

Year 7 Design & Technology Curriculum

Topic / Project Context	Key knowledge and skills	Rationale
Introduction to Food	<ul style="list-style-type: none"> ● Working to a brief ● Research sports ● Sketching ideas ● Annotation - using sensory words, function ingredients and nutrition. ● Planning the making of products ● Weighing, measuring ● Identifying key parts of the cooker ● Identifying and naming key equipment ● Shaping, forming ● Assembling ● Slicing, dicing using the bridge and claw technique ● Understanding of boiling, simmering & reduction ● Physical and chemical properties of ingredients. ● Star profile ● Sensory analysis ● Introduction to nutrients and their function. ● Knowledge and understanding of ingredients in a recipe and their sensory qualities ● Introduction to sensory analysis ● Using key equipment correctly ● How to use the various parts of the cooker safely and correctly. ● Weighing ● Measuring ● Ratio of ingredients ● Literacy - key words & terms, ● Reading recipes ● Following instructions ● Understanding abbreviations eg tsp, tbsp ● Creating and documenting recipes ● Using descriptive words to express the colour, flavour and texture of foods (sensory descriptors) 	<p>Pupils study Food through a design and make process as part of the Design and Technology National Curriculum. During Key stage 3 students learn to make a variety of predominantly savoury dishes so they are able to feed themselves and others a healthy varied diet. They become competent in a range of cooking techniques for example selecting and preparing ingredients; using utensils and electrical equipment: applying heat in different ways: using awareness of taste, texture and smell to decide how to season dishes and combine ingredients; adapting and using recipes.</p> <p>They develop essential knife skills which enable them to prepare fruit, vegetables and meat safely and hygienically. Students also learn how to operate the hob, grill and oven safely and effectively to produce good quality dishes. Students are encouraged to adapt existing recipes which enable them to create new and more skilful products while considering nutrition, sustainability, cost and dietary needs.</p> <p>To be successful pupils are expected to apply hygiene and safety rules when working with food. Pupils will know how to weigh and measure ingredients, and how to use the cooker and other equipment and materials to the best of their advantage. Pupils will enjoy the creative and practical process of designing, planning and cooking a range of food that shows an awareness of diet and nutrition.</p>

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Fidget Widget	<ul style="list-style-type: none"> ● Writing Design Brief. ● Research design stimulus ● Product Analysis into blister packaging ● Brainstorming ● Sketching Ideas ● Developing Ideas via sketching ● Annotation ● Drawing Development ● CAD – 2D design – Drawing to a set size, contouring, Developing skills to produce own design. ● Package Design in CAD – Fill & Text work ● Verbal planning of fidget widget ● Using machine screws and lock nuts to assemble ● Adding Colour to engraving with pastels. ● Laminating & finishing blister package ● Product Analysis of Packaging ● Understanding of the comparative advantages and disadvantages of designing and sketching by hand versus use of CAD. ● Knowledge and understanding of Standard Components such as machine screws and lock nuts. ● Links with other material areas that use standard components such as clasps and hook and eyes for textile based projects and ingredients in food. ● Introduction to polymers; specifically acrylic and links to textile projects that acrylic can be a fabric too. ● Knowledge of laser cutters, how they work and can be used in school and project work. ● CAD: Intro to coordinate systems. ● Drawing and dimensioning to a set size ● Literacy – keywords & terms as stated in the project booklet. ● Reading booklet to gain understanding of design context and task. ● Reading key commands in CAD 	<p>This PoS aims to engage pupils in designing products that are ultimately designed using CAD and manufactured using CAM. We want pupils to learn how CAD and CAM plays an important part in the design and manufacture of commercially viable products. The CAD software pupils learn is Design Tools 2D Design and they learn the key functions outlined above in order to design and develop their product. They learn about CAM and specifically the basic operation of laser cutters and their use in schools and they can relate this to the wider world of commercial manufacture. Pupils are also challenged to design for an identified client, which maybe themselves and write a simple design brief from which they sketch, model and CAD their ideas Pupils are challenged to learn where the materials and practices learned in this project are also relevant in their other projects so pupils begin to see the subject holistically as D&T rather than separate materials For example, They learn specifically about acrylic as a polymer sheet and the different forms acrylic can be supplied, eg a thread for making fabric. Assembly of the item teaches pupils the use of machine screws and lock nuts as both mechanical fasteners and standard components. They also learn about the use of standard components in other projects such as the Hobby Apron.</p>

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Roll Round Toy	<ul style="list-style-type: none"> ● Writing Design Brief from context ● Writing Specification ● Research design stimulus ● Brainstorming ● Sketching Ideas ● Developing Ideas via sketching. ● progression into 3D sketching of designs ● Annotation ● None ● Technical drawing ● Marking Out ● Wasting processes using coping saw, drills, files, rasps. ● Use of hand drill and pillar drill. ● Assembly – hammer / pins / PVA glue ● Use of Vertical Belt Sander ● Use of Vacuum Forming & trimming. ● Making of promotional label ● Assembly of Packaging ● Evaluation of design work as it progresses. ● Evaluation of final product using 3rd party feedback to inspire improvements ● Research into Polymers-classification & uses. ● Impact on the environment of polymers. ● Vacuum Forming ● Vacuum Forming Mould Design ● Tools & Equipment Identification ● Health & Safety ● Measuring in mm. ● Literacy keywords & terms as stated in project booklet. 	<p>This PoS aims to engage pupils in the designing and making products that are made by the use of conventional manufacturing processes and hand skills. We believe the fine motor skills developed through using hand tools is an important skill to develop. As is the awareness of how different materials can be shaped and formed through a range of processes. Pupils learn how to write a simple design brief focussing on who, why and what that gives a focus for their designing. They also develop a basic specification that gives a focus for evaluation. Pupils learn (develop) the skill of brainstorming to generate initial ideas in addition to peer discussion and simple contextual research to focus their thinking. We believe that pupils need to learn and develop communication skills initially through two and three dimensional sketches that are annotated. Pupils are challenged to review designs and develop them until a functional and appealing product is proposed. We want pupils to develop their knowledge, understanding and application of the safe working use of a range of hand tools and processes in the workshop and back up their knowledge with booklet retention exercises. It is important for pupils to learn about a range of polymers, their source and origin, their classification and use. Emphasis is placed on the impact on the environment use of polymers has and how this can be controlled. Pupils learn to evaluate, not only as their ideas progress but at the end of the project when third party input is expected and pupils are required to review their designs and suggest improvements. Pupils are challenged to learn where the materials and practices learned in this project are also relevant in their other projects so pupils begin to see the subject holistically as D&T rather than separate materials.</p>

Year 7 Design & Technology Curriculum

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Hoppy Apron	<ul style="list-style-type: none"> ● Writing design brief ● Writing Specification ● Research design stimulus ● Product Analysis utility apron ● Brainstorming ● Sketching Ideas ● Developing Ideas via sketching ● Annotation ● Technical drawing ● Modelling making paper template/ pattern ● Layplan marking out and cutting ● Learning how to hem ● Hand sewing ● Set up and use of the sewing machine for machine skills ● Learning how to make a seam ● Embroidery and Applique ● Self evaluation ● Specification comparison ● Fibre classification ● Fabric construction ● Anthropometrics ● Machinery and equipment identification ● Health & Safety ● Measuring in inches ● Tolerances ● Anthropometric importance ● Dimensioning template to scale 1:1 ● Literacy – keywords & terms ● Reading booklet to understand design context and task. ● Annotation/ Specification/ Evaluation. 	<p>This PoS aims to introduce pupils to designing and making using textile based materials specifically for a real client. Students begin to design initial ideas developing their understanding of materials to learn about anthropometrics and take sizes from a real person and products which progresses to paper templates which are used to mark out on cloth. Students learn how to safely make a hem and seam using the sewing machine and continue to reflect throughout the making process to refine their intentions as their experience develops and their skills improve. Students learn about decorative techniques such as embroidery and applique to develop their hand skills when learning to sew using running stitch. Students adapt their straps to suit their client. Students review their initial specification with an evaluation. Theory tasks encourage students to think about where materials come from- nature or synthetic and make the connection between materials they are using across the subject such as acrylic for their fidget spinner.</p> <p>Pupils also learn about the environmental impact of materials looking at cotton. Pupils are encouraged to problem solve as the project runs as they have to make ongoing choices to refine/ simplify ideas to produce a product which is fit for purpose. This can be reflected upon in the evaluation.</p>

Year 8 Design & Technology Curriculum

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Meal Deal	<ul style="list-style-type: none"> ● Interpreting a design brief ● Investigating meal deal products and recipe ideas that are appropriate. ● Generating meal deal ideas ● Planning practical activities effectively ● Practicals linked to key terminology and food science: ● Coagulation ● Denaturation ● Fermentation ● Gelatinisation ● Binding, coating, shaping, forming ● Practicals linked to the different sections of the Eat well guide ● Meal deal range ● final evaluation ● verbal evaluation of products ● Food miles, carbon footprint, seasonality of fruit and veg. Impact on the environment ● Basic introduction to Food science with an understanding of the chemical and physical properties of the ingredients: - bread making - kneading proving, function of ingredients - fermentation. ● Sauce making - gelatinisation, key temperatures and the role of starch ● Lemon meringue pie - whisking, the role of protein in the filling and meringue key terms - coagulation, denaturation - chemical and physical properties. ● High risk foods - such as chicken and eggs. How to avoid cross-contamination. ● Exam questions in the booklet ● Starter test ● Ratio, weighing, measuring, scaling up/down ● Portion sizing ● Identifying key terms and definitions throughout the course; demonstrations, written tasks and homework. ● Reading recipes ● Following instructions ● Creating and documenting recipes 	<p>In Year 8 pupils continue to build on skills covered in Year 7 with a stronger emphasis on the function of ingredients in food, a deeper awareness of a balanced diet producing a range of predominantly savoury dishes to a good standard. Pupils also start to have a greater awareness of the science behind the role of ingredients in a recipe (physical and chemical properties of ingredients).</p> <p>The key concepts covered in Year 8 are:</p> <ul style="list-style-type: none"> • Pupils are taught Diet and nutrition • The Eatwell Guide - pupils are taught about each section and the basic nutritional value <p>Understand the source, seasonality and characteristics of a broad range of ingredients</p> <ul style="list-style-type: none"> • Adapting an existing recipe • Practical cooking skills • Functions of ingredients -physical and chemical properties of key ingredients <p>An understanding of the following terms - gelatinisation, dextrinisation, denature, coagulate.</p> <p>Year 8 practical lessons include making soup, bread, rice dish such as paella, bread, roux sauce, lemon meringue pie, goujons and dip, carrot muffins, meal deal.</p>

Year 8 Design & Technology Curriculum

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Animator	<ul style="list-style-type: none"> ● Write a design brief from a given context ● Write a design specification ● Relevant research that leads to designing and the design specification - task analysis, client discussion, collecting images ● Designing characters for their animator ● Modelling and refining their animator through card models ● Producing a cutting plan for the plywood ● Develop skills using the following: <ul style="list-style-type: none"> ● coping saw, ● scroll saw, ● belt sanding, ● hand sanding, ● cordless drills, ● machine screws and nuts. ● Final decoration with either pencils or pens ● Links to the modelling of their animator and improvements needed to function efficiently ● Links to quality of practical work produced ● Motion ● Levers ● Mechanical advantage ● Wood and the environment ● Door frame challenge ● Levers ● Mechanical advantage ● Key terms in motion: Linear, Reciprocating, Oscillating and Rotary ● Key terms in levers: fulcrum, effort and load ● Key terms in woods: hardwood, softwood, manufactured boards and respective exemplar names of materials 	<p>This PoS aims to engage pupils in the designing and making products that develops their hand skills and use of workshop tools and processes introduced in Year 7.</p> <p>Designing focuses on the creation and development of a cartoon character that could appear in an animation movie. Originality and creativity is the focus and pupils can not copy an existing easily recognisable character. Development of the character is facilitated through modelling in card rather than sketching. Within their designing pupils produce a design brief and specification which builds on the similar skills taught in Year 7. From the model pupils develop a toy that could be sold as part of the promotion of the film. The toy has to have moveable joints and must climb up strings.</p> <p>Pupils develop their use of using rechargeable and bench / pillar drills plus the use of coping and scroll saws to produce the toy. Emphasis is placed on quality of outcome from both a functional and aesthetic perspective.</p> <p>Pupils are taught about classification of wood based materials and their impact on the environment. They are also taught about standard components used in the construction of their toy and links are made as appropriate to other projects.</p> <p>Identification and classification of levers within common products found around the home is also taught along with the mechanical advantage levers give.</p>

Year 8 Design & Technology Curriculum

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Electronic Dice & Game	<ul style="list-style-type: none"> ● Simple brief and intent of game ● Basic discussion & research into what makes a game educational and fun. ● Independent and informal research with prospective clients (family) as to the theme of a family game and how it can improve during development. ● Brainstorming, sketching, modelling of game. ● Modelling circuits in Crocodile Clips ● Verbal planning on how best to assemble PCB and PCB to circuit holder. ● Develop skills using the following: soldering, line bending, modelling and construction in paper and card. ● Developing CAD skills in 2D to complete a range of mini tasks that skill pupils to be able to produce a net of electronic dice holder independently. ● Design evaluation with peers and family as the game develops. ● Testing game by playing game with target market and using feedback to improve the design of game. ● Electronic component recognition including drawing of circuit symbols for Resistor, LED, Push to make switch, PIC chip. ● Evaluation of light sources and their impact on the environment: comparing LEDs to halogens and incandescents ● Understanding of a basic led/resistor network and the use of the resistor in the circuit. ● Basic current flow theory and making and breaking circuits. ● Units of measurement for voltage, current and resistance. ● Calculation / sizing of resistor to protect LED through modelling in crocodile clips. ● Basic introduction to PICs and their use in products ● Basic introduction to systems; input, process and output. ● Electronic component units and values, Ohms for resistance and selection of a suitable size resistor completed by trial and improvement on Crocodile Clips ● High level pupils may calculate size of resistor required using ohm's law. ● Key words; Current, Voltage, resistance, Amps, Volts, Ohms. 	<p>This PoS aims to develop their CAD skills in using 2D Design and builds on the skills learned in the Fidget Widget Project. Pupils develop the skills of using coordinate systems to draw shapes accurately and to a specific size. They develop a range of CAD skills to produce the net shape of a line bent PCB holder that has to be drawn with precision in order for the PCB to fit. This is a rigorous task for Year 8 and the produced net is used as a main focus for assessment.</p> <p>Pupils also develop the skill of soldering components to a PCB. They are taught component recognition and how to identify where a component is to be placed in the PCB. Pupils are taught how to identify simple faults in the soldering such as “birds eyes” and dry joints if appropriate. Completion of the circuit is another main focus of assessment. Pupils’ recognition, knowledge and understanding of the electrical and electronic components that make up the circuit is important and this is supported by booklet retention tasks. Basic circuit theory is also taught such as current flow, resistance and voltage found in led / resistor networks plus calculation of protective resistors. In addition pupils are introduced to the use of PICs as a control of basic circuits as the dice circuit makes use of a preprogrammed PIC. The third focus for assessment is to develop pupils designing skills primarily through iterative modelling rather than sketching. This is done through the design and prototyping of a game. Pupils are challenged to develop a game that is in some way educational and fun to play. They trial their games with prospective clients from their chosen market sector, family for example and develop a playable prototype for their findings. This aspect of the project is focused on independent learning in the development of the prototype game. Pupils are free to choose the context for their game and how to make the prototype using hand skills or CAD skills or a mixture of the two. Emphasis is placed on originality and creativity of the game rather than quality of outcome and pupils are actively warned about copying exciting games available but may develop such games as a result of critical evaluation.</p>

Year 8 Design & Technology Curriculum

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Small Storage	<ul style="list-style-type: none"> ● Interpretation of a design brief ● Constructing a bespoke specification ● Client interview ● Product analysis ● Activity investigation to identify aspects that need to be addressed ● Annotation ● Initial brainstorm ● Development and final ● Modelling ● Pattern drafting ● Lay planning ● Hand sewing ● Use of the sewing machine ● Embroidery & embellishment ● Modification of pattern pre modelling. ● Client review. Product comparison ● Final evaluation - only for HL ● Material construction. ● Material classification. Smart and Modern materials. ● Sustainability ● Pattern drafting, ● Lay planning, ● Anthropometrics 	<p>This Pos aims to develop skills learnt from previous experience with the focus on making students more independent when setting up the sewing machine.</p> <p>Students then make a portable storage product using a template learning how to draft onto cloth then sew a hem and seam with pocket quantity and sizes specified by the client.</p> <p>Students continue to develop their use of decorative techniques like embroidery using a wider range of hand stitching such as whipped running stitch and chain stitch for the more able.</p> <p>Students continue to develop their decorative techniques with an applique and some embellishments.</p> <p>Students are introduced to some fastenings and will use ties to secure the portable storage product.</p> <p>Students develop their design skills using the technical knowledge they have learnt to produce ideas and paper models.</p> <p>Some pupils will complete a final evaluation to reflect WWW & EBI.</p> <p>Theory tasks aim to develop understanding of materials with greater depth.</p>

Year 9 Design & Technology Curriculum

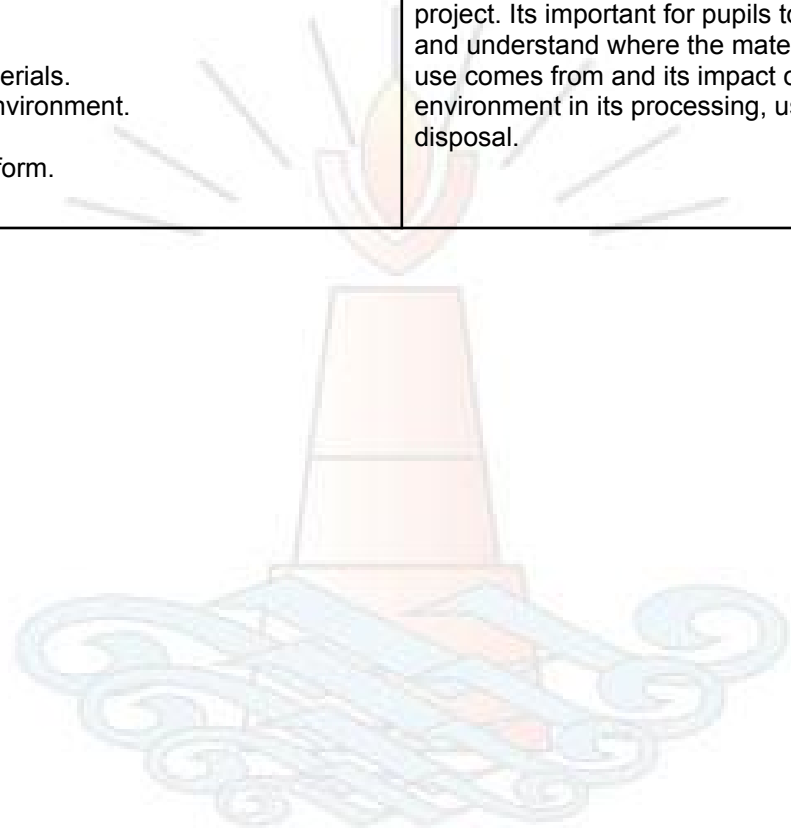
Topic / Project Context	Key knowledge and skills	Rationale
Street Food	<ul style="list-style-type: none"> ● Designing for others ● International cuisine ● Specific dietary need - e.g. lactose intolerant, diabetes ● Logo design ● Packaging materials ● Explore Food - to produce a food label ● Research a country of their choosing and investigating - cooking techniques, nutritional aspect, history, climate and the influence this has on the foods grown/reared, staple food, habits observed when eating food, serving techniques, traditional food/ingredients/recipes. ● Corporate image - logo, packaging, stall ● Modifying recipes to meet a specific nutritional need ● Planning for street food ● A range of sweet and savoury products from various countries - Mexico - fajitas, guacamole, salsa and wraps, Italy - Pasta making - ravioli, tortellini, spaghetti or tagliatelle - fillings, sauces such as tomato, roux sauce. Pizza making - modifying the recipe for a specific need such as lactose intolerance, diabetic, coeliac. India - curry making, samosa - filo pastry with a vegetable filling ● Modifying recipes where appropriate. ● Choosing skill level to stretch and challenge. ● Making a variety of street food based on the pupils choice of country. ● Evaluation of recipe to identify if it meets the need using Explore Food ● International cuisine ● Dietary needs of a specific group ● Logo design ● GCSE exam questions, multiple choice tests. ● Cross- contamination, food safety, key temperatures, food probe, ● Pricing of ingredients/ products ● Temperature and weight conversion ● Scaling up/down ● Key terms throughout ● Reading recipes ● Follow instructions ● Creating and documenting recipes ● Reading labels 	<p>In year 9 pupils bring together skills taught in year 7 & 8, developing them further to have more autonomy over adaptation and choice of dishes. Pupils start to look at Multi Cultural food, origins, typical dishes related to various countries. Students complete an independent research task about their chosen country. This enables pupils to have an in depth knowledge about cuisine, history, geography and cooking methods. Pupils become more confident and competent in a wide range of equipment from hand blender, food processor to pasta machine. Pupils develop a range of street food products based on their chosen country, design packaging, logo and present the dishes. Pupils gain an understanding of some specific dietary needs and modify a pizza to meet the chosen need. They learn how to use Explore Food to undertake a nutritional analysis on their dish and produce a traffic light label,</p>

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Illumination	<ul style="list-style-type: none"> ● Inspiration board produced to show work of: ● George Carwardine and the Anglepoise Lamp. ● Ettore Sottsass and Memphis Milan ● Biomimicry and examples of products and buildings inspired by nature. ● Inspirational Images of nature. ● Development of net shapes from templates ● Iteration through; ● Sketching ● Modelling ● CAD ● Verbal planning and sequencing as to what the best sequence of events to make is. ● FPT for base; ● Safe working practices using ● Tenon Saw ● Pillar Drill ● Rechargeable Drill ● Vertical Belt Sander ● Mini Band Saw with cutting jig for base ● FPT for LED array with safe use of ● Soldering ● Assembly of lamp using; ● Countersink screws ● Screw Dowels / Furniture Screws, washers and Lock Nuts ● Iterative evaluation through designing and refining shade as it progresses through sketches and CAD. ● Electronic component recognition ● Basic systems design ● Using systems design to propose basic systems to real life situations ● Measuring ● use of CAD and coordinates ● basic geometry / geometric shapes identification. ● Keywords associated with electronics 	<p>This PoS aims to bring skills together from Year 7 and 8 projects. They develop independent research skills in researching the work of George Carwardine as a British engineer who developed the Anglepoise Lamp. They look at the work of Memphis Design and learn about the typical; products they produced. They are also introduced to biomimicry and use this research in the independent and individual design of their shades. They build their independent CAD skills in producing the design on their choice of net. They learn about nets and how they fold to make 3D objects. They build on their independent soldering skills in the assembly of a PCB, furthering their knowledge of electronic components, PCBs and basic circuit theory. Pupils develop their practical skills in cutting material to a set size in the construction of the body of the lamp. They develop their safe working practices in using the tenon saw, mini band saw, pillar drill, bench drill, rechargeable drills and vertical belt sander. They learn basic principles of batch production and use templates and jigs in the production of the individual pieces of the lamp. They learn about a range of standard components in the assembly of the lamp and identify other standard components used in other projects across the department.</p>

Year 9 Design & Technology Curriculum

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Manufacturing- Containers Picture Frame	<ul style="list-style-type: none"> ● Making out to set sizes by hand using traditional tools such as Try Square, Rule. ● Marking out using templates to ensure accuracy and repetition of form. ● Cutting materials to size using traditional hand tools such as Tenon Saw. ● Use of Pillar Drill as appropriate ● Use of files and rasps as appropriate ● Use of hammer and pins for construction ● Assembly using PVA glue ● Application of a suitable finish, wax,oil,paint etc. ● Knowledge and understanding of sources and origins of materials. ● Impact of processing, using and disposal materials on the environment. ● Classification of materials. ● Use of production aids to ensure accuracy and repetition of form. ● H&S in the workshop 	<p>This PoS aims to consolidate practical skills taught in years 7 and 8 and introduce new ones as appropriate. Knowledge of manufacturing methods such a batch production is exemplified through the use of templates that is introduced in the skirt project. Its important for pupils to know and understand where the materials they use comes from and its impact on the environment in its processing, use and disposal.</p>



Year 9 Design & Technology Curriculum

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Skirt	<ul style="list-style-type: none"> ● Draft a specification from a brief ● Fabric suitability ● Annotations ● Client profile ● Initial design concepts with annotation ● Final design with annotation. ● Pattern drafting - modification of stock blocks ● Set up and use of the sewing machine to aim to complete machine processes with little assistance ● Making seams ● Making darts ● Making a hem ● Making a waistband ● Attachment of a zip ● Additional feature like a frill/ decorative feature/ embroidery/ embellishment ● Self evaluation ● Client evaluation ● Specification and product comparison ● Anthropometrics and Ergonomics ● Stock forms ● Scale of production ● Quality control and assurance ● Anthropometrics ● Pattern modification ● Key skills and terminology throughout 	<p>This Pos aims to build on previous learning in Years 7 & 8 from hems and seams progressing to pattern drafting, adding darts/ waistband and adding additional challenge of a zip. The students are encouraged to become increasingly independent when setting up and using machines which they should be able to do with significantly less help than in Years 7-8. Students face the additional challenge of making a product which has to fit a client therefore requiring more precision and accuracy when measuring out and making a pattern. Students also learn how to fit a zip using a zipper foot on the sewing machine.</p>