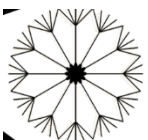


Year 10 Curriculum Content Overview 2018-19

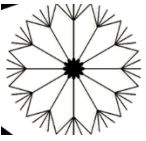
Design & Technology (AQA)				
Knowledge and Skills Students will be taught to....	Reading, Oracy, Literacy and Numeracy	Formative Assessment	Summative Assessment	Link to reformed GCSE Content
<ul style="list-style-type: none"> ● Apply and develop further learned skills (including those from the development stage) to work safely within the workshop and textiles room. ● Apply and develop further learned skills (including those from the development stage) to work safely when using equipment and machinery in the workshop and textiles room. ● Select the appropriate tools/equipment that is needed to manufacture a product. ● Apply learned skills to accurately and safely manufacture a range of products in a number of different material areas. ● Apply and develop further learned skills to be able to interpret their designs or designs of others to manufacture a product. ● Identify/describe/explain sources, origins and properties of materials. ● Identify/describe/explain how to work with materials. ● Identify/describe/explain commercial manufacturing, surface treatments and finishes of materials. ● Identify/describe/explain energy generation and energy storage. ● Identify/describe/explain what modern, smart, composite materials and technical textiles are. ● Identify/describe/explain/apply principles for designing and making. 	<p>Reading</p> <ul style="list-style-type: none"> ● Interpreting instructions for manufacturing products. ● Reading and understanding recipes to produce a food product. ● Scanning articles to provide information as part of research. 	<p>Questioning in lessons.</p> <p>Verbal feedback during lessons on practical work.</p> <p>Low stakes quizzing.</p> <p>Exit strategies.</p>	<p>3 assessments throughout the academic year.</p> <p>Each practical project will be assessed, where students will receive teacher feedback.</p>	<p>Designing for a client.</p> <p>Unit 5 - Materials.</p> <p>Unit 2 - energy, materials, systems and devices.</p> <p>Unit 6 - Designing principles.</p> <p>Unit 7 - Making principles.</p> <p>NEA - contextual challenge.</p>
	<p>Numeracy</p> <ul style="list-style-type: none"> ● Calculating surface areas ● Calculating wastage ● Graphical presentation of design ideas ● Measuring in mm ● Use of ratios 	<p>Generic whole class feedback on NEA portfolio.</p>		
	<p>Oracy and Literacy (including keywords for practical subjects)</p> <ul style="list-style-type: none"> ● Key words ● Student discussion ● Student demonstrations 	<p>RAG rating of work to advise students of where there are gaps in their NEA portfolio.</p>		



Assessment Skills, Knowledge and Concepts Map

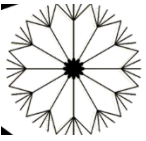
(These need to be mapped backwards from GCSE and ensure that all students can access their target percentage) – what do all students need to achieve in year 7 to be able access their target grade and be on track for their year 11 target grade?

	Design & Technology (AQA) - Year 10	Cross-Curricular Strands
Key Learning Questions	NEA - Contextual Challenge	Reading
<ul style="list-style-type: none"> How will you document your progress through the NEA? What contextual challenge have you selected? What do you need to know/research/investigate to gather relevant information about the contextual challenge? Who is your user/client and what are their needs and wants? How will you communicate your ideas? How can you develop your idea(s) to meet the needs of the client/user? How will you make your prototype accurate and fit for purpose? How will you gather feedback and act upon it? What skills are you going to use from the previous years to complete this? 	<p>Practical application of:</p> <ul style="list-style-type: none"> Core technical principles Specialist technical principles Designing and making principles <p>How's it assessed:</p> <ul style="list-style-type: none"> Against against a set of criteria: <ul style="list-style-type: none"> Identifying and investigating design possibilities Producing a design brief and specification Generating design ideas Developing design ideas Realising design ideas Analysing & evaluating 100 marks 50% of GCSE <p>A series of contextual challenges will be released by AQA annually on 1st June (Year 10) Students will produce a prototype and a portfolio of evidence. Deadlines will be given to students, which they will need to meet.</p>	<ul style="list-style-type: none"> Reading client profiles. Reading and interpreting manufacturing instructions. Reading of written instructions. Reading and interpreting technical specifications. Reading and interpreting working drawings. Reading and interpreting designs.
Key Learning Questions	Unit 5 - Materials	Oracy and Literacy
<p>These key questions relate to the 5 material areas: papers and boards, timber based materials, metal based materials, polymers and textile based materials.</p> <ul style="list-style-type: none"> What are the sources, origins and properties of a variety of materials? 	<p>The following criteria relates to all the material areas studied for GCSE, which includes: papers & boards, timber based materials, metal based materials, polymers and textile based materials.</p> <ul style="list-style-type: none"> Identify the origin of the materials above. Describe the process of producing the finished materials. Explain how the sourcing of the materials impacts on the environment and how it is produced sustainably. Identify the factors that impact on the choice of materials. 	<p>Language for Learning Conceptual stages (of design), iterative design, physical properties, product, prototype, social footprint, social responsibility, stock form, user centred design, working properties, continuous improvement, energy generation, energy storage, smart and modern materials.</p>

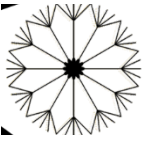


<ul style="list-style-type: none"> • How do you work with a variety of materials and fixings? • How are materials used in commercial manufacturing and what surface treatments and finishes are there? 	<ul style="list-style-type: none"> • Identify and describe the different stock forms, types and sizes of the materials above. • Explain different school and commercial based cutting, forming, drilling, casting, deforming, printing and processing techniques, tools and equipment. • Describe how materials are selected and processed for commercial products. • Describe/explain why aids are used to judge quality control and accuracy before and during processing • Describe/explain how surface treatments and finishes affect the functional and aesthetic properties of products.
<p>Key Learning Questions</p>	<p>Unit 2- Energy, materials, systems and devices</p>
<ul style="list-style-type: none"> • How is energy generated from fossil fuels, nuclear power and renewable energy sources? 	<ul style="list-style-type: none"> • Identify and describe the methods of energy generation, including fossil fuels, nuclear power and renewable energy sources (wind, solar, tidal, hydroelectric and biofuel).

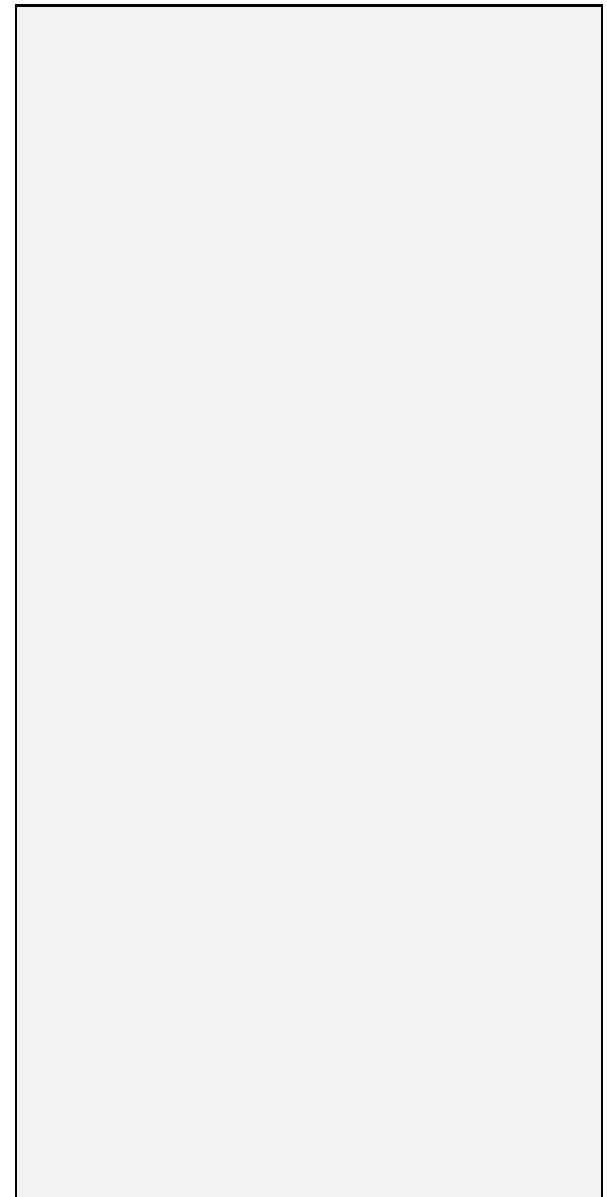
<p>Key terms</p> <p>Sources and origins, sustainability, aesthetics, stock form, workability, stability, creasing and folding, die cutting, laminating/encapsulation, CMYK, RGB, offset lithography, registration marks, crop marks, embossing, debossing, timber conversion, felling, veneer, deforestation, knock-down fittings, quality control, tolerances, casting, turning, milling, annealing, pressing, welding, hardening, tempering, fractional distillation, crude oil, thermoplastics, thermosetting, biodegradable, line bending, vacuum forming, 3D Printing, resin casting, injection moulding, extrusion, blow moulding, fibres, stitching, quilting, gathering, piping, anodising, fossil fuels, nuclear power, renewable energy, wind turbines, solar power, tidal energy, hydroelectric power, biofuel, pneumatics, hydraulics, kinetic energy, nanomaterials, input, process, output, ergonomics, anthropometrics, datum planes/points, tessellation.</p>
<p>Oracy</p> <p>Student discussion and student feedback when designing.</p> <p>Student responses to questions.</p> <p>Student to student discussion on evaluation of designs, prototypes and final products.</p>
<p>Numeracy</p>
<ul style="list-style-type: none"> • Measuring in mm. • Conversion of units. • Calculating surface areas - determining the quantity of materials required.

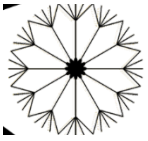


<ul style="list-style-type: none"> ● Why is it key to select the correct energy generation method? ● What are the different types of energy storage? ● How can modern materials be used to alter functionality? ● How does a smart material work? How would these materials be beneficial? ● What are the characteristics of a composite material and technical textiles? ● What are the principles of electronic systems? ● How can we use systems to analyse and solve a given problem? ● What is electronic system processing? ● Why are mechanical devices used to perform tasks and specific actions? 	<ul style="list-style-type: none"> ● Discuss the arguments for and against the selection of sources to generate energy. ● Identify what energy storage is. ● Describe pneumatics, hydraulics and how it produces kinetic energy. ● Describe the functional properties of alkaline and rechargeable batteries. ● Identify a range of modern materials. ● Describe a range of modern materials and the uses of these modern materials. ● Describe developments made through the invention of new or improved processes involving modern materials. ● Explain how modern materials can be used to alter functionality. ● Identify a range of smart materials. ● Describe how the functional properties of a range of smart materials can be changed by external stimuli. ● Explain how material properties can be enhanced by combining two or more materials. ● Identify a range of composite materials and technical textiles. ● Describe how fibres can be manipulated to create technical textiles. ● Describe the principles of electronic systems. ● Identify/describe different components used within an electronic system. ● Apply learned skills to use diagrams and flowcharts to analyse and solve a given problem. ● Identify/describe the difference between analogue and digital signals. ● Identify a range of movements. ● Describe the functions of mechanical devices to produce the range of movements. ● Describe how mechanisms (levers, linkages and rotary systems) can be used to change magnitude and direction of force. 	<ul style="list-style-type: none"> ● Calculating wastage - determining the quantity of materials required. ● Tessellation of shapes/products. ● Graphic presentation of design ideas and communication intentions to others. ● Analysis and presentation of data and client survey responses. ● Use of ratios, fractions and percentages - scaling drawings, analysing responses to user questionnaires. ● Handling data - construct and interpret tables and charts to present information.
<p>Key Learning Questions</p>	<p>Unit 6 - Designing principles</p>	
<ul style="list-style-type: none"> ● How can primary and secondary data be collected to assist the 	<ul style="list-style-type: none"> ● Identify how primary and secondary data can be collected to assist the understanding of client and user needs. 	



<p>understanding of client and user needs?</p> <ul style="list-style-type: none"> ● How is an effective design brief and specification written? ● What impact does the environmental, social and economical challenges have on designing and making? ● How does investigating the work of other designers and design companies inform designing? ● What design strategies are there that can help produce imaginative and creative design ideas? ● Why is it key to communicate design ideas and prototype developments? 	<ul style="list-style-type: none"> ● Apply learned skills to be able to write a design brief and produce a manufacturing specification. ● Explain how the environment, and social, and economic challenges influence designing and making. ● Be able to investigate, analyse and evaluate the work of others. ● Describe/explain how investigating the work of other designers and design companies can inform designing. ● Identify a range of design strategies that help produce imaginative and creative design ideas. ● Identify how to explore and develop design ideas. ● Identify/explain how to develop, communicate, record and justify design ideas. ● Apply learned skills to produce and communicate a range of imaginative and creative design ideas. ● Describe and apply learned skills of how to design and develop prototypes in response to client wants and needs.
<p>Key Learning Questions</p>	<p>Unit 7 - Making principles</p>
<ul style="list-style-type: none"> ● How does functionality, availability and cost affect the selection of materials and components? ● Why is it key that tolerances are applied during making activities? ● Why is effective design planning key to minimise waste? ● Why is material management and marking out important when manufacturing a product? ● Why do we apply surface treatments and finishes to products? 	<ul style="list-style-type: none"> ● Identify the characteristics that must be considered when selecting materials and components. ● Describe and explain how functionality, availability and cost affect the selection of materials and components. ● Describe how tolerances are used when manufacturing products. ● Explain the use of tolerances to ensure accuracy is considered when making a product. ● Explain why tolerances are applied during making activities. ● Explain why effective design planning can minimise waste, with the inclusion of design adaptations and tessellation. ● Calculate the surface area and quantity of required materials. ● Discuss the value of using measurement and marking out to create an accurate and quality prototype. ● Identify and characterise the appropriate tools and methods for marking out a range of materials. ● Select and use specialist tools, equipment, techniques and processes.





- Explain why surface treatments and finishes are applied to materials/products (including functional and aesthetic purposes).
- Apply learned skills to prepare different surfaces for treatments or finishes.
- Apply learned skills to select and apply appropriate surface treatments and finishes.