



Key Stage 4 Framework for Learning Year 10 2018-2019: Successful Foundations

Curriculum Area: Computing and Technology – GCSE Design and Technology



Year 10	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2		
Syllabus	AQA GCSE Design and Technology Specification Title 8552 50% Controlled Assessment 50% Examination		AQA GCSE Design and Technology Specification Title 8552 50% Controlled Assessment 50% Examination	AQA GCSE Design and Technology Specification Title 8552 50% Controlled Assessment 50% Examination	AQA GCSE Design and Technology Specification Title 8552 50% Controlled Assessment 50% Examination	AQA GCSE Design and Technology Specification Title 8552 50% Controlled Assessment 50% Examination		
Knowledge	New and Emerging Technologies The knowledge, understanding and skills that all students must develop are separated into: <ul style="list-style-type: none"> • Core Technical principles • Specialist Technical principles Designing and making principles During this half term student's will focus on: New and emerging technologies. In relation to this student's will complete project based tasks and knowledge will center around: <ul style="list-style-type: none"> • The impact of new and emerging technologies on: <ul style="list-style-type: none"> ○ The design and organisation of the workplace ○ including automation and the use of robotics ○ buildings and the place of work ○ tools and equipment. • Enterprise based on the development of an 	Energy Generation and Storage The knowledge, understanding and skills that all students must develop are separated into: <ul style="list-style-type: none"> • Core Technical principles • Specialist Technical principles • Designing and making principles During this half term student's will focus on: Energy Generation and Storage In relation to this student's will complete learning tasks and knowledge will center around: <ul style="list-style-type: none"> • How power is generated from: <ul style="list-style-type: none"> ○ coal ○ gas ○ oil. • Arguments for and against the selection of fossil fuels. • How nuclear power is generated. • Arguments for and 	ELE – 1 Day:	Industrial Processes and Manufacturing Techniques The knowledge, understanding and skills that all students must develop are separated into: <ul style="list-style-type: none"> • Core Technical principles • Specialist Technical principles • Designing and making principles During this half term student's will focus on: Industrial processes and Manufacturing Techniques In relation to this student's will complete learning tasks and knowledge will center around: <p>Tools and Equipment (including machinery)</p> <ul style="list-style-type: none"> • Vacuum forming • Creasing • Pressing • Drape forming • Bending • Folding • Blow moulding 	Year 10 Work Experience – 2 Weeks	The work of others The knowledge, understanding and skills that all students must develop are separated into: <ul style="list-style-type: none"> • Core Technical principles • Specialist Technical principles • Designing and making principles During this half term students will focus on: The work of others. In relation to this student's will complete project based tasks and knowledge will center around: <ul style="list-style-type: none"> • Research into the work of past and present designers and companies to inform their own designing. • Research into the work of past and present design movements and trends and how these have developed the design for products in a variety of industries. • Design strategies 	REVISION for Summer term assessment The knowledge, understanding and skills that all students must develop are separated into: <ul style="list-style-type: none"> • Core Technical principles • Specialist Technical principles • Designing and making principles During this half term student will focus on revision topics and exam preparation in preparation for the examination (50% of final grade). Students will be reviewing the topics outlined below; <ul style="list-style-type: none"> • Investigation, primary and secondary data • Environmental, social and economic challenge • The work of others • Design strategies • Communication of design ideas • Prototype development • Selection of materials and components • Tolerances • Material management 	NEA Task start Throughout the course of NEA task being completed this term (having been started at the end of Summer 2) there are a number of key knowledge areas that students will have to apply to their learning and evidence in a portfolio of work including in: <ul style="list-style-type: none"> • Core technical principles New and emerging technologies Energy generation and storage Developments in new materials Systems approach to designing Mechanical devices Materials and their working properties • Specialist technical principles Selection of materials or components Forces and stresses Ecological and social footprint Sources and origins of materials Using and working with materials Stock forms, types and sizes



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	<p>effective business innovation:</p> <ul style="list-style-type: none"> ○ crowd funding ○ virtual marketing and retail ○ co-operatives ○ fair trade. <ul style="list-style-type: none"> • How technology push/market pull affects choice. • Changes in fashion and trends in relation to new and emergent technologies. • Respecting people of different faiths and beliefs. • How products are designed and made to avoid having a negative impact on others: <ul style="list-style-type: none"> ○ design for disabled ○ elderly ○ Different religious groups. 	<p>against the selection of nuclear power.</p> <ul style="list-style-type: none"> • How power is generated from: <ul style="list-style-type: none"> ○ Wind ○ Solar ○ Tidal ○ Hydro-electrical ○ Biomass. • Arguments for and against the selection of renewable energy. • Kinetic pumped storage systems. • Alkaline and re-chargeable batteries. • The impact of resource consumption on the planet: <ul style="list-style-type: none"> ○ finite ○ non-finite ○ disposal of waste. • Positive and negative impacts new products have on the environment: <ul style="list-style-type: none"> ○ continuous improvement ○ efficient working ○ pollution ○ Global warming. 	<ul style="list-style-type: none"> • Casting • Injection moulding • Extrusion. <p>Commercial Processes:</p> <ul style="list-style-type: none"> • Papers and boards (offset lithography and die cutting). • Timber based materials (routing and turning). • Metal based materials (milling and casting). • Polymers (injection molding and extrusion). • Textile based materials (weaving, dyeing and printing). • Electrical and mechanical systems (pick and place assembly and flow soldering). 	<ul style="list-style-type: none"> • Communication of design ideas • Prototype development 	<ul style="list-style-type: none"> • Specialist tools and equipment • Specialist techniques and processes 	<p>Scales of production Specialist techniques and processes Surface treatments and finishes</p> <p>Materials (Relevant to NEA task being completed)</p> <ul style="list-style-type: none"> ○ Papers and boards ○ Timber based materials ○ Metal based materials ○ Polymers ○ Textile based materials ○ Electronic and mechanical systems <ul style="list-style-type: none"> • Designing and making principles Investigation, primary and secondary data Environmental, social and economic challenge The work of others Design strategies Communication of design ideas Prototype development Selection of materials and components Tolerances Material management Specialist tools and equipment Specialist techniques and processes
<p>Skills</p>	<p>Throughout theory lessons in GCSE Design and Technology students will learn skills which will allow them to develop their understanding of information in order to answer a range of exam questions and prepare them for NEA (Non Examined Assessment) tasks starting at the end of Year 10.</p> <p>Students will learn how to break down and apply</p>	<p>Throughout theory lessons in GCSE Design and Technology students will learn skills which will allow them to develop their understanding of information in order to answer a range of exam questions and prepare them for NEA (Non Examined Assessment) tasks starting at the end of Year 10.</p> <p>Students will learn how to break down and apply</p>	<p>Throughout theory lessons in GCSE Design and Technology students will learn skills which will allow them to develop their understanding of information in order to answer a range of exam questions and prepare them for NEA (Non Examined Assessment) tasks starting at the end of Year 10.</p> <p>Students will learn how to break down and apply</p>	<p>Students will need to apply the core and specialist technical principles and design and making principles for the topics being studied.</p> <p>Specification: Students will develop their skills in writing a list of design requirements (specification) for their product following a set design brief. This will require students to consider a range of a reas</p>	<p>As well as exploring a range of revision strategies and techniques in Design and Technology students will be looking at developing their ability to answer a range of examination questions and question styles including how to answer:</p> <ul style="list-style-type: none"> • Section A - A mixture of multiple choice and short answer questions assessing a breadth of technical knowledge and understanding 	<p>The NEA project in its entirety should take between 30-35 hours to complete and consist of a working prototype and a concise portfolio of approximately 20 pages of A3 paper.</p> <p>Students must demonstrate sufficient skills in applying the above knowledge to the six assessment areas;</p> <ul style="list-style-type: none"> • Researching and investigating (A) • Writing a design brief



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	<p>information in order to answer a variety of exam questions on the topic.</p> <p>Students will undertake tasks that will develop their ability to research and investigate and then apply that information in a wider context.</p> <p>Students will look at ways to evaluate and critically discuss topics considering different viewpoints (advantages and disadvantages). This will benefit them when completing both NEA and examination tasks throughout the course.</p> <p>Students will need to develop techniques for extended writing, ways to evaluate and critically discuss topics considering different viewpoints especially in relation to writing about advantages and disadvantages (which will be developed NEA and examination tasks throughout the course.).</p> <p><i>Skills to also include:</i></p> <ul style="list-style-type: none"> • Extended writing • Competing tables and graphs • Descriptive writing • Revision techniques • Reading questions • Sketching and designing 	<p>information in order to answer a variety of exam questions on the topic.</p> <p>Students will undertake tasks that will develop their ability to research and investigate and then apply that information in a wider context.</p> <p>Students will look at ways to evaluate and critically discuss topics considering different viewpoints (advantages and disadvantages). This will benefit them when completing both NEA and examination tasks throughout the course.</p> <p>Students will need to develop techniques for extended writing, ways to evaluate and critically discuss topics considering different viewpoints especially in relation to writing about advantages and disadvantages (which will be developed NEA and examination tasks throughout the course.).</p> <p><i>Skills to also include:</i></p> <ul style="list-style-type: none"> • Extended writing • Competing tables and graphs • Descriptive writing • Revision techniques • Reading questions • Sketching and designing 	<p>information in order to answer a variety of exam questions on the topic.</p> <p>Students will undertake tasks that will develop their ability to research and investigate and then apply that information in a wider context.</p> <p>Students will look at ways to evaluate and critically discuss topics considering different viewpoints (advantages and disadvantages). This will benefit them when completing both NEA and examination tasks throughout the course.</p> <p>Students will need to develop techniques for extended writing, ways to evaluate and critically discuss topics considering different viewpoints especially in relation to writing about advantages and disadvantages (which will be developed NEA and examination tasks throughout the course.).</p> <p><i>Skills to also include:</i></p> <ul style="list-style-type: none"> • Extended writing • Competing tables and graphs • Descriptive writing • Revision techniques • Reading questions • Sketching and designing 	<p>including design, function, materials, user etc.</p> <p>Design: Students will generate ideas for their Automata toy creating solutions to their written specification. Design techniques will be shown through the use of 2D and 3D design as well as how to annotate and render a design idea.</p> <p>Other skills linked to design tasks could include:</p> <ul style="list-style-type: none"> • Design and develop prototypes in response to client wants and needs. • Select and use materials and components appropriate to the task considering functional need, cost and availability. • Use appropriate marking out methods, data points and coordinates • Select and use specialist techniques and processes appropriate for the material and/or task and use them to the required level of accuracy in order to complete quality outcomes. 	<ul style="list-style-type: none"> • Section B - Several short answer questions (2–5 marks) and one extended response to assess a more in depth knowledge of technical principles • Section C - A mixture of short answer and extended response questions. <p>Preparations to also include:</p> <ul style="list-style-type: none"> • Extended writing • Competing tables and graphs • Descriptive writing • Revision techniques • Reading questions • Sketching and designing 	<p>(B)</p> <ul style="list-style-type: none"> • Generating ideas (C) • Developing ideas (D) • Realizing an idea (E) • Reflecting and evaluating (F) <p>Alongside the areas assessed and the skills that are demonstrated in these categories, students' needs to show independence, creativity and analytical thinking skills throughout the NEA task.</p>
Assessment	<p>Marking Point 1 Piece of classwork: Research analysis task based on the development of industry and how this has impacted the availability of product for a consumer (to also consider</p>	<p>Marking Point 1 Piece of classwork: Research analysis task based on the impact of nuclear energy on local environments (such as people and communities as well as</p>	<p>Marking Point 1 Research analysis task based on the development of manufacturing techniques and its impact on society.</p>	<p>Marking Point 1 Research analysis task based on the work of a designer who has influenced a specific industry.</p> <p>Marking Point 2</p>	<p>Assessment tasks for this half term will solely focus on practice exam questions and marked in line with exam mark schemes which will help support the students prior to the final exam.</p>	<p>Marking Point 1 AO1 Section A: initial analysis and Problem identified (10 Marks Available)</p> <p>Marking Point 2 AO2 Section A: Analysis of Existing Products (10 Marks</p>



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	<p>ease of access/availability)</p> <p>Marking Point 2 Piece of Classwork: Students will be assessed on a piece of classwork which develops their understanding of an enterprise technique such as crowdfunding and create their own proposal that could be launched online.</p> <p>Marking Point 3 Homework Assignment Students will be assessed on a piece of home learning which will look at the impact of fair trade products on local communities, growers and farmers.</p>	<p>environmental)</p> <p>Marking Point 2 Exam question – extended answer linked to the energy generation – students will be assessed on their response to the question and feedback given on the breadth of their answer linked to a mark scheme.</p> <p>Marking Point 3 Homework Assignment Students will be assessed on a piece of home learning which will look at how the storage of energy has evolved (batteries) and the reasons behind this.</p>	<p>Marking Point 2 Home learning task, this will be set with a focus on a specific manufacturing technique and commercial process such as extrusion moulding.</p> <p><i>(4 week term, no 3rd marking point)</i></p>	<p>Assessed piece will focus on the design ideas generated from one of the designs created following a set brief.</p> <p>Marking Point 3 Home Learning tasks linked to the work of a suitable designer, design movement or company.</p>	<p>Examination questions and sample questions will be used to help familiarize students with the examination format and the methods of marking used by examiners.</p> <p>Students will unpick the mark schemes as well as possible responses to questions to structure the answers to the marks available.</p>	<p>Available)</p> <p>Marking Point 3 A02 Section A: Client Profile (10 Marks Available)</p> <p><i>Feedback to students will be provided in line with the AQA NEA guidelines and specification requirements in order to comply with exam board regulations.</i></p>
<p>Cultural Enrichment</p>	<p>READ There are a number of resources students can use to develop their knowledge and understanding of topics covered in lessons (NEA) and in preparation for examinations.</p> <ul style="list-style-type: none"> • PG online GCSE Design and Technology (1-9) text book • www.technologystudent.com • www.gcsepod.co.uk • www.bbcbitesize.co.uk <p>WATCH Students will need to have an understanding of manufacturing methods and techniques. Students can investigate these linked to the material area they are focusing through You Tube. This will form ongoing research if evidenced in their portfolios.</p> <p>When studying independently and</p>	<p>READ There are a number of resources students can use to develop their knowledge and understanding of topics covered in lessons (NEA) and in preparation for examinations.</p> <ul style="list-style-type: none"> • PG online GCSE Design and Technology (1-9) text book • www.technologystudent.com • www.gcsepod.co.uk • www.bbcbitesize.co.uk <p>WATCH Students will need to have an understanding of manufacturing methods and techniques. Students can investigate these linked to the material area they are focusing through You Tube. This will form ongoing research if evidenced in their portfolios.</p>	<p>READ There are a number of resources students can use to develop their knowledge and understanding of topics covered in lessons (NEA) and in preparation for examinations.</p> <ul style="list-style-type: none"> • PG online GCSE Design and Technology (1-9) text book • www.technologystudent.com • www.gcsepod.co.uk • www.bbcbitesize.co.uk <p>WATCH Students will need to have an understanding of manufacturing methods and techniques. Students can investigate these linked to the material area they are focusing through You Tube. This will form ongoing research if evidenced in their portfolios.</p> <p>When studying</p>	<p>READ There are a number of resources students can use to develop their knowledge and understanding of topics covered in lessons (NEA) and in preparation for examinations.</p> <ul style="list-style-type: none"> • PG online GCSE Design and Technology (1-9) text book • www.technologystudent.com • www.gcsepod.co.uk • www.bbcbitesize.co.uk <p>WATCH Students will need to have an understanding of manufacturing methods and techniques. Students can investigate these linked to the material area they are focusing through You Tube. This will form ongoing research if evidenced in their portfolios.</p> <p>VISIT</p>	<p>READ There are a number of resources students can use to develop their knowledge and understanding of topics covered in lessons (NEA) and in preparation for examinations.</p> <ul style="list-style-type: none"> • PG online GCSE Design and Technology (1-9) text book • www.technologystudent.com • www.gcsepod.co.uk • www.bbcbitesize.co.uk <p>WATCH Students will need to have an understanding of manufacturing methods and techniques. Students can investigate these linked to the material area they are focusing through You Tube. This will form ongoing research if evidenced in their portfolios.</p> <p>VISIT</p>	<p>READ There are a number of resources students can use to develop their knowledge and understanding of topics covered in lessons (NEA) and in preparation for examinations.</p> <ul style="list-style-type: none"> • PG online GCSE Design and Technology (1-9) text book • www.technologystudent.com • www.gcsepod.co.uk • www.bbcbitesize.co.uk <p>WATCH Students will need to have an understanding of manufacturing methods and techniques. Students can investigate these linked to the material area they are focusing through You Tube. This will form ongoing research if evidenced in their portfolios.</p> <p>VISIT There is a wealth of opportunities for students to independently go and visit</p>



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	<p>investigating the topics covered this term the following key terms could be used as search terms:</p> <ul style="list-style-type: none"> • crowd funding • virtual marketing and retail • co-operatives • fair trade. • technology push • market pull affects choice. • design for disabled/elderly <p>VISIT There is a wealth of opportunities for students to independently go and visit areas of interest or art galleries and museums across the city. These opportunities should be discussed with their teacher who can support students.</p>	<p>When studying independently and investigating the topics covered this term the following key terms could be used as search terms:</p> <ul style="list-style-type: none"> • coal • gas • oil. • Wind • Solar • Tidal • Hydro-electrical • Biomass. • finite • non-finite • disposal of waste. • pollution • Global warming. <p>VISIT There is a wealth of opportunities for students to independently go and visit areas of interest or art galleries and museums across the city. These opportunities should be discussed with their teacher who can support students.</p>	<p>independently and investigating the topics covered this term the following key terms could be used as search terms:</p> <ul style="list-style-type: none"> • Vacuum forming • Creasing • Pressing • Drape forming • Bending • Folding • Blow moulding • Casting • Injection moulding • Extrusion. <p>VISIT There is a wealth of opportunities for students to independently go and visit areas of interest or art galleries and museums across the city. These opportunities should be discussed with their teacher who can support students.</p>	<p>There is a wealth of opportunities for students to independently go and visit areas of interest or art galleries and museums across the city. These opportunities should be discussed with their teacher who can support students.</p>	<p>There is a wealth of opportunities for students to independently go and visit areas of interest or art galleries and museums across the city. These opportunities should be discussed with their teacher who can support students.</p>	<p>areas of interest or art galleries and museums across the city. These opportunities should be discussed with their teacher who can support students.</p>
<p>Character</p>	<p>Q of S Optimism</p>  <p>Optimism: Students will be encouraged to reflect on their progress throughout each term and establish targets for development. Students will also be encouraged to develop their skills and work to progress beyond their target level by enriching their understanding of the</p>	<p>Q of S Empathy</p>  <p>Empathy: topics covered this term link closely to impacts on society and therefore students will be encouraged to think about the local community and environmental impact of a range of issues surrounding Industry and</p>	<p>   </p> <p>QofS – Creativity & Curiosity</p> <p>Creativity: During lessons students will be allowed to display work in any way that they wish and which they feel will enhance their ability to retain the knowledge acquired within the lessons.</p> <p>Curiosity:</p>	<p>   </p> <p>QofS – Responsibility & Reflection</p> <p>Responsibility: Students will explore ways in which designers and manufactures have responsibility to their clients and manufacturers in industry/society when creating products, this includes following health and safety regulations</p>	<p>   </p> <p>QofS – Practice & Resiliency</p> <p>Practice: Students will spend time preparing for a summer term assessment and through revision activities will complete a series of practice questions which enable them to consider how to structure exam answers suitably.</p>	<p>  </p> <p>Q of S - Motivation</p> <p>Motivation: Like most topics being covered throughout the academic year in relation to materials students will undertake a range of sampling and practice practical tasks. An essential part of completing the work is for the students to show self-motivation.</p>



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	<p>topics being covered this half term.</p>	<p>Enterprise as well as look at examples of disastrous situations when Nuclear energy generation goes wrong.</p>	<p>Students will be exploring and investigating a range of the manufacturing techniques used across a range of different industries as well as commercially processes used to develop efficient manufacturing systems.</p>	<p>when designing and considering the needs of a specific client. (Human Factors in design).</p> <p>Reflection: As students work through a series of design tasks they will be expected to annotate and evaluate their design ideas considering the needs of the brief that has been assigned to them as well as the usage of materials to potentially manufacture their products and methods of manufacture.</p>	<p>Resiliency: Students will be asked to consider the marks they have achieved for previous progress tests and individual assessment pieces of, identifying what they did wrong and right, setting themselves personal targets to move their learning forward showing resiliency and the ability to act on suggestions offered and feedback.</p>	
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