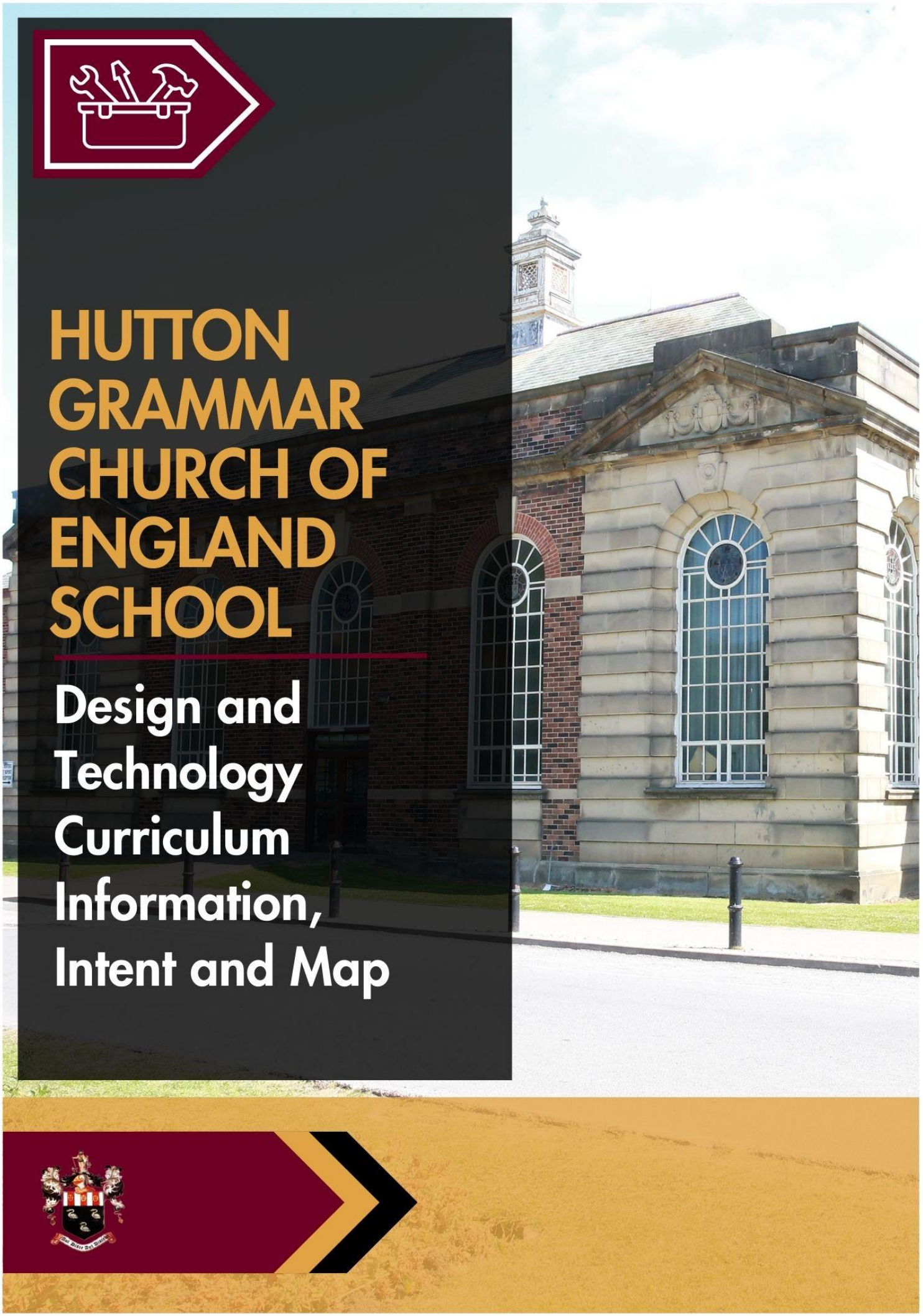

# HUTTON GRAMMAR CHURCH OF ENGLAND SCHOOL

## Design and Technology Curriculum Information, Intent and Map

# Contents



"In your relationship with one another have the same mindset as Christ Jesus "

Philippians 2

# Staff

Mrs N Furnell (Subject Leader)

Mr A Crookes

Ms E Houghton (Cooking and Nutrition)

Mr M Jordan

Mr A Shaw

Intent:

- Support all KS3 students in achieving their flight path or above at KS3
- Support all KS4 and 5 Students in achieving their target grade at GCSE and GCE examination
- To maintain a high level of safety and safe working practices within the department.
- To challenge students into becoming creative, responsible, articulate designers.
- To allows to students to develop skills outside of the assessment framework.
- To prepare students for work, academia, industry and collaborative practice.
- Numeracy and literacy will be focused during the design and make tasks across all year groups.
- Skills and knowledge from all curriculum areas will be used to underpin, support and reinforce learning in the department and across the school.
- An iterative approach to knowledge and skills based delivery will be applied across all year groups. This will encourage critical thinking and independence within the students. A level of resilience will be encouraged in the students as they endeavour to solve problems and create a robustness in their designs and thinking.
- The design cycle will be used to give structure to their learning and planning as they move through and develop their individual projects and outcomes. Building confidence in their ability to approach new topics with a development of new skills.

- Our Church of England whole school ethos will be applied within the department to support and encourage a robustness within the department. Design technology is a subject that asks the students to draw upon a wide skill set. Romans 12:6

*"We have different gifts, according to the grace given to each of us"*

Exodus 31:1-6

*"Then the LORD said to Moses, "See, I have chosen Bezalel son of Uri, the son of Hur, of the tribe of Judah, and I have filled him with the Spirit of God, with wisdom, with understanding, with knowledge and with all kinds of skills to make artistic designs for work in gold, silver and bronze, to cut and set stones, to work in wood, and to engage in all kinds of crafts. Moreover, I have appointed Oholiab son of Ahisamak, of the tribe of Dan, to help him. Also I have given ability to all the skilled workers to make everything I have commanded you"*

Design and Technology Programmes of Study: Key Stage 3 National Curriculum in England

Purpose of Study

Design and Technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils 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. Pupils 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.

Aims

The national curriculum for design and technology aims to ensure that all pupils:

- Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- 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
- Understand and apply the principles of nutrition and learn how to cook

Attainment Targets

By the end of key stage 3, pupils are expected to know, apply and understand the matters, skills and processes specified in the programme of study

Subject Content in Key Stage 3

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of domestic and local contexts and industrial contexts.

When designing and making, pupils should be taught to:

Design

- Use research and exploration, such as the study of different cultures, to identify and understand user needs
- Identify and solve their own design problems and understand how to reformulate problems given to them
- Develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations
- Use a variety of approaches to generate creative ideas and avoid stereotypical responses
- Develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools

Make

- Select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture
- Select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties

Evaluate

- Analyse the work of past and present professionals and others to develop and broaden their understanding
- Investigate new and emerging technologies
- Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups
- Understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists

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

- Apply computing and use electronics to embed intelligence in products that respond to inputs and control outputs using programmable components

Cooking and Nutrition

As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.

Pupils should be taught to:

- Understand and apply the principles of nutrition and health
- Cook a repertoire of predominantly savoury dishes so that they are able to feed themselves and others a healthy and varied diet
- Become competent in a range of cooking techniques
- Understand the source, seasonality and characteristics of a broad range of ingredients

# Curriculum Map

| Year | Project 1 | Project 2 | | Project 3 | Project 4 | | Project 5 | Project 6 |
|---|---|---|---|---|---|---|---|---|
| 7 | Introduction to Timber- Desk Tidy Your task is to design and make a Desk Tidy that will hold your pens and pencils and prevent them from 'disappearing'.<br><br>Introduction to Plastics-Key Fob This firm has asked you to design and make an attractive acrylic key fob which may be sold in the company's shops. This project is also an introduction to the workshop. You will learn that safety of yourself and others is the most important aspect.<br><br>Skills:<br>DESIGNING<br>Understanding contexts, users and purposes, Generating, developing, modelling and communicating ideas<br>EVALUATING<br>Own ideas and products, Existing products<br>MAKING<br>Planning, Practical skills and techniques<br>TECHNICAL KNOWLEDGE<br>Making products work | Introduction to Papers & Boards-Ugly Head Spatial awareness is a key skill for a designer. Spatial awareness is the ability to know how objects relate to each other in space or in a three dimensional world. Your task is to design a net for a cube. A net is a flat shape that can fold into a 3D object. On this net you are to draw six sides of a head.<br><br>Skills:<br>DESIGNING<br>Understanding contexts, users and purposes, Generating, developing, modelling and communicating ideas<br>EVALUATING<br>Own ideas and products, Existing products<br>MAKING<br>Planning, Practical skills and techniques<br>TECHNICAL KNOWLEDGE- Making products work | | Introduction to CAD/ CAM-Earphone Tidy Your task is to design and prototype an earphone tidy. It will be made from high impact polystyrene. Students create their own brief following their research<br><br>Skills:<br>DESIGNING<br>Understanding contexts, users and purposes, Generating, developing, modelling and communicating ideas<br>EVALUATING<br>Own ideas and products, Existing products<br>MAKING<br>Planning, Practical skills and techniques<br>TECHNICAL KNOWLEDGE-Making products work | Introduction to Plastics - Phone stand Introduction to Timber Snakebox. In this project you will use creative drawing techniques to illustrate your ideas, and using a simple mechanism animate your design. You will also be asked to use the workshop safely and use a range of materials and equipment to help the manufacture of your piece.<br><br>Skills:<br>DESIGNING<br>Understanding contexts, users and purposes, Generating, developing, modelling and communicating ideas<br>EVALUATING<br>Own ideas and products, Existing products<br>MAKING<br>Planning, Practical skills and techniques<br>TECHNICAL KNOWLEDGE- Making products work | | Food & Nutrition: learning key skills in the kitchen including knife skills, mixing, baking, hob work, food hygiene and routines of the kitchen. Healthy living and food safety and equipment. | Food & Nutrition: Design Brief/Context Design and make a healthy packed lunch that includes a range of savoury and sweet food products that are suitable to be included in a school lunch box, are presented as individual portions and can be easily eaten without cutlery or mess |

| Year | Project 1 | Project 2 | | Project 3 | Project 4 | | Project 5 | Project 6 |
|---|---|---|---|---|---|---|---|---|
| 8 | Design Brief/Context Your design task is to create a spatula that will meet the ergonomic needs of many people while fitting in with a distinct market niche.<br><br>Design Brief/Context Vehicle Light- In this project you will manufacture an electronic circuit board, gaining an appreciation of electronic components; you will also design and make the case using industrial manufacturing processes.<br><br>Skills:<br>DESIGNING<br>Understanding contexts, users and purposes, Generating, developing, modelling and communicating ideas<br>EVALUATING<br>Own ideas and products, Existing products MAKING<br>Planning, Practical skills and techniques<br>TECHNICAL KNOWLEDGE<br>Making products work | Design Brief/Context You will design, prototype and make a working clock inspired by a design movement. You should use no more than five colours of acrylic and the clock should be no larger than 150 x 150mm. It should use a quartz movement and be powered by one AA battery<br><br>Skills:<br>DESIGNING<br>Understanding contexts, users and purposes, Generating, developing, modelling and communicating ideas<br>EVALUATING<br>Own ideas and products, Existing products<br>MAKING<br>Planning, Practical skills and techniques<br>TECHNICAL KNOWLEDGE<br>Making products work | | Design Brief/Context Three dimensional computer aided design has become normal in industry. A 3D CAD drawing will be used to design the product, show a realistic image and then manufactured using Cam or rapid prototyping.<br><br>Skills:<br>DESIGNING<br>Understanding contexts, users and purposes, Generating, developing, modelling and communicating ideas<br>EVALUATING-Own ideas and products, Existing products<br>MAKING<br>Planning, Practical skills and techniques<br>TECHNICAL KNOWLEDGE<br>Making products work | Design Brief/Context Pop Up Card- You have been asked to develop a campaign based around a postal camper van. All items must be drop flat and be delivered with a scene and information about a destination.<br><br>Skills:<br>DESIGNING<br>Understanding contexts, users and purposes, Generating, developing, modelling and communicating ideas<br>EVALUATING<br>Own ideas and products, Existing products<br>MAKING<br>Planning, Practical skills and techniques<br>TECHNICAL KNOWLEDGE<br>Making products work | | Food & Nutrition: Students will be learning about Special diets including ages, allergies, intolerance, religion, vegetarians and vegans. They will practice and develop skills in blending, shaping and assembly, dough, knife skills, Frying, baking, and making sauces. | Food & Nutrition: Design Brief/Context Design and make a range of savoury and sweet food products that are healthy alternatives to the junk food that can be bought premade from shops and fast food restaurants. |

| Year | Project 1 | Project 2 | | Project 3 | Project 4 | | Project 5 | Project 6 |
|---|---|---|---|---|---|---|---|---|
| 9 | Design Brief/Context The Automata museum wishes to sell a range of mechanical toys which young children can buy and play with at home. The mechanical toy should be simple, cheap to manufacture and attract the interest of young children. It should be relatively cheap to buy so that the children can afford to buy it with their pocket money. The product should represent a folk or fairy tale by using characters from the tale.<br><br>Skills:<br>DESIGNING<br>Understanding contexts, users and purposes, Generating, developing, modelling and communicating ideas<br>EVALUATING<br>Own ideas and products, Existing products<br>MAKING<br>Planning, Practical skills and techniques<br>TECHNICAL KNOWLEDGE<br>Making products work | Design Brief/Context<br>Design and make a USB powered light that will be used as a task light when working in the evenings. You will use a combination of materials to produce your light and it will be additionally decorated with Vinyl. You to consider the wants and needs of a given user when designing the product.<br><br>Skills:<br>DESIGNING<br>Understanding contexts, users and purposes, Generating, developing, modelling and communicating ideas<br>EVALUATING<br>Own ideas and products, Existing products<br>MAKING<br>Planning, Practical skills and techniques<br>TECHNICAL KNOWLEDGE<br>Making products work | | Design Brief/Context<br>Olympic promotional products- Some products have strong historic links. In this project you are to consider some historic references and use design theories to make them relevant to today's consumer<br><br>Skills:<br>DESIGNING Understanding contexts, users and purposes, Generating, developing, modelling and communicating ideas<br>EVALUATING-Own ideas and products, Existing products<br>MAKING Planning, Practical skills and techniques TECHNICAL KNOWLEDGE Making products work | Design Brief/Context<br>Designing using research, stylising products for a market. Use of Accurate 2D design, batch production line bending.<br><br>Skills:<br>DESIGNING<br>Understanding contexts, users and purposes, Generating, developing, modelling and communicating ideas<br>EVALUATING<br>Own ideas and products, Existing products MAKING<br>Planning, Practical skills and techniques<br>TECHNICAL KNOWLEDGE<br>Making products work | | Food & Nutrition:<br>Science – Investigation into the working characteristics of ingredients. • Nutritional analysis – Understanding the contents of recipes and being able to improve and analyse the value of ingredients. Food provenance – Looking closely to a range of countries and understanding the route of methods of cooking, farming and traditional ingredients | Food & Nutrition:<br>Multicultural foods and food science |

## Curriculum Map Key Stage 4

We follow the Edexcel GCSE (9-1) Design and Technology (1DT0) Graphics Pathway: 1DT0/1B – Papers and boards & RM Pathway: 1DT0/1F – Timbers specification. We Follow the AQA GCSE (9-1) Food Preparation and Nutrition (8585)

| | Half Term 1 | Half Term 2 | | Half Term 3 | Half Term 4 | | Half Term 5 | Half Term 6 |
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| **10** | Mini Project. That includes theory for syllabus and how to create design and research sheets for the GCSE.<br><br>Theory: 1.1 The impact of new and emerging technologies 1.2 Critical evaluation of new and emerging Technologies. 1.3 How energy is generated and stored. 1.4 Developments in modern and smart materials.<br><br>Food.<br>Nutrition and practical skills. | Mini Project. That includes theory for syllabus and how to create design and research sheets for the GCSE.<br><br>Theory: 1.5 The functions of mechanical devices used to produce different sorts of movements 1.6 How electronic Systems provide functionality to products and processes 1.7 The use of programmable components<br><br>Food.<br>Nutrition and practical skills. Mock NEA2 research and practical skills. | | Mini Project. That includes theory for syllabus and how to create design and research sheets for the GCSE.<br><br>Theory: 1.8 – 1.12 The Categorisation of the types, properties and structure of materials.<br><br>Food<br>Food safety and factors effecting food choice. (Exam question practice) | Mini contextual challenge<br><br>Theory: 1.13 All design and Technological practice takes place within contexts which inform outcomes 1.14 Investigate environmental, social and economic challenges<br><br>Food<br>Nutrition and practical skills. Mock NEA2 research and practical skills | | Revision<br><br>Theory:<br>-Design contexts. - The sources, origins, physical and working properties of specialist material - Selection of specialist material -The impact of forces and stresses. -Stock forms - Alternative processes -Specialist techniques, tools, equipment - Appropriate surface Treatments and finishes<br><br>Food<br>Mock NEA1 food science investigation. Specific dietary needs. | Contextual challenge – Investigate<br><br>Theory: 1.15 Investigate and analyse the work of past and present professionals and companies Revision & Mock Exams<br><br>Food<br>Theory and food science exam questions |

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| **11** | Contextual challenge – Investigate Specification Design<br><br>Theory: 1.16 Use different design strategies to generate initial ideas and avoid design fixation<br><br>Food<br>Final NEA1 food science. Worth 15% of final grade. | Contextual challenge Design Review Develop – Review Revision & Mock Exams<br><br>Theory:<br>1.17 Develop, communicate, record and justify design ideas<br><br>Food<br>Final NEA1 food science. Worth 15% of final grade. Start NEA2 worth 35% of final grade. 1st November. | | Contextual challenge – Manufacture<br><br>Food NEA2 | Contextual challenge – Manufacture Testing and Evaluation<br><br>Food NEA2 and exam theory | | Prepare for assessment of NEA Revision & Exams<br><br>Food. Revision & Exams | Revision & Exams |