



FRAMEWORK FOR LEARNING

CREATIVE

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

HAPPY

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

SUCCESSFUL

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

SUBJECT

TECHNOLOGY – RESISTANT MATERIALS

TECHNOLOGY – TEXTILES

INTENT

"Design is everywhere. From the dress you're wearing to the smartphone you're holding. It's design" - Samadara Ginige

Design and technology aims to ensure that all students:

- Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world.
- Students will build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users, critique, evaluate and test their ideas and products and the work of others.

Design and technology aims to ensure that all students:

- Develop core skills and a strong technical understanding which aids their personal development and provides them opportunity to achieve whilst gaining life-long learning experiences.
- Students will acquire knowledge that gives them a strong understanding of the world around them and our heritage as a design and manufacturing nation. Students will not only obtain knowledge, but also develop understanding whilst practicing home skills that make them able to contribute and add value to our community at a local, national and global level.



YEAR GROUP

YEAR 10

RATIONAL / NARRATIVE

Following on from the foundation year in the subject, students will this year develop greater independence and understanding of:

- Core Technical principles
- Specialist Technical principles
- Designing and making principle

Students will complete this year looking at areas of Design and Technology that underpin their understanding of the wider world of Design and Technology beyond just material areas, focussing on looking at the impact of Technology over time, from the industrial revolution through to the use of sophisticated CAM manufacture and automation systems. Students will look at STEM focussed areas and how this has an impact on the products we design and make, as well as exploring the work of other key designers in the fields of architecture, fashion, graphics, systems, product design etc.

Towards the end of Year 10 students will develop their own independent projects based upon exam board set contexts as the NEA begins in Summer 2.

TERM KNOWLEDGE

AUTUMN 1

Students will learn about new and emerging technologies:

The impact of new and emerging technologies
Smart and modern materials.
Enterprise based on the development of an effective business innovation. Blue sky thinking.
How technology push/market pull affects choice.
How products are designed and made to have both positive and negative impact on others and the environment.
The contemporary and potential future use manufacturing systems.

AUTUMN 2

Students will learn about Energy, Materials, systems and devices:

How power is generated from fossil fuel.
The impact of resource consumption on the planet
Arguments for and against the selection of fossil fuels.
How nuclear power is generated.
Arguments for and against the selection of nuclear power.
How power is generated from sustainable sources.
Arguments for and against the selection of renewable energy.
Kinetic pumped storage systems.

SPRING 1

Students will learn about common technical principles:

Forces and stresses on objects and materials
Structures
STEM (Physical properties of materials)
Improving functionality
Ecological and social footprints
Safe working conditions
Pollution and product miles
The six R's
Scales of production

SPRING 2

Students will learn about Designing principles

Compare the work of past and present designers and companies to inform their own designing.
Learn how to use a range of different design strategies.
Develop, communicate, record and justify design ideas using a range of appropriate techniques
Respecting people of different faiths and beliefs.

SUMMER 1

Students will learn about Making principles

Designing and developing prototypes in response to client wants and needs.
Selecting and using a variety of materials and components.
Material management.
Selecting and using specialist tools and equipment.
Identification of Specialist techniques and processes suitable for a specifically named material.

SUMMER 2

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:

Analyse the contextual challenges set out by the examination board.
Develop a design brief.



<p>SKILLS</p>		Alkaline and re-chargeable batteries. Forces and stresses				
	Students will be able to: Identify, select and breakdown key information. summarize facts. Investigate, research and question. Analyze and evaluate CAD and rapid prototyping	Students will be able to: Identify, select and Breakdown key Information. summarize facts. Investigate, research and question. Argue Analyze and evaluate	Students will be able to develop and use successfully a variety of practical skills which will include: Drawing Measuring Marking Selecting and using Specialist tools and machines Selecting and using a variety of construction techniques.	Students will develop the skills of: Investigation Analysis Evaluation Drawing by hand and with computer software packages Modelling Communication, recording and justifying design ideas	Students will be able to develop and use successfully a variety of practical skills which will include: Drawing Measuring Marking Selecting and using Specialist tools and machines Selecting and using a variety of construction techniques.	Students will develop skills in: Researching and investigating (Section A) Writing a design brief (Section B) Generating ideas (Section C)
	<p>ASSESSMENT</p>	<p>Key Assessment Piece: Classwork piece – Exam Question on New and emerging technologies</p> <p>Key Assessment Piece: End Point assessment. At the end of this unit of work a topic ‘test’ will assess their key understanding through the scheme and measure their progress in this subject.</p>	<p>Key Assessment Piece: Classwork piece – Students will be required to carry out some research on renewable energy Pros and cons</p> <p>Key Assessment Piece: Home learning: Case study exploration and exam question</p>	<p>D&T Progress Test Students will have a progress checkpoint assessment to assess their knowledge and understanding of the topics covered in this unit.</p> <p>Key Assessment Piece: End Point assessment. At the end of this unit of work a topic ‘test’ will assess their key understanding through the scheme and measure their progress in this subject</p>	<p>Key Assessment Piece: Classwork piece - Product analysis and modification design</p> <p>Key Assessment Piece: Classwork piece on Ergonomics Considerations</p>	<p>Key Assessment Piece: Classwork piece – Production of a manufacturing plan.</p> <p>Key Assessment Piece: End Point assessment. At the end of this unit of work a topic ‘test’ will assess their key understanding through the scheme and measure their progress in this subject</p>
<p>HOME LEARNING</p>	<p>Home Learning: 1 per fortnight</p> <p>Task 1: To complete sheet on new and emerging technology.</p>	<p>Home Learning: 1 per fortnight</p> <p>Task 1: To create a model of a renewable energy system</p>	<p>Home Learning: 1 per fortnight</p> <p>Task 1: Students to analyse a product at home in relation to</p>	<p>Home Learning: 1 per fortnight</p> <p>Task 1: Students will complete several client profiles to be used as part of classwork project.</p>	<p>Home Learning: 1 per fortnight</p> <p>Task 1: Testing evaluations for their products.</p>	<p>Home Learning: 1 per fortnight</p> <p>Task 1: Students to produce research amp on contexts given</p>



READING, WRITING, TALK, NUMERACY

<p>Task 2: Students to research current design technology developments and their current uses.</p>	<p>Task 2: Case study exploration and exam question</p>	<p>ecological and social impact</p> <p>Task 2: Students to use the 6 Rs to improve an everyday item (Bin, phone, Bag etc.)</p>	<p>Task 2: Student presentation on designers</p>	<p>Task 2: Students will complete the manufacturing plan for their final product.</p>	<p>Task 2: Students to undertake a primary research ask relating to the contexts given</p>
<p>Students will develop skills relating to reading drawings and formal written text. Students will be encouraged to read work in depth and highlight/break down key pieces of information based on the impact of new and emerging technologies, smart and modern materials.</p> <p>Writing During this half term students will focus on deepening their skills of summarizing and evaluating the impact of emerging technologies and the advantages and disadvantages of modern, smart materials.</p> <p>There will be opportunities for discursive talk in every lesson using talk protocols. Students will be encouraged to freely discuss thoughts, ideas and opinions about the impact of modern technologies and the advantages and</p>	<p>Students will develop skills relating to reading 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>Writing Students will develop their exposit writing skills. They will summarise key information and present relevant information for and against fossil fuels and nuclear power and energy storage systems.</p> <p>Students will be encouraged to talk freely, discuss thoughts, ideas and opinions about the impact fossil fuels are having on the planet and give explain the pros and cons.</p> <p>Numeracy:</p>	<p>Students will be reading a range of texts linked to this topic. They will focus on deepening their skills of breaking down information and learning new vocabulary.</p> <p>Writing skills will be developed on answering high level responses to GCSE questions in preparation to progress test.</p> <p>Students will be encouraged to talk their answers through and feedback to the class.</p> <p>Numeracy: Pupils will identify and work out product miles and the impact they have on climate change.</p>	<p>Students will be expected to read a variety of resources including: their online research, printed resources based on the work of others.</p> <p>Writing skills will be developed both within lessons and in the completion of home learning based on the work of others. They will be expected to analyse the work of others identifying where they get their inspiration from, products they make and their own views and opinions on the designers they have studied. Students will need to annotate the models of their own work and identify what has worked well and areas need to improve on.</p> <p>They will present the research they have carried out to the class and talk through their findings and views and opinions on the work of others. They will need to talk through how they have</p>	<p>Students will develop skills relating to reading health and safety rules of equipment they will be expected to use to make their chosen products. Students will need to read through their specification ensuring that all their clients needs and wants are met.</p> <p>Writing . Students will be expected to write a specification and annotate their final product.</p> <p>There will be opportunities for discursive talk though the breakdown of how to use the appropriate equipment in the workshop.</p> <p>Numeracy: Students will learn about areas of compound shapes and calculating waste.</p>	<p>Students will be expected to read through their exercise books and retrieve prior knowledge to help aid them in their end of year progress test. They will also be expected to read their new contextual challenge set by AQA for their NEA.</p> <p>Writing skills will be developed through the break down of the contextual challenge and responses to their written progress test.</p> <p>There will be opportunities for discursive talk based on the new NEA contextual challenge.</p> <p>Numeracy: Students will research fractions and percentages based on their new NEA.</p>



TIER 2 VOCABULARY

TIER 3 VOCABULARY

PSPSMC, BRITISH VALUES AND DIVERSITY

<p>disadvantages of modern and smart materials.</p> <p>Numeracy: Students will identify profits and costs of the automotive systems.</p>	<p>Students will learn how energy is created and percentages. Gears & pulley ratios.</p>		<p>considered ergonomics in their models. Opportunity for students to talk about the importance of respecting people of different faiths and beliefs when considering design ideas.</p> <p>Numeracy: Areas of shapes, working out weight ratios.</p>		
<ul style="list-style-type: none"> • Environment • Advantages • Disadvantages • Robotic • Pollution • Global warming • Flexible • Efficient • Cultural 	<ul style="list-style-type: none"> • Society • Design • Manufacture • Generation • Process 	<ul style="list-style-type: none"> • Benefit • Calculate • Apply • Choose • Identify • Income • Justify 	<ul style="list-style-type: none"> • Waist • Length • Function • Environment • Social • Aesthetics • Assemble 	<ul style="list-style-type: none"> • Depth • Develop • Investigating • Source • Specific • Role 	<ul style="list-style-type: none"> • Retail • Discrete • Continuous • Income • Factor
<ul style="list-style-type: none"> • Enterprise • Crowd funding • Ethics • Retail • Commercial process • Contemporary • Market pull • Emergent technology • Fair trade • Automation 	<ul style="list-style-type: none"> • Kinetic • Biomass • Conservation • Geothermal • Hydroelectric • Turbine • Carbon footprint • Nuclear • Alkaline 	<ul style="list-style-type: none"> • Client • Prototype • Cutting list • Lean manufacturing • Functionality • Aesthetics 	<ul style="list-style-type: none"> • Flow diagram • Feedback loops • Quality control • Anthropometrics • Ergonomics 	<ul style="list-style-type: none"> • Tolerance • Nesting • Tessellation • Datum • Templates • Jigs • Patterns • Wasting & Abrading 	<ul style="list-style-type: none"> • Iterative design • Collaboration • Primary research • Secondary research
<p>Personal: 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>Social: 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>Physical: Student's physical wellbeing will be utilized 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>Moral: Moral issues are taught using the D&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>Cultural: 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>					



British Values: 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.

Diversity: Students are expected to research 'The Work of Others' – giving students the opportunity to address gender bias according to traditional representation in areas of the subject. This will help shape, change and push forward a more inclusive look at design.