



# Department: Design Technology

## Curriculum Intent Statement

### Our Curriculum Vision & Purpose

Our vision is to encourage pupils to confidently design and make products that are both functional and visually appealing. We want all pupils to think like designers, identify and solve problems for different groups users through creative design and high quality manufacturing, whilst building confidence and independence by using equipment safely, and encouraging problem solving. We also want pupils to reflect critically on their daily lives and the products that they use and consider how manufacturing affects the environment, and how to design responsibly for a sustainable future. Finally we want to inform pupils about the commercial processes used to manufacture and package products and the careers in related industries.

### Powerful Knowledge

Pupils will recognise strong links to science when exploring the physical properties of materials. This will include the use of new and smart materials. Pupils will consider how new and emerging technologies have changed the way we live, work and manufacture products. There are also clear links to Geography as pupils explore how energy is generated and used in electronic products. Pupils will understand the design process and how to investigate, design, make and evaluate as part of the iterative design process.

### Curriculum Features

The GCSE content is spread over 5 years and topics are revisited throughout. Pupils develop a wide range of practical skills to construct products using permanent and non-permanent joining techniques and applying finishes. As pupils become more knowledgeable, they are able to select and use tools and materials to create more unique and challenging outcomes. There are clear opportunities to apply their knowledge of maths and science throughout KS3 and KS4. At GCSE level pupils are challenged to design and make a product based on the own research, designing and evaluation. The theory topics required for the GCSE exam are taught through a variety of practical projects including the use of electronics and modern materials.



# Continuous Development Cycle

Curriculum Knowledge & Assessment Overview 2019-20

Department: Design Technology

**Please note:** In Year 7, Year 8 & Year 9 all pupils will study Design Technology over a 13-week period, as part of a carousel arrangement with other subjects. The 13-week session could be either at the start, in the middle or near the end of the academic year.

	Term / Duration	Topic & Main Content Overview	Assessment Task/Focus & Objectives	Powerful Knowledge for Year 7 (referenced to topic as appropriate)
<b>Year 7 Scheme Overview</b>	Term 1 Rotation 1 7 Weeks Max. No. Lessons: 14	<p>Students will understand the advantages and disadvantages of using computers to design and manufacture products.</p> <p><b>Students will consider how mechanisms can cause different types of motion when creating a pop up book.</b></p> <p>Students will be able to name different manufactured boards, describe their properties and uses.</p> <p>Students to consider how use of timber leads deforestation &amp; environmental issues, e.g. climate change.</p> <p>Students will be able to name different polymers, describe their properties and uses.</p> <p>Students will consider the environmental impact of using polymers in products.</p> <p>Students will be able to identify different forces and stresses &amp; how products are designed to withstand them.</p> <p><b>Students will investigate, design, make and evaluate a photoframe using machines and hand tools.</b></p> <p>Student will consider how commercial manufacturing techniques could be used to mass-produce their product.</p>	<p>Mid rotation exam paper including multiple choice questions, maths based questions, short and long answer questions.</p> <p>Create a series of designs ideas including annotation, weighted lines, rendering and different views.</p> <p>Create a product using manufactured boards that demonstrates your ability to use tools safely and accurately.</p>	<p>Students will understand how to plan a project, present design ideas and use tools safely.</p> <p>Students will understand why different materials are used to manufacture the products that we use everyday.</p> <p>Students will consider the environment impact of making timber and polymer products. They will reflect on the way they use and dispose of products.</p> <p>Students will consider how products are designed and made for mass products. They will consider how this has affect job roles and develop some of the skills required to work in the modern day manufacturing industry.</p>

Powerful Knowledge includes key 'invaluable' and distinct knowledge concepts linked to this subject; it is distinct from common sense.

Assessment Format to follow whole-school expectations (MCQs for Content Knowledge & Understanding, GCSE-style Qs. for Application of Skills).



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	<p>Term 2 Rotation 1 6 Weeks Max. No. Lessons: 12</p>	<p>Student will learn how to calculate areas and percentages. <b>Students will use Google Sketchup to create a platform game called Jungle Strike.</b> Students will explore the work of designers Ettore Sottsass and Gerrit Rietveld. <b>Students will explore a range of 3d drawing techniques such as isometric and oblique to redesign furniture in the style of Ettore Sottsass.</b> We will explore how products such a mobile phones have evolved over time due to technology push and market pull.</p>	<p>End of rotation exam paper including Multiple choice questions, maths based questions, short and long answer questions. Several topics covered in the mid term assessment will be repeated in the mid term assessment.</p>	<p>Students will use areas to calculate the cost of materials. Students will develop an awareness and appreciation of design. This will enable them to produce more innovative and original contemporary designs.</p>
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<b>Year 8 Scheme Overview</b>	Term 1 7 Weeks Max. No. Lessons: 14	<p><b>Students will investigate, design, make and evaluate a pinball machine using traditional wood joints and levers.</b></p> <p>Students will consider the advantages and disadvantages of renewable and non-renewable energy generation.</p> <p>Students will consider how materials are combined to create composite materials such as glass fibre reinforced plastic.</p> <p>Students will be able to identify different technical textiles such as Nomex and Kevlar and describe their properties and uses.</p> <p>Student will be able to name and describe different types of natural timbers such as beech and spruce.</p> <p>Students will understand how surface treatments and finishes are used for aesthetic and functional reasons.</p> <p>Student will develop a greater awareness of influential designers such as Harry Beck.</p> <p>Students will learn how to create an isometric drawing.</p> <p>Students will learn about materials management and calculating cost.</p>	<p>Mid rotation exam paper including Multiple choice questions, maths based questions, short and long answer questions.</p> <p>Create a designs idea using the isometric drawing technique including annotation, weighted lines and rendering.</p> <p>Create a product using traditional wood joints that demonstrates your ability to use tools safely and accurately.</p>	<p>Students will understand how to plan a project, present design ideas and use tools safely. Students will understand how wood joints are used to provide structural strength to products.</p> <p>Students will develop a greater understand why different materials are used to manufacture the products that we use everyday.</p> <p>They will consider how new scientific research has led to the development of new materials with unique properties.</p> <p>They will create designs for a variety of briefs and clients in different contexts.</p> <p>They will develop the skills and understanding required to work in graphic design, architectural design and manufacturing industries.</p>
	Term 2 6 Weeks Max. No. Lessons: 12	<p><b>Students will use Google Sketchup to create a 3d Shop front for a real coffee shop called 'Twig.'</b></p> <p><b>Students will use 2D design software to create a chocolate bar wrapper and cast a chocolate bar wrapper in moulds.</b></p> <p>Students will be able to describe different scales of</p>	<p>End of rotation exam paper including Multiple choice questions, maths based questions, short and long answer questions.</p>	

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	<p>production and understand how production aids such as jigs and moulds are used to aid production.</p> <p>Students will be able to identify different types of paper and board and describe their properties and uses.</p> <p><b>Students will design a water bottle for the PE department to learn about polymers and polymer based manufacturing techniques.</b></p>		
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	Term / Duration	Topic & Main Content Overview	Assessment Task/Focus & Objectives	Powerful Knowledge for Year 9 (referenced to topic as appropriate)
Year 9 Scheme Overview	Term 1 7 Weeks Max. No. Lessons: 14	<p>Students will consider the environmental impact of manufacturing and how designers are working towards more a sustainable future. Students will be able to describe the Six R's of sustainable design.</p> <p><b>The students will produce a jewellery box to be sold in the Eden Project's gift shop.</b> They will explore permanent and non-permanent joining techniques and will be able to calculate volumes. They will develop their awareness of surface treatments and finishes.</p> <p>Students will be able to identify and describe different modern materials such as graphene.</p> <p>Students will be able to describe the properties and uses of smart materials such as thermo chromic pigments.</p> <p>Students will create a coaster and consider how processes such as lamination can enhance materials.</p> <p>Students will focus on the importance of quality control when manufacturing.</p>	<p>Mid rotation exam paper including Multiple choice questions, maths based questions, short and long answer questions.</p> <p>Create a presentation about sustainable design and designers.</p> <p>Create a timber product using permanent and non-permanent joining techniques that demonstrates your ability to use tools safely and accurately.</p>	<p>Students will appreciate the environmental impact of manufacturing, using and disposing of products. They consider how designers have to had adapt to create products in a more sustainable way.</p> <p>Students will look at how the development of non-permanent joining techniques led to the flat pack revolution.</p> <p>Students will develop a greater awareness of importance of quality control when manufacturing.</p> <p>Students will develop a greater understand why different materials are used to manufacture the products that we use everyday. This will encourage them to important ongoing role that science plays in the development of modern and smart materials.</p>
	Term 2 6 Weeks Max. No. Lessons: 12	<p>Students will be able to interpret and present data using bar charts.</p> <p><b>Students will explore user centred design and create a toy aimed at young children.</b></p> <p>Student will develop more advanced drawings on <b>Google Sketch-up and create a luxury modern building and a children's toy.</b></p>	<p>End of rotation exam paper including Multiple choice questions, maths based questions, short and long answer questions.</p>	<p>Students develop will their ability to user computer aided design software in order to gain the skills required to work the modern design industry.</p>

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		Students will be able to name, describe and categorise different metals and alloys. <b>Students will use 2d design to create a mould for pewter casting.</b>		
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	Term / Duration	Topic & Main Content Overview	Assessment Task/Focus & Objectives	Powerful Knowledge for Year 10 (referenced to topic as appropriate)
Year 10 Scheme Overview	Term 1 7 Weeks Max. No. Lessons: 21	<p><b>Students will investigate, design, make and evaluate a mini table football table using different materials and processes.</b></p> <p>We will look at how materials such as timbers, metals, polymers, paper and textiles are categorised into different groups. Will we consider how their working properties make them suitable for different products.</p> <p>We will look at how scientific research has led to the development of technical textiles, composite materials, modern materials and smart materials.</p>	<p><b>Materials and their working properties Assessment 1</b>, testing recall of all key words and terms.</p> <p><b>Developments in new materials Assessment 2</b>, testing recall of all key words and terms.</p>	<p>Pupils will develop a greater appreciation of materials and their unique properties and uses. They will have an increased awareness of the links between science and technology.</p>
	Term 2 8 Weeks Max. No. Lessons: 24	<p>Students will know and understand the impact of new and emerging technologies.</p> <p>We will consider how products are made, marketed and transported using new and emerging technologies. Students will consider the implications this has for future jobs roles and the environment.</p> <p>Students will explore how mechanical devices such as levers, linkages, cams and gears can be used to create different types of movement in products.</p>	<p><b>New and emerging technologies Assessment 3</b>, testing recall of all key words and terms.</p> <p><b>Mechanical devices Assessment 4</b>, testing recall of all key words and terms.</p>	<p>They will consider how new and emerging technologies have altered the way we live in modern society.</p> <p>They understand how different products work using mechanical devices.</p>
	Term 3 6 Weeks Max. No. Lessons: 18	<p><b>Students will make a modern lamp inspired by Ettore Sottsass.</b> They will laminate flexiply in a jig, use the hotwire strip heater, drill, scroll saw and vacuum former. They will demonstrate their ability to use templates, formers and jigs as production aids.</p> <p>Students will look at timber as the specialist material in more depth.</p> <p>Students will look at how materials or components are selected.</p>	<p><b>Specialist technical making principles Selection of materials or components.</b></p> <p><b>Forces, stresses and enhancing materials.</b></p> <p><b>Scales of production Assessment 5</b>, testing recall of all key words and terms.</p>	<p>Students will learn to take inspiration from others when designing more creative and innovative products. They will consider how consumer demand and globalisation has changed the way we design and manufacture products.</p>

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		<p>They will consider how different forces, stresses affect materials and how materials can be enhanced to with stand forces.</p> <p>Students will look at how different scales of production, such as mass production, are used in modern day manufacturing. Students will also consider how manufacturing produces on a large scale for a growing population has affected the environment.</p> <p>Students will understand how and why surface treatments and finishes, such as varnish, are applied to timber products. Students will compare the work of designers Ettore Sottsass and Gerrit Reitveld. They will also compare two design companies, such as Apple and Under Armour, and use their findings to design products.</p>	<p><b>Specialist technical making principles</b>  <b>Surface treatments and finishes</b>  <b>The work of designers and design companies.</b>  <b>Environmental and social footprint.</b>  <b>Assessment 6</b>, testing recall of all key words and terms.</p>	
	<p>Term 4            7 Weeks            Max. No. Lessons: 21</p>	<p><b>Student will design and make an MP3 speaker using flexi ply, standard components such veneer pins and soldering irons.</b></p> <p>We will look at how is energy generated and stored using renewable and non-renewable sources. We will look at how electronic inputs and outputs are used to control electronic products.</p>	<p><b>Energy generation and storage</b>  <b>Systems approach to designing</b>  <b>Assessment 7</b>, testing recall of all key words and terms.  <b>Sources and origins</b>  <b>Communication of design ideas.</b>  <b>Prototype development</b>  <b>Assessment 8</b>, testing recall of all key words and terms.</p>	<p>Student use electronics to create functional products. They will understand the environmental impact of using electronics and how this concern has led to design innovation.</p>

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	<p>Term 5 4 Weeks Max. No. Lessons: 12</p>	<p><b>Student will design and make a coffee table using a wide range of tools and machinery.</b> Orthographic drawing Materials management. Specialist making techniques. Tolerances.</p>	<p><b>Materials management. Tolerances. Specialist making techniques. Assessment 9, testing recall of all key words and terms.</b></p>	<p>Students will be able to present their design ideas more clearly and use templates and other manufacturing aids to create high quality outcomes.</p>
	<p>Term 6 7 Weeks Max. No. Lessons: 21</p>	<p>Mock exam Introduce the NEA titles. NEA investigation Section A NEA Brief and specification Section B</p>	<p><b>Mock Exam end of year assessment NEA investigation Section A NEA Brief and specification Section B</b></p>	

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	<b>Term / Duration</b>	<b>Topic &amp; Main Content Overview</b>	<b>Assessment Task/Focus &amp; Objectives</b>	<b>Powerful Knowledge for Year 11</b> (referenced to topic as appropriate)
<b>Year 11 Scheme Overview</b>	Term 1 7 Weeks Max. No. Lessons: 14	NEA Generating design ideas Section C NEA Developing design ideas Section D	<b>NEA Generating design ideas Section C</b> <b>NEA Developing design ideas Section D</b>	
	Term 2 8 Weeks Max. No. Lessons: 16	NEA Realising design intentions Section E	<b>NEA Realising design intentions Section E</b>	
	Term 3 6 Weeks Max. No. Lessons: 12	NEA Analysing and evaluating Section F	<b>NEA Analysing and evaluating Section F</b>	
	Term 4 7 Weeks Max. No. Lessons: 14	Revision prior to exams.	Past Papers. Quizzes Multiple choice	
	Term 5 4 Weeks Max. No. Lessons: 8	<b>GCSE Exams</b>		
	Term 6 7 Weeks Max. No. Lessons: 14	<b>GCSE Exams</b>		

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