

# Curriculum Overview – Design Technology



## Introduction

This document outlines **the curriculum and key considerations** including:

- Aims and purpose
- Alignment with the whole school provision and curriculum intent
- A summary programme of study which includes sequencing of taught content

**We use the National Curriculum as our statutory foundation** and broadly share its principles and aims including:

- ‘To provide students with an introduction to the essential knowledge that they need to be educated citizens. To introduce students to the best that has been thought and said; and help engender an appreciation of human creativity and achievement’.
- To prepare students to be confident in themselves, to have a fulfilled and successful life beyond our school – one where they contribute positively to society.
- Our statutory curriculum is just one element in the education of every child. There is time and space in the school day and in each week, term and year to range beyond statutory specifications.
- Provision of a framework of core knowledge around which teachers can develop exciting and stimulating lessons to promote the development of students’ knowledge, understanding and skills as part of the wider school curriculum.
- The wider school curriculum includes an extensive range of opportunities and activities that are routinely available to students, are inclusive and reflect our diverse community.

## Numeracy and literacy

Teachers should take opportunities to develop students’ mathematical fluency, spoken language, reading, writing and vocabulary within their specific discipline and in line with the expectations laid out in our school curriculum statement.

## Purpose of study

Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, students design and make products that solve real and relevant problems within a variety of contexts, considering their own and others’ needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines

such as mathematics, science, engineering, computing and art. Students learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.' Adapted from National Curriculum, DfE, 2014.

## Wolfreton Curriculum Intent

Our design and technology curriculum is underpinned by our Intent statement:

Real problems solved!

## Curriculum Aims

**The Wolfreton curriculum for design technology aims to ensure that all students:**

- understand the nature and range of products embraced by the term 'technology', including artefacts, structures and environments.
- enhance their abilities to generate ideas for designs in response to a wide range of real or realistic technological problems. Students should explore, develop, clarify and communicate those ideas by a variety of constructional and graphic means, with and without the aid of computers.
- seek out, and to draw upon, a range of information sources in order to help them generate, develop or realise their designs.
- understand the characteristics and properties of a variety of materials, and to manipulate those materials by the accurate and effective use of appropriate tools, equipment, techniques, and processes in order to produce an intended outcome.
- appreciate the health and safety issues associated with working with certain materials, tools, equipment and processes, and to take such matters into account when designing their own products, and in their capacities as critics or consumers.
- understand some of the different criteria by which products of Design and Technology from both western and non-western cultures can be criticised and evaluated with respect to both their design and functionality.

## Building on prior learning

**What can students do by the end of KS2?**

### Design

- use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups

- generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

#### Make

- select from and use a wider range of tools and equipment to perform practical tasks, such as cutting, shaping, joining and finishing, accurately
- select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

#### Evaluate

- investigate and analyse a range of existing products
- evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- understand how key events and individuals in design and technology have helped shape the world

#### Technical knowledge

- apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- understand and use mechanical systems in their products, such as gears, pulleys, cams, levers and linkages
- understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs, buzzers and motors
- apply their understanding of computing to programme, monitor and control their products.

### What are the knowledge/skills gaps?

Generally, the technical knowledge is not covered in as much depth as design process activities. Students have limited exposure to mechanical systems and electronic systems in most primary schools. Some students arrive with limited understanding of computer programmes, although most have covered basic coding in primary school.

Lack of workshop facilities means many students arrive with limited fine motor skills with application to hand tools such as saws and drills.

### KS3 Baseline expectations

- Ability to use different media to research
- Communicate designs using a range of techniques
- Have an understanding of basic tools and equipment and how to use them safely
- Use basic literacy skills to discuss existing products

- Show knowledge of existing materials

## Curriculum Structure

By the end of KS3 all students will be able to relate Design Technology to the real world, have a growing technical knowledge of Design Technology in a variety of material areas including food, graphics, textiles, and materials. Be able to problem solve a solve real contextualised briefs in a variety of materials. They will also know how to critique and evaluate their own work and the work of others.

### KS3 Technical knowledge

- understand and use the properties of materials and the performance of structural elements to achieve functioning solutions
- understand how more advanced mechanical systems used in their products enable changes in movement and force
- understand how more advanced electrical and electronic systems can be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs]
- apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors], and control outputs [for example, actuators], using programmable components [for example, microcontrollers]

### KS3 Designing and making principles

- understand that all design and technological practice takes place within contexts which inform outcomes
- identify and understand client and user needs through the collection of primary and secondary data
- demonstrate an ability to write a design brief and specifications from their own and others' considerations of human needs, wants and interests
- investigate factors, such as environmental, social and economic challenges, in order to identify opportunities and constraints that influence the processes of designing and making
- explore and develop their ideas, testing, critically analysing and evaluating their work in order to inform and refine their design decisions thus achieving improved outcomes.
- investigate and analyse the work of past and present professionals and companies in the area of design and technology in order to help inform their own ideas
- use different design strategies, such as collaboration, user-centred design and systems thinking, to generate initial ideas and avoid design fixation
- develop, communicate, record and justify design ideas, applying suitable techniques, for example: formal and informal 2D and 3D drawing; system and schematic diagrams; annotated sketches; exploded diagrams; models; presentations; written notes; working drawings; schedules; audio and visual recordings; mathematical modelling; computer-based tools

- design and develop at least one prototype that responds to needs and/or wants and is fit for purpose, demonstrating functionality, aesthetics, marketability and consideration of innovation
- make informed and reasoned decisions, respond to feedback about their own prototypes (and existing products and systems) to identify the potential for further development and suggest how modifications could be made

In relation to at least one of the material categories, students are required to develop and apply in-depth knowledge by:

- selecting and working with appropriate materials and components in order to produce a prototype
- using appropriate and accurate marking out methods including: measuring and use of reference points, lines and surfaces; use templates, jigs and/or patterns; work within tolerances; understand efficient cutting and how to minimise waste
- using specialist tools and equipment, appropriate to the materials or components used (including hand tools, machinery, digital design and manufacture), to create a specific outcome
- using specialist techniques and processes to shape, fabricate, construct and assemble a high-quality prototype, including techniques such as wastage, addition, deforming and reforming, as appropriate to the materials and/or components being used
- using appropriate surface treatments and finishes for functional and aesthetic purposes

### Key subject skills

AO1	AO2	AO3	AO4
Identify, investigate and outline design possibilities to address needs and wants.	Design and make prototypes that are fit for purpose.	Analyse and evaluate: <ul style="list-style-type: none"> <li>• design decisions and outcomes, including for prototypes made by themselves and others</li> <li>• wider issues in design and technology.</li> </ul>	Demonstrate and apply knowledge and understanding of: <ul style="list-style-type: none"> <li>• technical principles</li> <li>• designing and making principles.</li> </ul>

### Assessment

Assessment of skills and knowledge of all years at the start of the year informs planning and teaching and learning, this establishes individual starting points. This is used in conjunction with whole school data to set challenging targets for all students. Capability is assessed through a mastery of: knowledge and understanding, designing and making and the development of informed attitudes and opinions. The wide-ranging content naturally lends itself to a variety of assessment strategies which can be used to

focus teaching and support on student needs and in recognising achievement. Use of such assessment strategies ensures that students have experienced a successful and balanced learning in all areas.

## Curriculum Sequencing

In KS3, design technology is taught in a four-way rotation alongside food technology and textiles. As such, the units are relatively short in KS3 and focuses on the core subject knowledge to equip students with the key skills needed for future life and study. Students can opt to continue to study design and technology at KS4 and currently follow the OCR specification.

### Key Stage 3: Year 7 – Long Term Planning

	Rotation 1 – Design Technology	Rotation 2 – Design Technology	Rotation 3 – Textiles	Rotation 4 – Food Technology
<b>Knowledge</b>	<p><b><u>Timber Manufacturing</u></b></p> <ul style="list-style-type: none"> <li>• Technical Understanding</li> <li>• Sweet Dispenser Manufacture</li> <li>• How to manufacture a high-quality functional prototype</li> <li>• Introduction to workshop skills / hand tools</li> </ul> <p><u>Technical Knowledge</u></p> <p>Material properties Timbers</p> <ul style="list-style-type: none"> <li>- types of timber</li> <li>- stock forms</li> <li>- source of timbers</li> </ul>	<p><b><u>Polymer Manufacturing</u></b></p> <ul style="list-style-type: none"> <li>• Technical Understanding</li> <li>• Phone Holder Manufacture</li> </ul> <p><u>Technical Knowledge</u></p> <p>2.6 polymers</p> <ul style="list-style-type: none"> <li>- types of polymers</li> <li>- stock form</li> </ul>	<p><b><u>Materials (Textiles)</u></b></p> <p>Explore and use woven and non-woven fabrics, understanding the properties and possible other uses of each.</p> <p><u>Technical Knowledge</u></p> <p>Basic workings of the sewing machine. Material properties. Pattern cutting</p>	<p><b><u>Diet and health</u></b></p> <ul style="list-style-type: none"> <li>• A balanced diet</li> <li>• Food ingredients – Properties of food (taste, raising agents and food spoilage/browning reactions) Why we eat food</li> <li>• Nutrients, Balanced Diet,</li> <li>• Fruit and Vegetables,</li> <li>• Starchy Carbohydrates,</li> <li>• Protein,</li> <li>• Dairy Alternatives,</li> <li>• Oils and Spreads</li> </ul> <p><u>Technical knowledge</u></p> <p>1.2-The Eatwell Guide Healthy Diet, 4.6- Traffic Light Food Label, 1.7 Energy Needs</p> <p><u>Food Provenance</u></p>

				5.2- Food waste 5.1 -Where foods come from Food Ingredients
<b>Skills</b>	<u>Design</u> Communicating design ideas <u>Making</u> Timbers – processes used to use to make products from timber. - Shaping - Deforming - Joining - Finishing <u>Evaluation</u> Testing and evaluating ideas and products <u>Health and safety</u> Working safely - general safety -PPE -Safe use of tools and equipment	<u>Design</u> 1.9 Communicating design ideas - isometric  <u>Making</u> 1.12 working safely 2.6 Polymers – process used to make products from polymers - forming (line bender) - Shaping processes  <u>Evaluation</u> 1.11 Testing and evaluating ideas and products  <u>Health and safety</u> 1.12 working safely - general safety -PPE -Safe use of tools and equipment	<u>Design</u> Analysis of existing products to aid design process Identifying buyer and user Communication of design ideas (sketch, colour, annotation and samples)  <u>Making</u> Use of the sewing machine and hand embroidery Use of a range of textiles equipment – e.g. pins, fabric scissors. Key elements taught – right side, turning, snipping of corners.  <u>Evaluation</u> Evaluation of self, subject and end product  <u>Health and safety</u> In and around the textiles classroom Use of tools and equipment Able to identify unsafe practice.	<u>Making</u> 7.1-Preparation for practical lessons (Hygiene routines) Weighing and Measuring (Inc. liquids) 7.4-Use of oven (timings and visual checks) Use of hob (melting) 7.2-Knife skills (bridge and claw, safe use of chopping boards) 7.3-Preparing fruit and vegetables - Peeling cutting and slicing Sieving, melting, mixing, rubbing in and shaping. Binding dry ingredients  <u>Evaluation</u> Sensory Evaluation Aroma, Mouthfeel, Sensory Evaluation, Sensory Descriptors  <u>Health and safety</u> Use of correct tools and equipment (7.5) Food hygiene (3.3) Personal hygiene (7.1) kitchen safety (3.1) Oven, hob and kettle safety (7.4, 7.5) Knife safety (7.2)

<b>Subject specific vocabulary and key terms</b>	Natural and Man-Made Timber properties Quality control Health and safety Tools, Equipment techniques and skills Manufacturing processes Product Assembly Accuracy Product analysis Millimetres	Properties of Polymers User needs Strip Heater Vacuum Former Health and safety Modelling Accuracy and precision Ergonomics and anthropometrics Measurements	Sewing machine Fabric Pin Needle ACCESS FM Woven and Non-woven Function Quality Measurements (pattern cutting)	Bacteria Baking Best before date Bridge hold Use by date Claw hold Knife skills Climate change Danger zone Nutrients Eat well guide Temperature control Microorganisms Sensory qualities Carbohydrates Fat Protein Vitamins Minerals
<b>Assessment</b>	KMP 1 Timbers Knowledge KMP2 Making skills  Make & H&S procedures M1, M2, M3 Technical Knowledge T1, T2, T3	KMP 1 Polymers Knowledge KMP2 Making skills Make Technical Knowledge	KMP1 Design and labelling task, including -product analysis	KMP1 – Food safety KMP2 – Practical making skills  Knife skills and food hygiene and safety

### Key Stage 3: Year 8 – Long Term Planning

	Rotation 1 – Design Technology Metals Unit	Rotation 2 – Design Technology CAD/CAM Unit	Rotation 3 – Design Technology Papers and Card Unit	Rotation 4 – Food Technology
<b>Knowledge</b>	<p><b><u>Metal Manufacturing</u></b></p> <ul style="list-style-type: none"> <li>• Technical Understanding</li> <li>• Pewter Casting and Storage Manufacture</li> </ul> <p><u>Technical Knowledge</u></p> <p>1.2 Identifying client and users' needs</p> <p>1.8 Design stages</p> <p>2.4 Timbers</p>	<p><b><u>Context informing possible outcomes</u></b></p> <ul style="list-style-type: none"> <li>• How existing products can help produce design solutions</li> <li>• Picture frame</li> </ul> <p><u>Technical Knowledge</u></p> <p>1.7 The work of past and present designers</p> <p>- Product analysis</p> <p>2.1 Material properties</p> <p>4.1 New and emerging technologies</p>	<p><b><u>Packaging</u></b></p> <p><u>Technical Knowledge</u></p> <p>2.3 Paper and board</p> <p>- how paper and board are made</p> <p>- Types of paper and board</p> <p>- Process used to make product from paper and board</p> <p>1.2 Identifying client and user needs</p>	<p><b><u>Diet and health</u></b></p> <ul style="list-style-type: none"> <li>• Healthy Eating guidelines</li> <li>• Healthy Eating dishes</li> </ul> <p><u>Diet and Health</u></p> <p>Why we eat food</p> <p>Nutrients, Balanced Diet,</p> <p><u>Technical knowledge</u></p> <p>1.7 energy balance</p> <p>1.8 (part) nutritional needs</p> <p>3.1 temperature control</p> <p>4.6 traffic light labelling</p>
<b>Skills</b>	<p><u>Design</u></p> <p>1.10 developing prototypes, testing process, hand tools and machine</p> <p>1.11 Testing and evaluating ideas</p> <p><u>Making</u></p> <p>1.12 working safely</p> <p><u>Evaluation</u></p> <p>1.11 Testing and evaluating ideas and products</p> <p><u>Health and safety</u></p> <p>1.12 working safely</p>	<p><u>Design</u></p> <p>1.9 Communicating design ideas</p> <p>- freehand sketches</p> <p>- Isometric</p> <p>- working drawings</p> <p>- CAD modelling</p> <p><u>Making</u></p> <p>1.12 working safely</p> <p>2.2 selecting materials</p> <p><u>Evaluation</u></p> <p>1.11 Testing and evaluating ideas and influence</p> <p>Processes used to make products</p>	<p><u>Design</u></p> <p>1.9 Communicating design ideas</p> <p>freehand sketches</p> <p>working drawings</p> <p><u>Making</u></p> <p>1.12 working safely</p> <p><u>Evaluation</u></p> <p>1.11 Testing and evaluating ideas and products</p> <p><u>Health and safety</u></p> <p>1.12 working safely</p> <p>general safety</p>	<p><u>Making</u></p> <p>7.1-Preparation for practical lessons (Hygiene routines)</p> <p>Weighing and Measuring (Inc. liquids)</p> <p>7.2-Knife skills (bridge and claw, safe use of chopping boards)</p> <p>7.3-Preparing fruit and vegetables – Peeling cutting and slicing, Straining, mixing, rubbing in and shaping.</p> <p>7.4 using the cooker – hob</p> <p>7.5 using equipment – basic equipment</p> <p>7.6 cooking Methods – Cooking with water, Cooking with Fat,</p>

	<ul style="list-style-type: none"> <li>- general safety</li> <li>-PPE</li> <li>-Safe use of tools and equipment</li> </ul>	<u>Health and safety</u> 1.12 working safely <ul style="list-style-type: none"> <li>- general safety</li> <li>-PPE</li> <li>-Safe use of tools and equipment</li> </ul>	<ul style="list-style-type: none"> <li>-PPE</li> <li>-Safe use of tools and equipment</li> </ul>	7.11 sauce making  <u>Evaluation</u> Sensory Evaluation Aroma, Mouthfeel, Sensory Evaluation, Sensory Descriptors  <u>Health and safety</u> Use of correct tools and equipment (7.5) Food hygiene (3.3) Personal hygiene (7.1) kitchen safety (3.1) Oven, hob and kettle safety (7.4, 7.5) Knife safety (7.2)
<b>Subject specific vocabulary and key terms</b>	New and emerging technologies Properties of metals Pewter casting process Health and safety Introduction to CAD/ CAM Shaping with precision and accuracy Isometric drawing Evaluating and reflecting 3D modelling and testing	Innovation, functional, appealing products User centred design Iterate design Design influences User feedback and testing Innovation through designing Existing product analysis Modelling & CAD/CAM New and emerging technologies	Identification of design requirements Design influences Communication and presentation of ideas 3D modelling	Bacterial contamination Fibre Pasteurisation Dietary Al Dente Cardiovascular disease Stroke Tooth decay Coronary heart disease Obesity Dietary guidelines Fat soluble vitamins Milk sugars Monosaccharide Disaccharide Protein alternatives Saturated fats

				Simmering Temperature probe
<b>Assessment</b>	KMP1 - Metals Core knowledge KMP2 - Final prototype  Design – D5 Make – M2, M3 Evaluate – E3 Technical Knowledge – T1, T2 & T3	KMP1 - Analysis work KMP2 - Design ideas and Making  Design – D5 Make – M2 & M3 Evaluate – E2 Technical Knowledge – T1 Modelling CAD/CAM Analysis	KMP1 Packaging net KMP 2 3D model	KMP1 – Food safety KMP2 – Practical making skills  Food, Nutrition and Health Food safety Food Science

### Key Stage 3: Year 9 – Long Term Planning

	Rotation 1 – Design Technology	Rotation 2 – Textiles	Rotation 3 – Food Technology
<b>Knowledge</b>	<p><b><u>Mini NEA Design and manufacture – clock project</u></b></p> <ul style="list-style-type: none"> <li>Informing possible outcomes</li> <li>Icon Design Influences</li> </ul> <p><u>Technical Knowledge</u></p> <p>1.1 context: informing possible outcomes 1.2 Identifying client and users’ needs 1.7 the work of past and present Designers 1.8 Design stages</p>	<p><b><u>Textiles Skills and Techniques</u></b></p> <p>Explore a range of textiles skills across hand machine and dye/colour applications. Review properties of materials, identifying and justifying end uses.</p> <p><u>Technical Knowledge</u></p> <p>2.7 Textiles - equipment - sewing machines</p> <p>Workings of the sewing machine. Material properties. Application of-</p>	<p><b><u>Multicultural dishes</u></b></p> <ul style="list-style-type: none"> <li>Labelling and packaging</li> <li>Allergens</li> <li>Reasons for food choice</li> <li>Cooking a selection of multicultural dishes</li> </ul> <p><u>Technical knowledge</u></p> <p>1.1 why do we eat food? 3.1 temperature control 4.5 what’s on a label 4.6 traffic light labelling 4.7 allergens 4.8 Factors affecting food choice 4.10 international cuisine</p>

		<p>Applique Tie dye Stencil Embroidery Batik Fabric crayon Button (using CAD CAM – laser)</p> <p>2.2 selecting materials</p>	
<b>Skills</b>	<p><u>Design</u> 1.9 communicating design ideas - free hand sketching - working drawings - isometric 1.10 developing prototypes, testing process, hand tools and machine 1.11 Testing and evaluating ideas (knowledge regarding virtual modelling)</p> <p><u>Making</u> 1.10 Developing prototypes 1.12 working safely 2.2 selecting materials</p> <p><u>Evaluation</u> 1.7 the work of past and present designers 1.11 Testing and evaluating ideas and products</p> <p><u>Health and safety</u> 1.12 working safely</p>	<p><u>Design</u> 1. 9 Communication of design ideas - sketches</p> <p><u>Making</u> Use of the sewing machine, hand embroidery and application of buttons and beads. Use of a range of textiles equipment – e.g. pins, fabric scissors. Use of colour in textiles (resist methods) Tie dye, stencil, batik.</p> <p><u>Evaluation</u> 1.11 Testing and evaluating ideas and products Evaluation of self, subject and end product</p> <p><u>Health and safety</u> 1.2 Working safely In and around the textiles classroom Use of tools and equipment</p>	<p><u>Making</u> 7.1-Preparation for practical lessons (Hygiene routines) Weighing and Measuring (Inc. liquids) 7.2-Knife skills (bridge and claw, safe use of chopping boards) 7.3-Preparing fruit and vegetables - Peeling cutting and slicing, Straining, mixing, rubbing in and shaping. 7.4 using the cooker – hob, oven 7.5 using equipment – basic equipment 7.6 cooking Methods – Cooking with water, Cooking with Fat, Cooking with heat 7.11 sauce making</p> <p><u>Evaluation</u> Sensory Evaluation Aroma, Mouthfeel, Sensory Evaluation, Sensory Descriptors</p>

	<ul style="list-style-type: none"> <li>- general safety</li> <li>-PPE</li> <li>-Safe use of tools and equipment</li> </ul>	Able to identify unsafe practice outlining how it will be put right.	<u>Health and safety</u> Use of correct tools and equipment (7.5) Food hygiene (3.3) Personal hygiene (7.1) kitchen safety (3.1) Oven, hob and kettle safety (7.4, 7.5) Knife safety (7.2)
<b>Subject specific vocabulary</b>	Innovation Functional Appealing User centred design Iterative process CAD/CAM Annotated sketches Design influences	Sewing machine Fabric Pin Needle Production methods Woven, Non-woven and knitted Resist methods of dyeing Production methods (one off, batch, mass, JIT) CAD CAM	Allergens Seasonal Packaging Labelling Coeliac De seed De skin Fairtrade Factors influencing food choice Eating patterns Physical activity level Availability Global warming Food security High risk foods Intensive farming Locally sources Organic farming
<b>Assessment</b>	KMP1 - Analysis of existing products KMP2 - Design ideas and solutions  Design – D1, D2, D3 Evaluation – E1, E2, E3 Technical Knowledge –T1 (CAD), T3	KMP1 - Driving test, threading of the machine, applique sample KMP2 - Artist research and moodboard (ICT task)	KMP1 – reason for food choice, Labelling and packaging KMP2 – Practical making skills

Assessment Criteria		Emerging	Developing	Secure	Exceeding
Designing	D1 Research	Basic research information that helps students understand the project.	A range of different sources to collect research relevant to the project.	A wide range of sources and media used to present research gathered. Students can explain how the research will help the design process.	Students conduct independent research to gather information for their user's needs. They can explain in detail how the research will help them.
	D2 User Needs and Requirements	Basic awareness of the users needs and requirements through labelling of work.	Some awareness of the user needs and requirements through labelling. Begins to respond to identified needs.	Good awareness of the user needs and requirements through annotation. Responds to identified needs in design work.	Excellent awareness of the user needs and requirements through detailed annotation. Responds in detail to identified needs throughout design work.
	D3 Creative Designing and Communication	Limited ideas presented which include some basic labelling. Drawing, modelling and CAD skills are to a basic standard.	Several design solutions presented showing some creativity. Annotation explains how designs meet the user needs. Drawing, modelling and CAD skills are to a sufficient standard.	A good range of creative, detailed design solutions are presented. Detailed annotation explains how the designs function and meet the user needs. Drawing, modelling and CAD skills are to a good standard and include a range of techniques.	A wide range of creative and innovative design solutions are presented. Thorough annotation explains how the designs function and meet the user needs. Drawing, modelling and CAD skills are to a high standard and employ a range of techniques and styles.
Making	M1 Planning	Student can follow basic instructions and identify some next steps of their practical work.	Student can follow instructions well and effectively identifies the next steps of their practical work.	Students are able to plan their making with some independence identifying future stages. Some consideration given to quality control.	Students are able to independently and confidently plan their making identifying future stages. Good consideration given to quality control throughout.
	M2 Use of Tools / Safety	Basic use of tools and equipment with some assistance. Limited awareness of health and safety.	Correct use of tools and equipment with some skill shown. Appropriate awareness of health and safety.	Independent selection and use of tools and equipment with good skills demonstrated. Good awareness of their own and others health and safety.	Independent selection and justification of tools and equipment used with high level of skills demonstrated. Excellent awareness of their own and others health and safety throughout.
	M3 Final Product	Product is unfinished / finished to a basic standard showing limited accuracy and quality.	Product is finished to an adequate standard showing some accuracy and quality.	Product is finished to a good standard and shows good attention to detail, accuracy and quality.	Product is finished to a high standard and shows excellent attention to detail. Accuracy and quality of the product is to a high standard in all aspects.
Evaluating	E1 Improvements and Modifications	Basic strengths and weaknesses of the final product identified through labelling.	Strengths and weaknesses of the final product are identified through annotation and / or sketching.	A range of strengths and weaknesses of the final product are identified through annotation and / or sketching covering a range of key areas / requirements. Some suggestions proposed to further improve the product.	A wide range of strengths and weaknesses of the final product are identified through detailed annotation leading to sketches which show thorough, realistic improvements.
	E2 Analysis and Evaluation of Research	Basic understanding of the project shown. Limited awareness of how research can influence the design process.	Adequate understanding of the project shown. Some awareness of how research can have an impact on the design process.	Good understanding of the project shown with awareness of how research can impact on the design process and how this can be used.	Thorough understanding of the project shown. Uses a range of techniques to evaluate the impact research can have on the design process. Good use of research to influence the design process.
	E3 Testing and Evaluating	Limited methods used to test the product with a basic evaluation carried out.	Appropriate methods used to test the product with an evaluation carried out showing some critical understanding.	A range of methods used to test the product with an evaluation carried out showing good critical understanding. Consideration given to user needs / requirements.	A range of appropriate methods used to test the product with an evaluation carried out showing a high level of critical understanding. Good consideration given to user needs / requirements.
Technical Knowledge	T1 Manufacturing Processes	Basic understanding of manufacturing processes used in classroom environments.	Good understanding of manufacturing processes used in classroom environments with some awareness of where these could be used in industry.	Good understanding of a range of manufacturing processes used in the design and manufacturing sector. Students can identify where these could be used in industry and the outcomes they could create.	Excellent understanding of a range of manufacturing processes used in the design and manufacturing sector. Students can confidently identify where these could be used in industry and describe how these outcomes could be created.
	T2 Materials and Components	Basic understanding of materials and components. Student is able to identify / name them.	Sufficient understanding of where materials and components come from and their usage / function in design and technology.	Good understanding of where traditional and modern/smart materials and components come from and their usage / function in design and technology. Good awareness of material working properties.	Detailed understanding of where traditional and modern/smart materials and components come from and their usage / function in design and technology. Excellent application and awareness of material working properties.
	T3 Language and Vocabulary	Basic identification / understanding of key words and meanings.	Good understanding and use of key words and meanings in written work. Some spelling / grammatical errors present.	Accurate understanding and use of key words and technical vocabulary in written work. Information is conveyed appropriately. Few spelling / grammatical errors present.	Accurate and confident understanding and use of key words and technical vocabulary throughout written work. Information is conveyed effectively. Little or no spelling / grammatical errors present.
	T4 Mechanical Systems	Basic understanding of mechanical systems used in classroom environments.	Basic understanding of mechanical systems used in classroom environments with some awareness of where these could be used in real-world contexts..	Good understanding of a of range mechanical systems used in the design and manufacturing sector. Students can identify where these could be used in real-world contexts and the outcomes they could create.	Excellent understanding of a range of mechanical systems used in the design and manufacturing sector. Students can confidently identify where these could be used in real-world contexts and describe how these outcomes operate.

Key Stage 4 Year 10 – Long Term Planning – OCR GCSE Design & Technology

	Autumn term	Spring term	Summer term
<b>Knowledge</b>	<p><u>Design thinking and communication</u></p> <ul style="list-style-type: none"> <li>• How to design solutions can be communicated to demonstrate their suitability</li> <li>• Use graphical techniques to communicate idea, modifications, construction, and technical considerations, using 2D and 3D sketches with notes, sketch modelling, exploded drawings and mathematical modelling</li> <li>• Using digital technologies and design tool (9.8 section)</li> </ul> <p><u>Usability when design prototypes</u></p> <ul style="list-style-type: none"> <li>• Understand the importance consideration when designing prototypes</li> <li>• Impact of a solution on a user’s lifestyle</li> <li>• The ease of use and inclusivity of design solutions</li> <li>• Ergonomic consideration and anthropometric data to support the ease of use</li> <li>• The importance of aesthetics</li> </ul> <p><u>Materials, properties and uses - Skills based Desk Tidy project</u></p> <p><u>Timber/Polymers materials and manufacturing</u></p> <ul style="list-style-type: none"> <li>• Know and understand Physical and working properties</li> <li>• How easy they are to work with</li> <li>• How well they fulfil the required function of products in different context</li> </ul> <p><u>Learning from Existing products and practice</u></p> <ul style="list-style-type: none"> <li>• Learn how to explore and critique existing design, systems, and products to identify features and methods</li> <li>• Identify materials, components and processes that have been used</li> <li>• How fashion, trends or style have influenced existing products</li> <li>• Marketing and branding influences</li> <li>• Impact on usability</li> </ul>		<p>NEA project commences summer term and continues into year 11.</p> <p>From summer term Y10 onwards lessons will be split between NEA (2 per week) and theory (1 per week)</p> <p><b><u>Core Technical principles</u></b></p> <ul style="list-style-type: none"> <li>• new and emerging technologies</li> <li>• energy generation and storage</li> <li>• developments in new materials</li> <li>• systems approach to designing</li> <li>• mechanical devices</li> <li>• materials and their working properties</li> </ul> <p><b><u>Specialist technical principles</u></b></p> <ul style="list-style-type: none"> <li>• selection of materials or components</li> <li>• forces and stresses</li> <li>• ecological and social footprint</li> <li>• sources and origins</li> <li>• using and working with materials</li> <li>• stock forms, types, and sizes</li> <li>• scales of production</li> <li>• specialist techniques and processes</li> <li>• surface treatments and finishes</li> </ul> <p><b><u>Designing and making principles</u></b></p> <ul style="list-style-type: none"> <li>• investigation, primary and secondary data</li> </ul>

	<ul style="list-style-type: none"> <li>• Impact on the environment</li> <li>• Life cycle assessment</li> <li>• The work of past and present</li> </ul> <p><u>Engineering unit - Lamp manufacture</u></p> <ul style="list-style-type: none"> <li>• Methods used in manufacturing at different scales of production</li> <li>• Manufacturing processes used for larger scale of production</li> <li>• Methods of ensuring accuracy and efficiency when manufacturing at scale and in the workshop</li> <li>• Know and understand the benefits and implication of incorporating new and emerging technologies into production</li> </ul>	<ul style="list-style-type: none"> <li>• environmental, social, and economic challenge</li> <li>• the work of others</li> <li>• design strategies</li> <li>• communication of design ideas</li> <li>• prototype development</li> <li>• selection of materials and components</li> <li>• tolerances</li> <li>• material management</li> <li>• specialist tools and equipment</li> <li>• specialist techniques and processes</li> </ul>
<b>Skills</b>		
<b>Subject specific vocabulary and key terms</b>	<a href="#"><u>GCSE (9-1) Design and Technology - The changes in terminology and language</u></a>	
<b>Assessment</b>		

#### Key Stage 4: Year 11 – Long Term Planning – OCR GCSE Design & Technology

	Autumn	Spring	Summer
<b>Knowledge</b>	<p>The coursework element of the course offers a unique opportunity in the curriculum for learners to identify and solve real problems by designing and making products or systems.</p> <p>Learners will be prepared to participate confidently and successfully in an increasingly technological world; and be aware of, and learn from, wider influences on design and technology, including historical, social/cultural, environmental and economic factors.</p> <p>(All of the above theory content interlinks with the current section of NEA delivered at this stage)</p>		<p>Revision and examination preparation, covering the following key areas, developed throughout the course.</p> <p><b><u>Core Technical principles</u></b></p> <ul style="list-style-type: none"> <li>• new and emerging technologies</li> <li>• energy generation and storage</li> <li>• developments in new materials</li> <li>• systems approach to designing</li> </ul>

	<p><b><u>Technical principles</u></b></p> <p><b>Core knowledge and understanding</b> is presented in five clear and distinct topic areas:</p> <ul style="list-style-type: none"> <li>• design and technology and our world</li> <li>• smart materials</li> <li>• electronic systems and programmable components</li> <li>• mechanical components and devices</li> <li>• materials</li> </ul> <p>Learners are required to study all the content in these five areas, to ensure they have a broad knowledge and understanding of design and technology and that they are able to make effective choices in relation to which materials, components and systems to utilise within design and make activities.</p> <p><b>In-depth knowledge and understanding</b> is presented in six clear and distinct topic areas:</p> <ol style="list-style-type: none"> <li>a. electronic systems, programmable components &amp; mechanical devices</li> <li>b. papers &amp; boards</li> <li>c. natural &amp; manufactured timber</li> <li>d. ferrous &amp; non-ferrous metals</li> <li>e. thermoforming &amp; thermosetting polymers</li> <li>f. fibres &amp; textiles</li> </ol> <p>Learners are required to study at least one of these six areas, to ensure they have an in-depth knowledge and understanding of a specific material area and/or components and systems to support their design and make activities.</p> <p><b><u>Designing and making principles</u></b></p> <p><b>Core knowledge and understanding</b> that learners are required to develop and apply is presented in ten clear topic areas:</p> <ul style="list-style-type: none"> <li>• understanding design and technology practice</li> <li>• understanding user needs</li> </ul>	<ul style="list-style-type: none"> <li>• mechanical devices</li> <li>• materials and their working properties</li> </ul> <p><b><u>Specialist technical principles</u></b></p> <ul style="list-style-type: none"> <li>• selection of materials or components</li> <li>• forces and stresses</li> <li>• ecological and social footprint</li> <li>• sources and origins</li> <li>• using and working with materials</li> <li>• stock forms, types, and sizes</li> <li>• scales of production</li> <li>• specialist techniques and processes</li> <li>• surface treatments and finishes</li> </ul> <p><b><u>Designing and making principles</u></b></p> <ul style="list-style-type: none"> <li>• investigation, primary and secondary data</li> <li>• environmental, social, and economic challenge</li> <li>• the work of others</li> <li>• design strategies</li> <li>• communication of design ideas</li> <li>• prototype development</li> <li>• selection of materials and components</li> <li>• tolerances</li> <li>• material management</li> <li>• specialist tools and equipment</li> <li>• specialist techniques and processes</li> </ul>
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	<ul style="list-style-type: none"> <li>• writing a design brief and specifications</li> <li>• investigating challenges</li> <li>• developing ideas</li> <li>• investigating the work of others</li> <li>• using design strategies</li> <li>• communicating ideas</li> <li>• developing a prototype</li> <li>• making decisions</li> </ul> <p>Learners are required to cover all the content in these ten areas, to ensure they are able to apply a broad knowledge and understanding of design and technology principles within design and make activities.</p> <p><b>In-depth knowledge and understanding</b> are presented in five clear topic areas:</p> <ul style="list-style-type: none"> <li>• selecting and working with materials and components</li> <li>• marking out</li> <li>• using tools and equipment</li> <li>• using specialist techniques</li> <li>• using surface treatments and finishes</li> </ul> <p>Learners are required to cover all the content in these five areas, in relation <b>to at least one of the topic areas (a to f)</b> identified in the in-depth knowledge and understanding section of technical principles.</p>	
<p><b>Skills</b></p>	<p>Numeracy – Measuring materials effectively, tolerances.</p> <p>Literacy – in spoken and written communication, analysis and evaluation.</p> <p>IT Skills – use of CAD 2D design, tinkercad, sketch up, as well as Microsoft package.</p> <p>Self-management – planning the time of the practical activities. Learning to be an independent learner with equipment.</p> <p>Creative thinking –use of different materials and processes to produce creative products.</p> <p>Problem solving – Identifying the correct equipment and technique to use for a given task.</p>	

<b>Subject specific vocabulary and key terms</b>	<a href="#">GCSE (9-1) Design and Technology - The changes in terminology and language</a>	
<b>Assessment</b>	<p>Theory activity which covers the whole project embedding assessment opportunities throughout</p> <p>Focused Assessed pieces Final Design - Design Final Piece - Manufacture</p> <p>Success Criteria Demonstrate the knowledge of tools, materials and skills gained during their practical activities. Reflect on how they used components, tools and materials and what went well. Evaluate what went well and determine what and how they would change certain parts in future development. Evaluate how effectively they have used information sources, using the results of their research to inform their judgements when developing products Adapt ideas to that of their clients wishes. Adapt their methods of manufacture to changing circumstances as they solve technical problems Identify a broad range of criteria for evaluating their products, clearly relating their findings to environmental, ethical, and social and cultural dimensions.</p>	<p>Core technical principles A mixture of short answer questions covering a breadth of technical knowledge and understanding</p> <p>Specialist technical principles Several short answer questions (2–5 marks) and one extended response to assess a more in-depth knowledge of technical principles</p> <p>Designing and making principles A mixture of short answer and extended response questions.</p> <p>Students should know and understand that all design and technology activities take place within a wide range of contexts. They should also understand how the prototypes they develop must satisfy wants or needs and be fit for their intended use. For example, the home, school, work or leisure.</p>

Key Stage 4 Year 10 – Long Term Planning – WJEC Hospitality

	Autumn term	Spring term	Summer term
<b>Knowledge</b>	<p>Key topics-</p> <p>Health and safety in hospitality and catering provision</p> <p>Food Safety</p> <p>Food related causes of ill health</p> <p>Areas to be visited include-</p> <p>Control of Substances Hazardous to Health Regulations (COSHH) 2002</p> <p>Health and Safety at Work Act 1974</p> <p>Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 2013</p> <p>Documentation: • accident forms • risk assessments. Understanding that employers are responsible for the health and safety training needs of all staff.</p> <p>Understand the principles of Hazard Analysis and Critical Control Points (HACCP) able to identify critical control points considering the risks used to reduce levels.</p> <p>Knowledge of allergies, bacteria and intolerances. Including food poisoning causes, e.g. e-coli and salmonella. Able to identify food labelling laws and safety legislation.</p> <p>Symptoms and signs of food-induced ill health</p> <p>Including visible and non-visible. Understanding the measures to prevent - cross contamination, correct temperature in delivery, storage, preparation and service.</p> <p>Spring term-</p> <p>Areas to be taught (and visited – school canteen)</p> <p>The operation of the front and back of house</p> <p>Customer requirements in hospitality and catering</p> <p>Hospitality and catering provision to meet specific requirements</p>		<p>Key topics-</p> <p>Hospitality and catering providers</p> <p>Working in and working conditions</p> <p>Contributing factors</p> <p>Areas to be visited-</p> <p>Commercial and non-commercial areas of hospitality and catering</p> <p>Types of services</p> <p>Including – food, residential and leisure service</p> <p>Standards and ratings</p> <p>Employment and roles in the industry – front of house and kitchen</p> <p>Contracts</p> <p>Supply and demand</p> <p>Needs of the industry</p>

	<p>Pupils will be taught specific workflow areas, including front of house, counter, delivery, preparation and storage.</p> <p>Large and small kitchen equipment – glass chiller, floor standing mixer etc.</p> <p>Documentation and administration of a working kitchen.</p> <p>Dress code.</p>	
<b>Skills</b>	<p>Practicals</p> <p>Cakes and Biscuits</p> <p>Scones – Rubbing in method</p> <p>Victoria Sponge cake - Creaming</p> <p>Swiss roll - Whisking</p> <p>Gingerbread - Melting</p> <p>Pastry</p> <p>Shortcrust – Sweet or savoury pie</p> <p>Flakey – Sausage rolls</p> <p>Filo – Samosas</p> <p>Puff – Chicken en crouete</p>	<p>Practicals</p> <p>Dough-</p> <p>Bread</p> <p>Pizza</p> <p>Sweet loaf</p> <p>Sauce-</p> <p>Lasagne</p> <p>Mac and cheese</p> <p>Meringue-</p> <p>Lemon meringue pie</p> <p>Garnishes</p>
<b>Subject specific vocabulary and key terms</b>	<p>COSHH</p> <p>Health and safety</p> <p>Risk</p> <p>Allergies</p> <p>Cross contamination</p> <p>Rubbing in</p> <p>Whisking</p>	<p>Commercial and non commercial</p> <p>Residential and non-residential</p> <p>Gueridon</p> <p>Vending</p> <p>Michelin stars</p> <p>sous-chef</p>

Key Stage 4 Year 11 – Long Term Planning – AQA GCSE Food and Nutrition

	Autumn term	Spring term	Summer term
<b>Knowledge</b>	<p>Content: Introduction to year 11 GCSE Food preparation and nutrition. NEA 1 – Total Marks 30 Sections A – Research Students carry out research into the ingredients to be investigated. The research will demonstrate how ingredients work and why. The outcome of the research should clearly inform the nature of the practical investigation and be used to establish a hypothesis or prediction for the food investigation task. Section B - Investigations Students carry out practical investigations, related to the hypothesis or prediction, which demonstrate understanding of how ingredients work and why. Students will record the results of the practical investigation. Section C –</p>	<p>content: NEA 2 – Total Marks 70 Start NEA 2 Sections A – Research Students will research and analyse the: life stage/dietary group or culinary tradition related to the task. Section B – Demonstrating technical skills • Demonstrate technical skills in the preparation and cooking of three to four dishes.</p> <p>NEA 2 – Total Marks 70 Section C Planning for final menu As a result of demonstrating technical skills, students will provide explanation for the final three dishes related to e.g. ingredients, processes, technical skills, nutrition, food provenance, cooking methods and portion size. A time plan will be produced for the final three dishes demonstrating dovetailing of different processes Section D: Making the final dishes Students will prepare, cook and present a menu of three dishes within a single period of no more than three hours. Section E: Analyse and evaluate Students will carry out sensory evaluation and record the results for all of their practical dishes. For the final dishes, students will carry out and record nutritional analysis, costing and identify improvements to their dishes.</p>	<p>Students develop an advanced, higher level understanding of the follow topics: Buying and storing food, The food safety principles when buying and storing food, Preparing, cooking and serving food, Bacterial contamination and food poisoning, Factors which influence food choice, Food choice related to religion, culture, ethical and moral beliefs and medical conditions, Food labelling and marketing influences, British and international cuisines, Food products from British tradition and two different cuisines, Macronutrients, Micronutrients, Vitamins and Minerals, Food Science, Selecting</p>

	<p>Evaluation Students will analyse and evaluate the results of the investigation and reflect upon their findings. Explanations will demonstrate how the results can be applied in practical food preparation and cooking.</p>		<p>appropriate cooking methods Selection of appropriate preparation, cooking methods and times to achieve desired characteristics. Functional properties or proteins, carbohydrates, fats and oils. Food provenance Environmental impact and sustainability of food. The primary and secondary stages of food processing and production. how processing affects the sensory and nutritional properties of ingredients, technological developments to support better health and food production including fortification and modified foods with health benefits and the efficacy of these.</p>
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			Student demonstrate advanced, higher level theoretical knowledge of food preparation and nutrition from Sections 1 to 5 as well as exam technique and the ability to answer multiple choice and
<b>Skills</b>	<p>Skill development: Investigate the working characteristics and the functional and chemical properties of a particular ingredient through practical investigation. They will produce a report which will include research into 'how ingredients work and why'. Students will conduct, analyse and evaluate practical investigations. They will produce a report which will include research into 'how ingredients work and why'.</p> <p>Mathematics/Science Links: Measuring Weighing Science investigations into certain area/ingredients Analysis of data</p>	<p>Students demonstrate advanced and higher level knowledge, skills and understanding in relation to the planning, preparation, cooking, presentation of food and</p> <p>application of nutrition related to the chosen task. 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>Mathematics/Science Links: Measuring Weighing Aeration, whisking, rubbing in. Time planning of final menu Analysis of data</p>	Exam questions will be assessed in the above theoretical topic/content weekly.

<b>Subject specific vocabulary and key terms</b>	<a href="#">Subject specific vocabulary</a> <a href="#">AQA   Command words</a>		
<b>Assessment</b>	Baseline Assessment GCSE NEA 1 Deadline – NEA Component Assessed, Marked and moderated (30 total marks achievable out of 100 for the NEA components. Both NEA 1 (30 marks) and 2 (70 marks) = 50% of the Final GCSE Grade)	GCSE NEA 2 Deadline – NEA Component Assessed, Marked and moderated (70 total marks achievable out of 100 for the NEA components. Both NEA 1 (30 marks) and 2 (70 marks) = 50% of the Final GCSE Grade)	GCSE Food preparation and nutrition. Exam component – 1:45hrs (50% of Final GCSE grading)