



## CHS South Curriculum Intent

**SUCCESSFUL:** An education where imagination, curiosity and resilience enable us to ignite our learning.

**CREATIVE:** A shared belief that optimism, empathy and responsibility are the foundations for a respectful, safe and inclusive community.

**HAPPY:** Individuals who are ready to learn, practise being reflective, and are motivated to become champions.

## CHS Curriculum Area Framework for Learning – Year 10

<b>SUBJECT</b>	<b>Design Technology</b>
<b>INTENT</b>	<p>Design and Technology exposes students to a wide range of areas relating to not only how products are designed and made, but also gives an insight into the justification for using and avoiding materials, considerations for sustainability and explore how historical developments have led to advances in manufacturing processes, as a result, GCSE Design and Technology will prepare students to participate confidently and successfully in an increasingly technological world.</p> <p>Students will gain awareness and learn from wider influences on Design and Technology including historical, social, cultural, environmental, and economic factors, as well as be able to practise and develop some practical skills not only in designing but when working with a range of materials. It is our intention this develops student’s creativity as well as problem solving skills when designing and making and apply technical and practical expertise.</p>

**Department:** **Computing and Technology 2020-2021**

**Subject:** **AQA Design Technology (8552)**

<b>Year Group</b>	<b>10</b>
<b>Rationale/ Narrative</b>	<p>Following on from the foundation year in the subject, students will this year develop greater independence and understanding of the basic:</p> <ul style="list-style-type: none"> <li>• Core Technical principles</li> <li>• Specialist Technical principles</li> <li>• Designing and making principle</li> </ul>



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	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<b>KNOWLEDGE</b>	<p>Students will learn about:</p> <p><b>Metals-</b> topic missed due to COVID lockdown distance learning. Home learning will be also set to consolidate and support retrieval practice from the whole of year 9 NB: To support the assessment after school brain boost groups will be offered. *****</p> <p style="text-align: center;"><b>Year 10 Study PG Online- UNIT 1 New and Emerging Technologies (3.1.1 Core Technical Knowledge)</b></p> <p><b><u>The impact of new and emerging technologies.</u></b></p> <ul style="list-style-type: none"> <li>• Understand the impact of new and emerging technologies on: The design and organisation of the workplace Tools and equipment</li> <li>• Be aware of how computers and automation have changed manufacturing through the use of robotics</li> <li>• Understand how innovation can drive product development and enterprise including the use of crowd funding and virtual marketing</li> <li>• Understand co-operative and fair-trade organisation</li> </ul>	<p>Students' will complete a series of focused practical tasks – 3.3 <b>Designing and Making Principals</b></p> <p>This is a COVID recovery plan to ensure students are upskilled in key Health &amp; Safety knowledge and, also key practical skills that they have been missed due to COVID restrictions where no practical's took place during the last 18 months. This is an essential unit of work to support student's ability to be informed designers for NEA.</p> <ul style="list-style-type: none"> <li>• <b><u>Health and Safety</u></b>- Key knowledge of how the workshop operates.</li> <li>• <b><u>PPE</u></b>- what is it and why do we wear it?</li> </ul> <p><b><u>Specific areas of 3.3 being covered:</u></b></p> <ul style="list-style-type: none"> <li>• Cutting and shaping materials with <b>hand tools</b>.</li> <li>• Prototype development.</li> <li>• Material management</li> </ul>	<p>Students will focus their learning on PG Online-UNIT 2 energy, materials, systems and devices. <b>(3.1.1 Core Technical Knowledge)</b></p> <p><u>They will learn:</u></p> <p><b><u>3.1.2 Energy Generation</u></b></p> <ul style="list-style-type: none"> <li>• Understand how power is generated from fossil and nuclear fuels</li> <li>• Understand how power is generated from renewable energy sources such as: wind, solar, tidal, hydroelectric and biomass</li> <li>• Be aware of the arguments for and against the selection of fossil fuels, renewable energy and nuclear power</li> </ul> <p><b><u>3.1.2 Energy Storage</u></b></p> <ul style="list-style-type: none"> <li>• Be able to identify mechanical power and understand how it is stored</li> <li>• Understand pneumatics and hydraulics as examples of kinetic pumped storage systems</li> <li>• Understand the functional properties of alkaline and re-chargeable batteries</li> </ul> <p><b><u>3.1.3 Modern Materials</u></b></p> <ul style="list-style-type: none"> <li>• Be able to recognise a range of modern materials</li> <li>• Describe developments made through the invention of new or improved processes involving modern materials</li> <li>• Explain how modern materials can be used to alter functionality</li> </ul> <p><b><u>3.1.3 Smart Materials</u></b></p> <ul style="list-style-type: none"> <li>• Be able to recognise a range of smart materials</li> </ul>	<p>Students will focus their learning on PG Online-UNIT 4 – 3.2 Specialist Technical Principals</p> <p><u>They will learn:</u></p> <p><b><u>3.2.2 Forces and Stresses</u></b></p> <ul style="list-style-type: none"> <li>• Be able to recognise and characterise tension, compression, bending, torsion and shear forces and stresses</li> <li>• Understand the impact of different forces and stresses on materials</li> </ul> <p><b><u>3.2.2 Improving Functionality</u></b></p> <ul style="list-style-type: none"> <li>• Understand how materials may be enhanced to resist and work with forces and stresses to improve functionality</li> </ul> <p><b><u>3.2.3 Ecological and social footprint</u></b></p> <ul style="list-style-type: none"> <li>• Understand that greenhouse gases and carbon are produced during the manufacture of products</li> <li>• Understand the impact that a consumer society has on natural resources and the environment including deforestation, mining, drilling, farming and product miles</li> <li>• Be aware of the need for social and governmental responsibility to address safe working conditions and pollution</li> </ul> <p><b><u>3.2.3 Ecological and social footprint</u></b></p> <ul style="list-style-type: none"> <li>• Be aware of the role that consumers play in reducing waste and the demand on finite resources</li> </ul>	<p>Students' will complete a project-based task that will involve the acquisition of knowledge that centres around: <b>Practice NEA.</b></p> <ul style="list-style-type: none"> <li>• Analyse the context-based around the work of others.</li> <li>• Task analysis, client profiles.</li> <li>• Define a client's need.</li> <li>• Develop a design brief.</li> <li>• Research context specific content.</li> <li>• Specification</li> <li>• Designing and developing prototypes in response to client wants and needs.</li> <li>• Selecting and using a variety of materials and components.</li> <li>• Plan of making</li> <li>• Material management.</li> <li>• Selecting and using specialist tools and equipment.</li> <li>• Identification of Specialist techniques and processes suitable for a specifically named material.</li> </ul>	<p>Students will be introduced to the Board prescribed NEA topics. They will focus their learning on the completion of the initial required sections. In relation to these students will:</p> <ul style="list-style-type: none"> <li>• Analyse the contextual challenges set out by the examination board.</li> <li>• Task analysis, client profiles. (A)</li> <li>• Define a client's need. Research context specific content. (A)</li> <li>• Develop a design brief and Specification (B)</li> </ul>



	<p><b><u>Sustainability and the environment</u></b></p> <ul style="list-style-type: none"> <li>• Understand that new technologies need to be developed and produced in a sustainable way</li> <li>• Be aware of the impact that excessive use of certain materials has on the environment</li> <li>• Understand how the environment can be protected by responsible design and manufacturing</li> <li>• Understand how waste can be disposed of with the least impact on the planet</li> <li>• Understand the positive and negative impacts new products have on the environment</li> </ul> <p><b><u>People culture &amp; society</u></b></p> <ul style="list-style-type: none"> <li>• Understand how technology push and market pull affect consumer choice and employment</li> <li>• Understand changes in job roles due to the emergence of new ways of working</li> <li>• Be aware of changes in fashion and trends and how they affect designers and manufacturers</li> <li>• Understand how new products can have both a positive and negative impact on society</li> </ul> <p><b><u>Production techniques</u></b></p> <ul style="list-style-type: none"> <li>• Understand contemporary and potential future use of automation, Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM)</li> <li>• Be able to recognise and characterise the use of Flexible Manufacturing Systems (FMS)</li> <li>• Understand how Just In Time (JIT) and Lean Manufacturing contribute to manufacturing efficiencies</li> </ul> <p><b><u>Informing design decisions</u></b></p> <ul style="list-style-type: none"> <li>• Be able to evaluate the advantages and disadvantages of planned obsolescence from different perspectives</li> </ul>	<ul style="list-style-type: none"> <li>• Use of appropriate marking out methods</li> <li>• Specialist tools &amp; equipment</li> <li>• Specialist techniques and processes.</li> <li>• Surface treatment and finishes.</li> </ul> <p><b><u>3.1 &amp; 3.2- Materials</u></b> knowledge will be drawn upon from both these areas of the syllabus.</p>	<ul style="list-style-type: none"> <li>• Understand how the functional properties of a range of smart materials can be changed by external stimuli</li> </ul> <p><b><u>3.1.3 Composite materials and technical textiles</u></b></p> <ul style="list-style-type: none"> <li>• Understand how material properties can be enhanced by combining two or more materials</li> <li>• Recognise a range of composite materials and technical textiles</li> <li>• Understand how fibres can be manipulated to create technical textiles</li> </ul> <p>• <b><u>Systems approach to designing- Unit 2 lesson 6 PG (3.1.4)</u></b></p> <ul style="list-style-type: none"> <li>• Understand the principles of electronic systems</li> <li>• Use systems diagrams and flowcharts to analyse and solve a given problem</li> <li>• Understand the use of open and closed loop systems and subsystems</li> <li>• Recognise and understand common electronic input and output components</li> </ul> <p>• <b><u>Electronic systems processing- Unit 2 lesson 7 PG (3.1.4)</u></b></p> <ul style="list-style-type: none"> <li>• Understand the difference between analogue and digital signals</li> <li>• Understand how microcontrollers are programmed as counters, timers and for decision making to provide functionality to products and processes</li> <li>• Understand the use of buzzers, speakers and lamps to provide functionality to products and processes</li> </ul> <p><b><u>3.1.5 Mechanical devices</u></b></p> <ul style="list-style-type: none"> <li>• Be able to recognise and identify a range of movements</li> </ul>	<ul style="list-style-type: none"> <li>• Understand the hierarchy of options in responsible and sustainable design</li> </ul> <p><b><u>3.2.7 Scales of Production</u></b></p> <ul style="list-style-type: none"> <li>• Understand how products are produced in different volumes</li> <li>• Explain when and why different manufacturing methods are used for different production volumes</li> <li>• Be able to link the use of relevant specialist processes to the appropriate level of production</li> </ul>		
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	<ul style="list-style-type: none"> <li>• Understand how products can be designed to be repaired and recycled</li> <li>• Be aware of ethical and environmental concerns when designing with new technologies</li> </ul>		<ul style="list-style-type: none"> <li>• Understand the functions of mechanical devices to produce linear, rotary, reciprocating and oscillating movements</li> <li>• Understand how mechanisms can be used to change magnitude and direction of force, including levers, linkages, and rotary systems</li> </ul>			
<b>SKILLS</b>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• Retrieval Practice</li> <li>• Identify, select and breakdown key Information.</li> <li>• Summarise facts.</li> <li>• Investigate, research and question.</li> <li>• Analyse and evaluate.</li> </ul>	<p>Students will be able to develop and, successfully use a variety of practical skills which will include:</p> <ul style="list-style-type: none"> <li>• Measuring</li> <li>• Marking</li> <li>• Prototyping</li> <li>• Selecting and using specialist tools</li> <li>• Selecting and using construction techniques</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• Identify, select and breakdown key Information.</li> <li>• Summarise facts.</li> <li>• Investigate, research and question.</li> <li>• Experiment</li> <li>• Argue</li> <li>• Analyse and evaluate</li> </ul>	<p>Students will develop the skills of:</p> <ul style="list-style-type: none"> <li>• Investigation</li> <li>• Analysis</li> <li>• Evaluation</li> <li>• Drawing by hand and with computer software packages</li> <li>• Modelling</li> <li>• Communication, recording and justifying design ideas</li> </ul>	<p>Students will be able to develop and use successfully a variety of practical skills which will include:</p> <ul style="list-style-type: none"> <li>• Investigate, research and question.</li> <li>• Analyse and evaluate</li> <li>• Drawing</li> <li>• Communication, recording and justifying design ideas</li> <li>• Measuring</li> <li>• Marking</li> <li>• Prototyping</li> <li>• Selecting and using specialist tools and machines</li> <li>• Selecting and using a variety of construction techniques.</li> </ul>	<p>Students will develop skills in:</p> <ul style="list-style-type: none"> <li>• Researching and investigating</li> <li>• Writing a design brief and specification</li> </ul>
<b>ASSESSMENTS</b>	<ul style="list-style-type: none"> <li>• <b>Classwork piece</b> – Baseline year 9 Materials assessment (using unit 3 materials knowledge)</li> <li>• <b>Feedback Workshop</b>- RAG- outcome and plan self-study targets</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Progress Test</b> – The test will be in the format that will be encountered by students at the end of the course in the summer term of Year 11</li> <li>• <b>Feedback Workshop</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Classwork piece</b> – Exam Question on energy generation &amp; storage</li> <li>• <b>Feedback Workshop</b> – RAG- outcome and plan self-study targets</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Progress test</b> – The test will be in the format that will be encountered by students at the end of the course in the summer term of Year 11</li> <li>• <b>Feedback Workshop</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Classwork piece</b> – Production of a Specification</li> <li>• <b>Feedback Workshop</b></li> <li>• <b>Class workpiece</b> – Practical outcome</li> <li>• <b>Feedback Workshop</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Progress Test</b> – The test will be in the format that will be encountered by students at the end of the course in the summer term of Year 11</li> <li>• <b>Feedback Workshop</b></li> </ul>



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	<ul style="list-style-type: none"> <li>• <b>Classwork piece</b> – End of unit assessment of Unit 1</li> <li><b>Feedback Workshop</b> RAG- outcome and plan self-study targets</li> </ul>	<p>RAG- outcome and plan self-study targets</p> <ul style="list-style-type: none"> <li>• <b>Classwork piece</b> – Practical skills assessment</li> <li><b>Feedback Workshop</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Classwork piece</b> – End of Unit 2 assessment</li> <li><b>Feedback Workshop</b> RAG- outcome and plan self-study targets</li> </ul>	<p>RAG- outcome and plan self-study targets</p> <ul style="list-style-type: none"> <li><b>Classwork piece</b> – Exam question based on Ecological and social footprint</li> <li><b>Feedback Workshop</b></li> </ul>		<p>RAG- outcome and plan self-study targets</p> <ul style="list-style-type: none"> <li>• <b>Classwork piece</b> – AO1 Section A: Identifying and investigation design possibilities.</li> </ul> <p>AO1 Section B: Design Brief and Specification (10 Marks)</p>
<b>HOME LEARNING</b>	<p><b>Task 1:</b> Forms quiz materials areas retrieval Practice.</p> <p><b>Task 2:</b> Forms quiz materials areas retrieval Practice.</p> <p><b>Task 3:</b> Home study for baseline test (home study pack provided to students for this).</p>	<p><b>Task 1:</b> Home study revision task in preparation for progress test. (home study pack provided to students for this).</p> <p><b>Task 2: Forms Quiz-</b> Unit 1 Emerging technologies</p> <p><b>Task 3: Sketchbook</b> Research into work of others</p>	<p><b>Task 1:</b> Forms quiz materials areas retrieval Practice</p> <p><b>Task 2: Sketchbook</b> Research into work of others</p> <p>NB: two home learning tasks et as short half term</p>	<p><b>Task 1:</b> Home study revision task in preparation for progress test.</p> <p><b>Task 2: Sketchbook</b> Research into work of others</p> <p>NB: two home learning tasks et as short half term</p>	<p><b>Task 1:</b> Forms quiz materials areas retrieval Practice</p> <p><b>Task 2: Sketchbook</b> Research into work of others</p> <p><b>Task 3: Sketchbook</b> Research into work of others</p>	<p><b>Task 1:</b> Home study revision task in preparation for progress test.</p> <p><b>Task 2:</b> Research into context of the NEA/client profiles</p> <p>NB- no third home study task as year 10 are on work experience</p>
<b>READING, WRITING, TALK</b>	<p>Students will develop skills relating to <b>reading</b> drawings and formal written text. Students will be encouraged to read work in depth and highlight/break down key pieces of information which is considered essential to their understanding. Students will be also required to use skills in inference, paraphrasing, and analysis.</p> <p><b>Writing</b> skills will be developed both within lessons and in the completion of home learning tasks. Throughout their work there will be numerous opportunities for students to develop skills in</p>	<p>Students will develop skills relating to <b>reading</b> drawings and formal written text. Students will be encouraged to read work in depth and highlight/break down key pieces of information which is considered essential to their understanding. Students will be also required to use skills in inference, paraphrasing, and analysis.</p> <p><b>Writing</b> skills will be developed both within lessons and in the completion of home learning tasks. Throughout their work there will be numerous opportunities for students to develop skills in</p>	<p>Students will develop skills relating to <b>reading</b> drawings and formal written text. Students will be encouraged to read work in depth and highlight/break down key pieces of information which is considered essential to their understanding. Students will be also required to use skills in inference, paraphrasing, and analysis.</p> <p><b>Writing</b> skills will be developed both within lessons and in the completion of home learning tasks. Throughout their work there will be numerous opportunities for students to develop skills in</p>	<p>Students will develop skills relating to <b>reading</b> drawings and formal written text. Students will be encouraged to read work in depth and highlight/break down key pieces of information which is considered essential to their understanding. Students will be also required to use skills in inference, paraphrasing, and analysis.</p> <p><b>Writing</b> skills will be developed both within lessons and in the completion of home learning tasks. Throughout their work there will be numerous opportunities for students to develop skills in</p>		<p>Students will develop skills relating to <b>reading</b> drawings and formal written text. Students will be encouraged to read work in depth and highlight/break down key pieces of information which is considered essential to their understanding. Students will be also required to use skills in inference, paraphrasing, and analysis.</p> <p><b>Writing</b> skills will be developed both within lessons and in the completion of home learning tasks. Throughout their work there will be numerous opportunities for students to develop skills in</p>



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	<p><b>writing</b> in various styles ranging from annotation of drawings to extended writing tasks.</p> <p>There will be opportunities for discursive <b>talk</b> in every lesson using talk protocols. Students will be encouraged to freely discuss thoughts, ideas and opinions about topics throughout all lessons. In addition, students will be involved in peer guided talk sessions to aid development of extended writing tasks.</p>	<p><b>writing</b> in various styles ranging from annotation of drawings to extended writing tasks.</p> <p>There will be opportunities for discursive <b>talk</b> in every lesson using talk protocols. Students will be encouraged to freely discuss thoughts, ideas and opinions about topics throughout all lessons. In addition, students will be involved in peer guided talk sessions to aid development of extended writing tasks.</p>	<p><b>writing</b> in various styles ranging from annotation of drawings to extended writing tasks.</p> <p>There will be opportunities for discursive <b>talk</b> in every lesson using talk protocols. Students will be encouraged to freely discuss thoughts, ideas and opinions about topics throughout all lessons. In addition, students will be involved in peer guided talk sessions to aid development of extended writing tasks.</p>			
<p><b>TIER 3 VOCAB</b></p>	<ul style="list-style-type: none"> <li>• Ferrous</li> <li>• Alloy</li> <li>• Automation</li> <li>• Enterprise</li> <li>• Finite</li> <li>• Non-finite</li> <li>• Emergent Technology</li> <li>• Lean manufacturing</li> <li>• Life Cycle Assessment</li> </ul>	<ul style="list-style-type: none"> <li>• Health and Safety</li> <li>• Risk Assessment</li> <li>• Hazzard</li> <li>• PPE</li> <li>• Prototype</li> </ul>	<ul style="list-style-type: none"> <li>• Composite</li> <li>• Technical Textile</li> <li>• Smart Material</li> <li>• Modern Material</li> <li>• Material Property</li> <li>• Systems Approach</li> <li>• Mechanism</li> <li>• Renewable</li> </ul>	<ul style="list-style-type: none"> <li>• Force</li> <li>• Stress</li> <li>• Compression</li> <li>• Tension</li> <li>• Torsion</li> <li>• Shear</li> <li>• Ecological</li> <li>• Scale of Production</li> </ul>	<ul style="list-style-type: none"> <li>• Iterative Design</li> <li>• Design Fixation</li> <li>• Client</li> <li>• Consumer</li> <li>• Specification</li> <li>• Cutting list</li> <li>• Evaluate</li> </ul>	<ul style="list-style-type: none"> <li>• Contextual Challenge</li> <li>• Primary Data</li> <li>• Secondary Data</li> </ul>
<p><b>PSPSMC, BRITISH VALUES</b></p>	<p><b>Personal:</b> During the first term of Year 10 students will be establishing routines for work and expectations in the classrooms and workshops environment. Technology subjects will make effective use of employability skills throughout the methods of learning and application of learning in lessons, such as creative thinking, effective participation, group work, independent work and confidence with unknown topics and activities.</p> <p><b>Social:</b> During the topics covered social links will be made through looking at the social impact of designs and working with materials and products. This can be specifically linked to the specification being studied to see the impact products and materials have on people and places.</p>	<p><b>Physical:</b> Student’s physical wellbeing will be utilised using practical activities and engagement with practical tasks and topics. Students are required to participate in these activities through independent work or with the work of peers in the classroom.</p> <p><b>Moral:</b> Moral issues are taught using the D&amp;T specification, and the moral implications of designs and materials. Students will be taught the moral implications of working with tools and equipment and materials, and the choices consumers and manufacturers must make when they select materials for their working properties in conjunction with their environmental impact.</p>	<p><b>Cultural:</b> using teaching and learning activities and enrichment activities students will have access to cultural awareness in relation to the design of products, the promotion of products and the manufacture of products. These links will be made as and when relevant to a topic being covered.</p> <p><b>British Values:</b> Students will be able to explore the use of British standards and political correctness when designing and making products and the impact these designs have on society.</p>			



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