products to fit the body using bust dart manipulation	Students develop and modify design ideas by practical application and modelling on the stand.	Students develop patterns for their design work, from basic blocks and modelling on the stand. **H/W independent tasks relating to Mock NEA**
Go over Year 10 Examination	Students are able to identify areas of learning to be developed and any misconceptions on topics covered so far in the course.		Students make notes of topics to be further revised.
Pattern cutting	Students understand how 2D patterns can be made into 3D products to fit the body using bust dart manipulation	Students develop and modify design ideas by practical application and modelling on the stand.	Students develop patterns for their design work, from basic blocks and modelling on the stand. Work is documented for Mock NEA submission. **H/W independent tasks relating to Mock NEA**
Selection of Materials and Components	Understanding of how to select appropriate materials and components considering functional need, cost and availability.	Students are able to relate learning to practical design and make project and use effectively to improve design concepts.	T:\Departments\Curriculum\Design and Technology\DT_Textiles\DT_GCSE\GCSE\3.DESIGNING AND MAKING PRINCIPLES\3.7 mats and comp
Manufacturing specification Tolerances and Allowances; Material management and marking out; Specialist Tools, equipment, techniques and processes; Surface Treatments and Finishes.	Creation of a manufacturing specification demonstrating an understanding of materials and components, costing, planning, working drawing, tolerances, construction methods and techniques.	A detailed manufacturing specification that is produced with comprehensive justification to inform manufacture.	Students work independently on construction and decorative tasks developing towards a final outcome. **H/W independent tasks relating to Mock NEA**
Specialist techniques and processes	Develop an understanding of how production aids, tools and equipment are used to manufacture products. How to cut and shape within tolerances. Are able to recognise a variety of commercial processes and how quality control is used in manufacture.	Be able to apply this knowledge to examination style questions in the text book.	T:\Departments\Curriculum\Design and Technology\DT_Textiles\DT_GCSE\GCSE\2.SPECIALIST TECHNICAL PRINCIPLES\2.8 specialist tech PP6 Builds on learning from Term 3-4 scales of manufacture Textbook p109-112
Making Health and Safety cutting out and when using sewing machines and irons. Risk Assessment, quality control, modifications, evaluation.	The correct tools, materials and equipment (including CAM where appropriate) have been used or operated safely with an adequate level of skill. Some quality control is evident through measurement and testing. Prototype shows an adequate level of making/finishing skills that are mostly appropriate to the desired outcome. A prototype of sufficient quality has been produced that may have potential to be commercially viable, although further developments would be required, and only partially meets the needs of the client/user.	The correct tools, materials and equipment (including CAM where appropriate) have been consistently used or operated safely with an exceptionally high level of skill. A high level of quality control is evident to ensure the prototype is accurate by consistently applying very close tolerances. Prototype shows an exceptionally high level of making/finishing skills that are fully consistent and appropriate to the desired outcome. An exceptionally high quality prototype that has the potential to be commercially viable has been produced and fully meets the needs of the client/user.	Students work independently on construction and decorative tasks developing towards a final outcome. Demonstrating accuracy, quality control and a high level of H&S **H/W independent tasks relating to Mock NEA**
Making			
Making			
Making			
Making			
Making			
Evaluating finished product – personal evaluation – TMG – specification.	Evidence that various iterations are as a result of considerations linked to testing, analysis and evaluation of the prototype, including basic consideration of feedback from third parties. Adequate testing of some aspects of the final prototype against the design brief and specification. Some reference is made to modifications either proposed or undertaken. Adequate analysis and evaluation is present at some stages of the project.	Extensive evidence that various iterations are as a direct result of considerations linked to testing, analysis and evaluation of the prototype, including well considered feedback from third parties. Comprehensive testing of all aspects of the final prototype against the design brief and specification. Fully detailed and justified reference is made to any modifications both proposed and undertaken. Excellent ongoing analysis and evaluation evident throughout the project.	Students work independently on final evaluation of completed prototype. Evaluating against the design and manufacturing specification and the the design brief. Feedback from TMG. **H/W independent tasks relating to Mock NEA**
Evaluating finished product – personal evaluation – TMG – specification.			
Forces and Stresses	Understanding of the impact of forces and stresses and how materials can be reinforced and stiffened so they can resist certain forces.	Be able to describe how forces can relate to textile products and how these can be reinforced, links to own work	T:\Departments\Curriculum\Design and Technology\DT_Textiles\DT_GCSE\GCSE\2.SPECIALIST TECHNICAL PRINCIPLES\2.2 Forces and Stresses PP2 Create a list of parts of a garment that might need interfacing
End of Term 5			
Selection of materials	Understanding of the influences that have an impact on design of products and the factors to consider when selecting materials and components.	Students should be able to make links to design work and contexts in previous design and making tasks and the NEA.	T:\Departments\Curriculum\Design and Technology\DT_Textiles\DT_GCSE\GCSE\2.SPECIALIST TECHNICAL PRINCIPLES\2.1selection of mats PP1

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Intro to NEA -context – planning time/ pages NEA research - context – computers Hour 1 NEA research - context – computers Hour 2	Using primary and secondary data to understand client or user wants and needs. How this can be linked to writing a design brief and design/ manufacturing specification. How to carry out research investigations into problems and needs.	Research is focused and specific to developing innovative and creative solutions to the contextual problems given by the exam board.	T:\Departments\Curriculum\Design and Technology\DT_Textiles\DT_GCSE\GCSE\NEA_practical\NEA\NEA_19-20 T:\Departments\Curriculum\Design and Technology\DT_Textiles\DT_GCSE\GCSE\3.DESIGNING AND MAKING PRINCIPLES\3.1 investigation data GCSE NEA PP Revision of Design and Making principles covered in mock NEA project. 3.1 Investigation, primary and secondary data – Text books p226-231 Independent research in response to contexts given. Planning 20 page layout (PP) on Technology Drive. (35 hours total – 15 of which are making product) **H/W independent research and planning relating to NEA**
Work of Others – D&MP Theory linked to NEA	Understand and recognise the work of well-known designers and companies and how their work can help us develop our own designs – link to NEA research	Be able to developing innovative and creative solutions to the contextual problems given by the exam board using relevant designers and design movements.	Students have already studied Alexander McQueen and Vivienne Westwood. Also a number will have encountered Mary Quant, Dior and Chanel in Year 9 skirt project. T:\Departments\Curriculum\Design and Technology\DT_Textiles\DT_GCSE\GCSE\3.DESIGNING AND MAKING PRINCIPLES\3.3 work of others Textbook 3.3 p238-249
NEA research – primary & secondary research – planning to include relevant Designers and Art movements. NEA research secondary – computers Hour 3 NEA research secondary – computers Hour 4	Using primary and secondary data to understand client or user wants and needs. How this can be linked to writing a design brief and design/ manufacturing specification. How to carry out research investigations into problems and needs.	Research is detailed, focused and specific to developing innovative and creative solutions to the contextual problems given by the exam board.	Independent research in response to contexts given. Planning 20 page layout (PP) on Technology Drive. (35 hours total – 15 of which are making product) **H/W independent research and planning relating to NEA**
Design Strategies – D&MP Theory linked to NEA	Understand how to develop innovative and creative ideas, use collaboration to broaden and develop ideas, understand the needs and wants of others, use a systems approach. Understand the use of the iterative approach to design and prevent design fixation.	Develop an understanding of how these design strategies have been used by designers to create innovative products. Recognise the need for analysis and evaluation at every stage of the NEA project with both positive and negative feedback	T:\Departments\Curriculum\Design and Technology\DT_Textiles\DT_GCSE\GCSE\3.DESIGNING AND MAKING PRINCIPLES\3.4 design strategies Using strategies such as ACCESSFM product analysis Geometry, Nature - Golden Ratio/ Biomimicry, cultural influences to develop design ideas.
NEA research planning primary research – interview, Target Market Group, Client profile – identifying specific wants and needs – Data presentation NEA research primary – computers Hour 5 NEA analysis of research, design brief and specification - planning NEA computers – Hour 6 NEA catch up NEA catch up	Design possibilities identified and explored, linked to a contextual challenge demonstrating a good understanding of the problems. A user has been identified that is mostly relevant to the contextual challenge and student has undertaken an investigation of their needs and wants, with a good explanation and justification of most aspects of these. Detailed investigation into the work of others that has influenced ideas. Evidence of investigation of design possibilities at various stages in the project with good justification and understanding of possibilities identified. Good design brief with an attempt to justify how they have considered most of their client's needs and wants and has clear links to the context selected. Detailed design specification with good justification linking to the needs and wants of the client/user. Largely informs subsequent design stages.	Design possibilities identified and thoroughly explored directly linked to a contextual challenge demonstrating excellent understanding of the problems. A user has been clearly identified and is entirely relevant in all aspects to the contextual challenge and has undertaken a comprehensive investigation of their needs and wants, with a clear explanation and justification of all aspects of these. Comprehensive investigation into the work of others that clearly informs ideas. Excellent design focus and full understanding of the impact on society including; economic and social effects. Extensive evidence that investigation of design possibilities has taken place throughout the project. Comprehensive design brief which clearly justifies how they have considered their user/client's needs and wants and links directly to the context selected. Comprehensive design specification with very high level of justification linking to the needs and wants of the client/user. Fully informs subsequent design stages.	T:\Departments\Curriculum\Design and Technology\DT_Textiles\DT_GCSE\GCSE\NEA_practical\NEA\NEA_19-20 GCSE NEA PP **H/W independent research and planning relating to NEA** T:\Departments\Curriculum\Design and Technology\DT_Textiles\DT_GCSE\GCSE\NEA_practical\NEA\NEA_19-20 GCSE NEA PP Textbook p231-233 **H/W independent research and planning relating to NEA** **Planning for Social, Moral and Environmental aspect of NEA project** **Read PDF doc – The True Cost of Fashion** P:\DEPARTMENTS\Technology\Y10_11_DT GCSE\Specialist Technical Principles
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