

## YEAR 10 ENGINEERING: CURRICULUM INTENT 2020 2021

	Project	Topics	Knowledge and skills	Cultural capital	Rationale
<b>Year 10</b>	<b>Term 1: Rechargeable torch</b>	-Inclusive design: ergonomics and anthropometrics -Designing products using 3D CAD (Solidworks)	-How does ergonomics influence product design? -How is anthropometric data used during the design process?	-What is inclusive design? -How are common products designed to suit the needs of a range of users? -How has Computer Aided Design evolved? -How has it influenced product design?	<p><b>-Exploring new theory topics in preparation for the R105 written exam...</b> Embedded into the projects in our year 10 curriculum are opportunities for the students to explore several of the topics which form the basis of the R105 exam. The students gain a good understanding of these key concepts as they apply them to their own project work.</p> <p><b>-Learning how to analyse products in order to complete the R106 exam unit...</b> The R106 product analysis task set by the exam board forms a key part of our year 10 curriculum. The students explore how products are manufactured in industry as they disassemble existing products to gain an understanding of how materials, components, processes and techniques are selected.</p>
	<b>Term 2: Torch analysis</b>	-Unit R106 – Product analysis	-Torch material and component identification -Torch comparison-strengths and weaknesses -Torch disassembly-material and component identification -Investigating the manufacturing techniques used -Exploring the environmental impact of the torches Exploring how the torches compare to the 6 R's of sustainability -Considering the impact of legislation, quality and safety standards	-How are products manufactured in industry? -How has lighting technology evolved? -How do products impact on the environment? -What is the impact of legislation and quality standards?	
	<b>Term 3: Gadget tidy</b>	-3D Drawing techniques -Metal machining processes	-2D and 3D drawing techniques. -Traditional and CAD methods of drawing. -Effective use of 2D and 3D CAM -Exploring metal machining techniques.	-How has rapid prototyping been of benefit to society?	<p><b>-Laying the foundations for the R107 and R108 units in year 11...</b> The projects in our year 10 curriculum have been structured in such a way that students learn how to work independently to manage a project from the initial research stages, through development and into the manufacturing and final evaluation. The students will need to draw on these key skills as they move into year 11 and tackle the R107 and R108 design, development and manufacturing tasks.</p>
	<b>1 Lesson per fortnight: Exam practice/theory activities</b>	-Understanding the design cycle and the relationship between design briefs and specifications. -Understanding the requirements of design specifications for the development of new products.	-What is the design cycle? -What is a design brief? -How is a design brief used? -What is a specification? -How do the brief and specification relate? -What are the requirements of products?	-What makes good design? -Case study: Great design successes and design failures. -What impact has the evolution of products had on society?	

## YEAR 10 DESIGN & TECHNOLOGY: CURRICULUM INTENT 2020 2021

	Project	Topics	Knowledge and skills	Cultural capital	Rationale
<b>Year 10</b>	<b>Term 1: Co-ordination game</b>	<ul style="list-style-type: none"> <li>-Exploring SMART and modern materials</li> <li>-Exploring compliant materials (paper and board)</li> <li>-Exploring control technology</li> </ul>	<ul style="list-style-type: none"> <li>-What are SMART and modern materials?</li> <li>-How are SMART and modern materials used in products?</li> <li>-Embedding control technology</li> <li>-From the traditional control circuit to the programmable device (BBC Microbit)</li> </ul>	<ul style="list-style-type: none"> <li>-What impact has technology had on the development of children?</li> <li>-How do toys help children develop?</li> <li>-What is a sustainable product?</li> </ul>	<p><b>-Gaining confidence in using the design process...</b> During year 10 we move away from supporting students with templates and towards the students learning how to present their work effectively by hand and using computer software.</p> <p><b>-Embedding the theory topics...</b> Students are required to apply newly learnt theory as they work from design briefs to solve real life design problems.</p> <p><b>-Launching the final NEA task...</b> Following the launch of the design themes for the NEA in June the students begin to explore the topics set. In the lead up to the summer break the students work independently to explore each topic before identifying a focus for their project.</p>
	<b>Term 2: Computer mouse design project</b>	<ul style="list-style-type: none"> <li>-Designing inclusive products</li> <li>-Exploring modelling techniques</li> </ul>	<ul style="list-style-type: none"> <li>-What is inclusive design?</li> <li>-How are ergonomics and anthropometrics used in the design of products?</li> <li>-How can modelling techniques be used in the development of products?</li> </ul>	<ul style="list-style-type: none"> <li>-What impact has the microcontroller had on society?</li> <li>-Case study: From the first computer to the fully embedded technology of today's society.</li> </ul>	
	<b>Term 3: NEA Themes released</b>	<p>NEA: Section 1 – Exploring and investigating design possibilities.</p> <ul style="list-style-type: none"> <li>-Exploring a theme</li> <li>-Working from a design brief</li> <li>-Researching and investigating</li> <li>-Exploring design concepts</li> </ul>	<ul style="list-style-type: none"> <li>-How do you explore a theme?</li> <li>-How do you write a design brief?</li> <li>-How are primary and secondary sources used in research?</li> <li>-What are the design possibilities?</li> </ul>	<ul style="list-style-type: none"> <li>-The NEA focusses of working from a design brief set by a real client. Students must respond to client feedback throughout their project to ensure their designs meet the needs of the end user.</li> </ul>	
	<b>1 Lesson per fortnight: Exam practice/theory activities</b>	<ul style="list-style-type: none"> <li>-Exam practice</li> <li>-Key ideas in Design &amp; Technology</li> <li>-An introduction to materials and systems</li> </ul>	<ul style="list-style-type: none"> <li>-What are the main material categories?</li> <li>-What examples are there for each material area?</li> <li>-What are the properties and applications of these materials?</li> </ul>	<ul style="list-style-type: none"> <li>-Throughout this section of the course the emphasis is on real world applications for each material. Students will carry out case studies of common products this will help them put their newly acquired knowledge into context.</li> <li>-There are several opportunities to discuss the environmental impact how ethical our use of the materials is.</li> </ul>	

# YEAR 10 GCSE FOOD AND NUTRITION: CURRICULUM INTENT 2020 2021

	Project	Topics	Knowledge and skills	Cultural capital	Rationale
<b>Year 10</b>	<b>Term 1:</b>	<ul style="list-style-type: none"> <li>-food safety</li> <li>-food commodities</li> <li>- diet and good health</li> </ul>	<ul style="list-style-type: none"> <li>-Preparing and cooking foods</li> <li>-hand washing</li> <li>-food poisoning bacteria</li> <li>- Food labelling</li> <li>- accident prevention/ HACCP</li> <li>- Fruit and vegetables- seasons</li> <li>- harvesting</li> <li>- proteins/beans and pulses</li> <li>- nutritional needs throughout life.</li> </ul>	Students will incorporate their knowledge gained from the lessons in to their lives. As food is essential in life, anything we discuss will help them make sure they can prevent food poisoning and personal injury.	<p><b>-Gaining key knowledge needed for their written exam..</b> In this year students will gain their knowledge for their practical exam the following year through a mix of theory lessons and practical.</p> <p><b>-Learning how to create a report..</b>students have to create a report for both their NEA 1 and 2. They will learn how to research, analyse and present their work, making sure it is factual and to the point.</p>
	<b>Term 2:</b>	<ul style="list-style-type: none"> <li>-Food production</li> <li>-Food Provenance</li> <li>-Science of food</li> </ul> <p>NEA1 task</p>	<ul style="list-style-type: none"> <li>-Understanding where food is made and come from.</li> <li>-sustainability</li> <li>-intensive farming</li> <li>-packaging</li> <li>-food waste</li> <li>-Household waste</li> </ul> <p>Students are given an example of nea1. The students will then create a scientific experiment and a report based on a topic. The students will practice this to help them for their GCSE starting in September.</p>	Students will understand how to be more sustainable with their food, where it is sourced from, learning about farming, packaging production, how to reduce food waste.	
	<b>Term 3:</b>	NEA2 task	Create 3 dishes related to a task.	<p>The aim is for students to create 3 dishes related to a task.</p> <p>The students have to research the task, practice 3 dishes and adapt them to make them more complex and evaluate how it's completed and if it fits the brief.</p> <p>This gets students to know the skill levels for dishes and creating food from scratch.</p>	

# YEAR 11 GCSE DESIGN & TECHNOLOGY: CURRICULUM INTENT 2020 2021

	Project	Topics	Knowledge and skills	Cultural capital	Rationale
<b>Year 11</b>	<b>Term 1:</b>	<p><b>NEA: Controlled assessment task</b></p> <ul style="list-style-type: none"> <li>-Identifying and investigating design possibilities</li> <li>-Producing a design brief and specification</li> <li>-Generating design ideas</li> <li>-Developing a design ideas</li> </ul> <p><b>Core specialist principles...</b></p> <ol style="list-style-type: none"> <li>1.Key ideas in Design &amp; Technology</li> <li>2.An introduction to materials and systems</li> <li>3.Properties and selection of materials</li> <li>4.Woods, Metals and Polymers</li> <li>5.Designing and making principles</li> </ol>	<p><b>Exploring theory topics...</b></p> <ul style="list-style-type: none"> <li>-What are the key ideas in Design &amp; Technology?</li> <li>-What are the main materials and systems used in Design and Technology?</li> <li>-What are the properties of the materials? How do these properties influence the selection of materials for different applications?</li> </ul> <p><b>Applying their skills...</b></p> <p>Theory and coursework based lessons run side by side throughout term 1 and students have the opportunity to apply their new knowledge and skills in their own independent projects.</p>	<p><b>Making historical links...</b></p> <p>There are opportunities throughout the theory to make links back to the past as students consider the origins of materials, processes, their applications and how they have evolved.</p> <p><b>Relating the learning back to real life experiences...</b></p> <p>To improve the students understanding of new topics students are encouraged to consider real life applications and experiences that they have witnessed first-hand.</p> <p><b>Making links with current affairs...</b></p> <p>The introduction of new topics and concepts are often supported by making links with current affairs and topical debate. Students are encouraged to consider the impact our use of resources, technology and manufacturing has on the world around us.</p> <p><b>Applying the learning...</b></p> <p>Students gain a better understanding of the new knowledge they have been taught as they are encouraged to apply what they have learnt to solve problems in their independent projects.</p>	<p><b>A focus on the NEA controlled assessment task...</b></p> <p>The students make an immediate start on their projects following the release of the set task from the exam board at the end of year 10. They start year 11 having completed the identifying and exploring design possibilities section of their projects. During the first term in year 11 students complete the producing a design brief/specification and development sections of their project before moving onto the realising, analysing and evaluating sections in the second term.</p> <p><b>The final assessment...</b></p> <p>The students must complete their NEA tasks by the February half term ready for final assessment.</p>
	<b>Term 2:</b>	<p><b>NEA: Controlled assessment task (completion and final assessment)</b></p> <ul style="list-style-type: none"> <li>-Realising a design solution</li> <li>-Analysing and evaluating</li> </ul> <p><b>Specialist technical principles...</b></p> <ul style="list-style-type: none"> <li>-Exploring woods, metals and polymers</li> </ul>	<p><b>Exploring theory topics...</b></p> <ul style="list-style-type: none"> <li>-What are working properties of Woods, Metals and Polymers?</li> <li>-What are the key designing and making principles?</li> </ul>		<p><b>Exploring the theory topics...</b></p> <p>During year 10 the students explored a range of materials and their working properties which gave them a sound understanding on which to build in year 11. Throughout year 11, one lesson a week is dedicated to learning new theory exam practice in the lead up to the final exam in June.</p>
	<b>Term 3:</b>	<b>Final written exam</b>			

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<b>Year 11</b>	Term 1:	<p><b>R105 Exam preparation...</b>                      -The design cycle                      -Identification of design needs                      -The relationship between the design brief and specification                      -Requirements of a design specification                      -Wider influences on new products</p> <p><b>R106 Product analysis and research (completion and final assessment for November)</b></p> <p><b>R107 Developing and presenting engineering designs</b></p>	<p><b>Exploring the design process...</b>                      -What is the design cycle?                      -What are the needs of the client/user?                      -How do the design brief and specification relate?                      -What are the requirements of the design specification?                      -How does the design process influence the development of products?</p>	<p><b>Applying the learning...</b>                      Students gain a better understanding of the new knowledge they have been taught in preparation for the R105 exam as they are encouraged to apply what they have learnt to solve problems in their independent projects.</p> <p><b>Practical application of knowledge and skills...</b>                      The students have the opportunity to work independently to apply what they have learnt in real life situations as they work through the design process to solve problems.</p>	<p><b>Preparing for the final R105 written exam...</b>                      During the first half term one lesson a week will be dedicated to practice for the R105 external exam. Students will have the opportunity to recap on the topics they explored in year 10 and apply what they have learnt to exam questions in the lead up to the written exam in January.</p> <p><b>Completing the R106 units ready for final assessment...</b>                      Students will have the opportunity to review and reflect on the work they completed in year 10 for the R106 product analysis unit and prepare their project work ready for final assessment.</p> <p><b>Working from the design brief to design and develop the final product (R107)...</b>                      To balance the curriculum and vary the content of lessons the students will also focus on the design/development sections of their coursework project assignment as part of the R107 unit.</p> <p><b>Manufacturing the final product (R108)...</b>                      As the students move into the second term they put the planning that they did in the first term into practice as they realise their final ideas and manufacture their final products.</p> <p><b>An opportunity to re-sit the R105 final exam...</b>                      In the final term there will be an opportunity for the students who did not pass the R105 written exam to re-sit the paper in June.</p> <p><b>The final assessment...</b>                      Students must complete their R107 and R108 units by February half term ready for final assessment ahead of the May assessment window.</p>
	Term 2:	<p><b>R105 external exam (January)</b>  <b>R107 Developing and presenting engineering designs (continued)</b>  <b>R108 3D Design realisation</b></p>	<p><b>Applying the new learning...</b>                      The students have the opportunity to apply what they have learnt in preparation for the R105 exam as they work through the design process to solve real life problems as part of the R107 section of their projects.</p>	<p><b>Making links with industry and the engineering sector...</b>                      Real life case studies are frequently used in lessons to make links back to the real world, giving the students a better understanding of where the areas they have explored in lessons are applied in industry.</p>	
	Term 3:	<p><b>R108 3D Design realisation (continued)</b>  <b>R105 resit opportunity (June)</b>  <b>R107 and R108 final assessment June</b></p>	<p><b>Practical application of new knowledge and skills...</b>                      The students draw on the knowledge and skills they gained during the year 10 projects and learning about the design process as they manufacture their final products</p>		

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<b>Year 11</b>	<b>Term 1:</b>	NEA 1	Using their knowledge gained from the previous year, students will create their scientific experiment related to the task. They will use their report writing skills that they learnt from previous years and in English lessons too.	<p><b>Task 1:</b> Food investigation (30 marks)</p> <p>Students' understanding of the working characteristics, functional and chemical properties of ingredients.</p> <p>Practical investigations are a compulsory element of this NEA task.</p>	<p>Starting the year the students are given their first NEA brief. They will then produce their report basing it around their brief. They will use research and practical skills to prove their hypothesis for a scientific experiment or explain how their hypothesis was incorrect.</p> <p>This can be written or electronic and has to be between 1500 and 2000 words including photographic evidence of the practical.</p>
	<b>Term 2:</b>	NEA 2	Students will create 3 dishes in 3 hours related to a chosen task.	<p><b>Task 2:</b> Food preparation assessment (70 marks)</p> <p>Students' knowledge, skills and understanding in relation to the planning, preparation, cooking, presentation of food and application of nutrition related to the chosen task.</p> <p>Students will prepare, cook and present a final menu of three dishes within a single period of no more than three hours, planning in advance how this will be achieved.</p>	<p>Once this is complete the second stage is completing their NEA2. This includes creating 6 dishes in total linked to a brief. Students will research the task, narrow down the choices to create 3 dishes. They then have to adapt these dishes to make them harder in a 3 hour practical. Students then evaluate how their practical went and if it links back the original brief.</p> <p>Once these are completed they revise the topics that might appear on their exam. They will learn about revision techniques, talk about areas that they are unsure of, complete mock exams and break down questions to help maximise marks as the exam is worth half of the total grade.</p>
	<b>Term 3:</b>	Revision		Looking back over all of the information gained over the last 3 years in preparation for their exam.	

## YEAR 12 A LEVEL DT-PRODUCT DESIGN: CURRICULUM INTENT 2020 2021

	Project	Topics	Knowledge and skills	Cultural capital	Rationale
<b>Year 12</b>	<b>Term 1:</b>	<b>Designing and making principles...</b> -Design methods and processes	<b>Exploring theory topics...</b> -Design theory -Technical and cultural changes -Design processes -Critical analysis and evaluation -Selecting appropriate tools, equipment and processes	<b>Practical application of knowledge and skills...</b> The students have the opportunity to work independently to apply what they have learnt in real life situations as they work through the design process to solve problems.	<b>Exploring theory topics...</b> Throughout year 12, one lesson a week is devoted to learning new theory and exam practice. Designing and making principles is the focus of theory lessons as this will support the students in completing the independent projects that the students are completing as part of the controlled assessment.  <b>Making headway on the independent coursework project...</b> The independent coursework project is the main focus during the first year of the course. Students use dedicated coursework based lessons to work through their own unique projects as part of the controlled assessment element of the course.  <b>Laying the foundations for year 13...</b> By the end of year 12 the students will have a good understanding of the designing and making principles that they have explored in theory lessons. Their knowledge and understanding of these key areas will have been further improved as they have applied what they have learnt to their own coursework project.
	<b>Term 2:</b>	<b>Designing and making principles...</b> -Design methods and processes continued	<b>Exploring theory topics (continued) ...</b> -Accuracy in design and manufacture -Responsible design -Design for manufacture and project management -National and international standards in product design.	<b>Making historical links...</b> There are opportunities throughout the theory to make links back to the past as students consider the origins of materials, processes, their applications and how they have evolved.  <b>Making links with current affairs...</b> The introduction of new topics and concepts are often supported by making links with current affairs and topical debate. Students are encouraged to consider the impact our use of resources, technology and manufacturing has on the world around us.	
	<b>Term 3:</b>	<b>Technical principles...</b> -Materials and their applications	<b>Exploring theory topics (continued) ...</b> -Performance characteristics of materials -Enhancement of materials -Forming, redistribution and addition processes -The use of finishes -Modern and industrial scales of practice	<b>Making links with industry and the engineering sector...</b> Real life case studies are frequently used in lessons to make links back to the real world, giving the students a better understanding of where the areas they have explored in lessons are applied in industry.	

## YEAR 13 A LEVEL DT-PRODUCT DESIGN: CURRICULUM INTENT 2020 2021

	Project	Topics	Knowledge and skills	Cultural capital	Rationale
<b>Year 13</b>	Term 1:	<b>Technical principles...</b> -The requirements for product design and development  <b>Final coursework assessment</b>	<b>Exploring theory topics...</b> -Digital design and manufacture -The requirements for product design and development -Health and safety -Protecting designs and intellectual property	<b>Practical application of knowledge and skills...</b> The students have the opportunity to work independently to apply what they have learnt in real life situations as they work through the design process to solve problems.	<b>A change in focus in year 13...</b> During year 13 the focus of lessons changes, with the emphasis moving away from the coursework project towards exam practice.  <b>Covering the remaining areas of theory...</b> During the first term we explore the remaining areas of theory and ensure that all areas of the specification have been covered.  <b>Completion of the independent coursework project...</b> During the first term the students focus on completing their coursework projects in preparation for the final assessment at the start of the second term.  <b>Preparation for the final exams...</b> The students pull together the knowledge and skills they have acquired during year 12 and the first and second terms of this year in the lead up to the final exams in June.
	Term 2:	<b>Technical principles...</b> -Designing for manufacturing	<b>Exploring theory topics (continued) ...</b> -Designing for manufacturing, maintenance, repair and disposal -Feasibility studies -Enterprise and marketing in the development of products -Design communication	<b>Making historical links...</b> There are opportunities throughout the theory to make links back to the past as students consider the origins of materials, processes, their applications and how they have evolved.	
	Term 3:	<b>Final written exams...</b>		<b>Making links with current affairs...</b> The introduction of new topics and concepts are often supported by making links with current affairs and topical debate. Students are encouraged to consider the impact our use of resources, technology and manufacturing has on the world around us.	