Curriculum Overview

Design Technology

Subject Leader

Mrs C Byrne

Intent

Key stage 3

Aims Year 9

Our main aim is to continue building on the knowledge and skills undertaken in Design Technology in the middle schools. Continuing to develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world.

- Building and applying a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes.
- Critique, evaluate and test ideas and products and the work of others.
- Understand and apply the principles of nutrition and learn how to cook.

Assessment

Assessment will take place 3 times throughout the year (every 2 terms).
These assessments will cover the 5 sections from the KS3 Technology.

1 - Investigation/context
2 - Design development and planning
3 - Making
4 - Testing and evaluation
5 - Knowledge

Term 1

Students will undertake a baseline test when joining College to identify gaps in learning from middle school. This will encompass all elements of Design Technology including Food.

Term 4

Students will undertake a Food end of unit test at the beginning of term 4.

Term 6

Students will undertake an end of Year test where they will then be assessed to check progress within Year 9 again encompassing all elements of KS3 Design Technology.

Implementation

Key stage 3

In Year 9 students undertake 5 different projects which allow us to fill in the gaps in knowledge from Year 7 and 8. Students undertake a Jewellery unit (Focus material Metal) , Textiles (Focus - sustainable materials, social statements, stencil printing and heat transfer) A small Light project (Focus - sustainable material, electronics, CAD/CAM), Food Prep and Nutrition (Focus - Health eating and nutrition), Alessi Phone holders (Focus material Plastic and environmental impact).

A range of methods are used in Technology to ensure students are retaining knowledge and skills. Regular recall sessions have been implemented into SOL both as starters and plenaries.

Students record their learning in work booklets which helps to structure their knowledge and help them build a secure foundation of Design Technology. Allowing them to make informed decisions for GCSE.

Intent

Key stage 4 Design Technology

GCSE Design Technology will prepare our students to participate confidently and successfully in an increasing technological world. Students will gain awareness and learn from a wider influence on Design Technology including historical, social, cultural, environmental and economic factors. Students will get the opportunity to work creatively when designing and making and apply technical and practical expertise.

At GCSE students study core technical and design and making principles, including a broad range of design processes, materials techniques and equipment. They will also have the opportunity to study specialist technical principles in more depth - our key material focus throughout Yr10 will be timber based materials.

Assessment

- Students are formally assessed every term.
- The intent is that assessments will cover the areas that students are assessed on by the examination board. For GCSE this will reflect the 50% coursework and 50% exam.
- The intent is that mock exams assessments will be used repeatedly throughout KS4 to prepare students for their final exams

Implementation

Key stage 4

AQA Specification is used to create mini projects in Design Technology that cover core knowledge. Knowledge is built through practical work as well as theory lessons. Students will use starters, plenaries and questioning throughout practical sessions to embed core knowledge.
PLC task sheets are used with RAG feedback to help students independently identify the areas they need to further develop.

A range of resources are available to support students' knowledge and understanding, GCSE textbooks, Seneca Learning, PG online resources, revision textbooks and workbooks.

Intent

Key stage 4

3D Design.

Knowledge and understanding are delivered through a variety of learning experiences and approaches. In Year 10 a range of various projects are undertaken to allow students to build the skills required for their two pieces of coursework. Students are encouraged to identify, select, develop, explore and communicate their own ideas in a personal way. There are two components, comprising a 'portfolio' selected from the course of study and an 'externally set assignment' with themes set by the exam board, resulting in a 10 hour practical exam.

This course provides a range of creative, exciting and stimulating opportunities to develop and explore their personal interests in Design, with the main focus of Product Design.

Implementation

Key stage 4

AQA Specification is used to create mini projects where knowledge and practical skills are built through practical work, exploring the work of others to inspire and develop a personal response.
Students are encouraged to build on a range of drawing and practical skills encompassing modern technologies such as CAD/CAM alongside more traditional focussed practical tasks.

Assessment
Students are given feedback every term to allow them to identify the areas they need to further develop.
Key Assessment points:
AO1: Develop ideas through investigations, demonstrating critical understanding of sources.
AO2: Refine work by exploring ideas, selecting and experimenting with appropriate media, materials, techniques and processes.
AO3: Record ideas, observations and insights relevant to intentions as work progresses.
AO4: Present a personal and meaningful response that realises intentions and demonstrates understanding of visual language

Allocated curriculum time

Design Technology	**Y9**	**Y10**	**Y11**
Fortnightly lesson allocation	2	6	5
Food 3 year Course	Year 9 option (Food)	Year 10	Yr11
Fortnightly lesson allocation	4	4	4

Year 9

Term	Units
1	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. Students will develop an understanding of the different routes available at GCSE options. **Jewellery Project - Designing for a teenage market** (½ a year Group then swop to mini light project) **Understanding the DT route to GCSE.** Understanding metals, properties and uses. Research skills (Understanding teenage market). Specification writing. Designing for a client. Working with copper and making bracelets. Working safely within the metal workshop. Evaluating final pieces.
2	**Textiles Project - Creating sustainable statement bags** (½ a year Group then swop to mini light project) **Understanding the Textiles route for GCSE.** Understand how we make social statements around the world we live in. Focusing on areas such as environmental concerns, fast fashion, social media, the news - current affairs. Developing skills in stencil making and graffiti printing. Using heat transfer to create logos. Creating templates and constructing a small calico bag.
3	**Food Project -Introduction to Food cooking skills, Healthy eating and nutrition.** **Understanding the food route at GCSE.** Students are taught how to cook and apply the principles of nutrition and healthy eating. Developing basic Cooking skills, knife skills, bread and pastry making. Evaluating their practical cooks.
4	**3D DESIGN Project – Small light project.** (½ a year Group then swop to jewellery and Textiles) **Understanding the 3D Design route at GCSE.** Develop ideas through research (inspirational starting points - Victorian Toy Theatre, Shadow Puppetry and Light Dioramas). Recording ideas for designs using inspiration starting points. Refine ideas through practical modelling using CAD/CAM.
5	**3D DESIGN Project – Small light project.** (½ a year Group then swop to jewellery and Textiles) Refine ideas towards an outcome through practical modelling. Creating electronic circuits. Present a final functional lamp inspired by inspirational starting points.
6	**Combing DT and 3D Design - Alessi Phone holder Project** Understanding the characteristics of Alessi design company. Understanding the environmental issues using plastic. Developing and designing a product for a company. Designing and Making a fun and creative phone holder.

Year 9 Food and Nutrition GCSE (Option group 3 years)

Term	Unit
1	Students will learn: Hygiene and food storage - They will learn about food hygiene and safety including how food hygiene systems work in the food industry. Mould investigation - scientific experiment to help understand Food spoilage and contamination. Healthy eating and nutrition - Understanding how to read the Eatwell guide, the importance of healthy eating and the use of nutrients in our bodies. They will learn about the different food groups and the importance of having a balanced diet. Food choice - understanding the factors which affect our food choices. They will learn how to make increasingly more complex dishes.
2	Students will learn: Health related diseases, diet, nutrition and health. Obesity, Cardiovascular (Coronary heart disease CHD), Rickets, Osteoporosis, Dental decay. All students will undertake MSNP Young Chef and the Year competition - where their key focus is aimed around seasonal and local sourced produce. They will plan, prepare and take part in a competition across Year 9 classes. They will learn how to make increasingly more complex dishes.
3	Students will learn about: The working properties of carbohydrates in foods. Focusing on sugars and fibre. Cooking Methods - Understanding why we cook food and how heat is transferred to food. Food labelling - Understanding why food labels are used, how we interpret the information they give us, what the law says on the food labels, how food marketing influences our food choices. Environmental impact and sustainability - understanding our food sources, how food production affects the environment, sustainable food sources. They will continue to learn how to make increasingly more complex dishes.
4	Students will learn: Food provenance - Where foods and ingredients originally come from before they reach food manufactures, retailers and the food industry. Understanding where and how ingredients are grown, gathered, reared and caught. Organic farming, genetically modified food (GM) and seasonal foods. They will continue to learn how to make increasingly more complex dishes.
5	Students will learn: Further understanding of food choices focusing on British and International cuisines. Being able to define cuisine and develop an understanding of the features and characteristics of British and other countries' cuisines. They will continue to learn how to make increasingly more complex dishes.
6	Students will learn: Food Science - focusing on Carbohydrates, Fats and oils Understanding the functional and chemical properties of food. They will continue to learn how to make increasingly more complex dishes.

Year 10 Food and Nutrition GCSE (Option group – 3 years)

Term	Unit
1	Students will learn: Buying food - food safety advice when buying and storing foods, what to look for, types of food storage and temperature control. Cooking Methods - Understanding why we cook food and how heat is transferred to food. Carbohydrates - The working properties of carbohydrates in foods. Focusing on sugars and fibre. What happens when carbohydrates are cooked in different recipes - understanding the meaning of gelatinisation, dextrinisation, caramelisation Protein - the function of protein in the body, main sources, effects of deficiency and excess, amount required at different life stages. They will learn how to make increasingly more complex dishes.
2	Students will learn: Protein - How proteins react to food preparation processes and cooking methods Understanding what Denaturation and coagulation means, how gluten and foams are formed. Raising agents - what is meant by raising agents, how raising agents are used and how they work. Looking at Air and Carbon dioxide gas, chemical, mechanical and biological. Gluten experiment - using a scientific experiment to understand how Gluten is formed within different wheat sources. Milk processing - primary and secondary stages of processing, how processing affects the sensory and nutritional properties of ingredients. They will learn how to make increasingly more complex dishes.
3	Students will learn: Fats recap - further developing an understanding of fats in our bodies. Revision techniques - preparing for unit tests. Developing a knowledge of how to successfully answer exam questions, key terms and the requirements of the exam questions. They will learn how to make increasingly more complex dishes.
4	Students will learn: Vitamins and minerals fortification how and why some foods are nutritionally modified, fortified and the use of additives in food products. Raising agents - what is meant by raising agents, how raising agents are used and how they work. Looking at Air and Carbon dioxide gas, chemical, mechanical and biological. Milk processing - primary and secondary stages of processing, how processing affects the sensory and nutritional properties of ingredients. Food poisoning - types of bacteria that cause poisoning, how bacteria can grow and multiply, how foods can be contaminated, controlling and preventing bacterial contamination. Sustainable foods - food security, sustainability of food production, Fairtrade. They will learn how to make increasingly more complex dishes.
5	Students will learn:

	Enzymic Browning - how enzymes affect our foods, the process of enzymic browning, oxidation, methods to prevent enzymic browning. Energy requirements - the function of energy in our bodies, sources, deficiency and excess effects, amounts required at different life stages. BMR, PAL. Sensory evaluations and costing.- how senses influence food choices, how we taste food, sensory testing methods aiding evaluating practical sessions. Costings and portion sizes. Food safety recap They will learn how to make increasingly more complex dishes.
6	Students will learn: NEA practice - International cuisines The intention of this unit is to introduce students to the NEA format. They will learn what is involved in a food science investigation, being taught how to plan, carry out and evaluate a series of tests on different food items. Students will also learn how to design a meal to meet a brief.

Year 10 Food and Nutrition GCSE (option group - 2 years)

Term	Unit
1	Students will learn: Hygiene and food storage - They will learn about food hygiene and safety including how food hygiene systems work in the food industry. Mould investigation - scientific experiment to help understand Food spoilage and contamination. Healthy eating and nutrition - Understanding how to read the Eatwell guide, the importance of healthy eating and the use of nutrients in our bodies. They will learn about the different food groups and the importance of having a balanced diet. Food choice - understanding the factors which affect our food choices. Cooking Methods - Understanding why we cook food and how heat is transferred to food. The working properties of carbohydrates in foods. Focusing on sugars and fibre. What happens when carbohydrates are cooked in different recipes - understanding the meaning of gelatinisation, dextrinisation, caramelisation They will learn how to make increasingly more complex dishes.
2	Students will learn: Protein - the function of protein in the body, main sources, effects of deficiency and excess, amount required at different life stages. How proteins react to food preparation processes and cooking methods Understanding what Denaturation and coagulation means, how gluten and foams are formed. Raising agents - what is meant by raising agents, how raising agents are used and how they work. Looking at Air and Carbon dioxide gas, chemical, mechanical and biological. Gluten experiment - using a scientific experiment to understand how Gluten is formed within different wheat sources. They will learn how to make increasingly more complex dishes.
3	Students will learn: Milk processing - primary and secondary stages of processing, how processing affects the sensory and nutritional properties of ingredients. Fats - the function of fats in the body, main sources, deficiency or excess of fat in our diet, the amounts of fats we require at different life stages. Chemical structure, aeration, emulsification, plasticity, shortening. Food poisoning - types of bacteria that cause poisoning, how bacteria can grow and multiply, how foods can be contaminated, controlling and preventing bacterial contamination. Food labelling - Understanding why food labels are used, how we interpret the information they give us, what the law says on the food labels, how food marketing influences our food choices. They will learn how to make increasingly more complex dishes.
4	Students will learn: Vitamins and minerals - understanding the function within the body, what food we source them from, effects of deficiency and excess, amounts we require at different life stages. Vitamins and minerals fortification how and why some foods are nutritionally modified, fortified and the use of additives in food products. Enzymic browning - how enzymes affect our foods, the process of enzymic browning, oxidation, methods to prevent enzymic browning. Sensory evaluation and costing - how senses influence food choices, how we taste food, sensory testing methods aiding evaluating practical sessions. Costings and portion sizes. Food processing and production - Understanding the primary and secondary processing and production of various foods. how processing affects the sensory and nutritional properties of ingredients. They will learn how to make increasingly more complex dishes.
5	Students will learn: Food provenance - Where foods and ingredients originally come from before they reach food manufactures, retailers and the food industry. Understanding where and how ingredients are grown, gathered, reared and caught. Organic farming, genetically modified food (GM) and seasonal foods. Sustainable foods - food security, sustainability of food production, Fairtrade. Energy requirements - the function of energy in our bodies, sources, deficiency and excess effects, amounts

	required at different life stages. BMR, PAL. Food safety recap - continuing to learn about food hygiene and safety including how food hygiene systems work in the food industry. They will learn how to make increasingly more complex dishes.
6	Students will learn: NEA practice - International cuisines The intention of this unit is to introduce students to the NEA format. They will learn what is involved in a food science investigation, being taught how to plan, carry out and evaluate a series of tests on different food items. Students will also learn how to design a meal to meet a brief.

Year 11

Term	Unit
1&2	**NEA 1 - ASSESSMENT 1 - NON EXAM** The aim of this unit is for students to be able to carry out a scientific investigation. The intention is also that skills and knowledge gained in year 10 will not be lost throughout the Non Exam Assessment window.
2&3	**NEA 2 - ASSESSMENT 2 - NON EXAM** The aim of this unit is for students to be able to complete the Food Preparation Assessment. The intention is also that skills and knowledge gained in year 10 will not be lost throughout the Non Exam Assessment window.
3,4,5	**REVISION MATERIALS** The intention of this unit is to teach students how to apply the knowledge they have learnt to a given question. The intention is also that none of the knowledge learnt in year 10 and earlier in year 11, will be lost.

Year 10 Design Technology

Term	Unit
1	**Yr10 DT - The box project - Part 1** Understanding how to work with Wood and their properties, creating and using wood joints. Understanding how to work safely in the workshop, use of PPE. **Theory - Core technical principles** Natural and manufactured boards

	Specialist technical prinicples Timber based materials
2	**Yr10 DT - The box project - Part 2** Constructing and finishing wood. Developing an understanding of a range of joining methods. Use of the laser cutter and CAD/CAM to create a lid. **Theory - Core technical principles** Metals and alloys **Specialist technical prinicples** Sources and origins and properties
3	**Yr10 DT - Anglepoise light - Part 1** Mini NEA project - Influenced by design movements. Using wood, metal and plastics. **Theory - Core technical principles** Paper and boards **Specialist technical prinicples** Working with timber based materials.
4	**Yr10 DT - Anglepoise light - Part 2 - producing a functional light.** Creating a light circuit. Creating a professionally finished light. **Theory - Core technical principles** Polymers **Specialist technical prinicples** Commercial manufacturing, surface treatments and finishes.
5	Dragons Den event **PRACTICE NON-EXAM ASSESSMENT (NEA)** The aim of the practice NEA is to allow pupils to experiment with presentation layouts as well as gain confidence completing the research and design skills that are integral to the Exam Board set NEA. A school based design task is set. Students work in groups to design. Model and present ideas to a Dragons Den **Theory - Core technical principles** Industry and enterprise
6	**NON-EXAM ASSESSMENT (NEA)** The aim is that students should be able to design and develop a product for a given context. This is provided by the AQA exam board. Focus of this term - Investigating, primary and secondary data NEA CourseWork - Section A **Designing and making principles.** Initial research - Investigating primary and secondary data. **Theory - Core technical principles** Sustainability and the environment People, culture and society

Year 11 Design Technology

Term	Unit
1-4	**NON-EXAM ASSESSMENT (NEA)** The aim is that students should be able to design and develop a product for a given context. Throughout the NEA the **Design Principles theory** will be covered as students work through the coursework.

	Design and making prinicples **Design:** ● Investigation, primary and secondary data. ● The work of others. ● Design strategies. ● Communication of design ideas and prototypes. **Making:** ● Selection of materials and components. ● Tolerances and allowances. ● Material management and marking out. ● Specialist tools, equipment, techniques and processes. ● Surface treatments and finishes. **Theory lessons will continue throughout term 1-4 for two hours a fortnight.** **Theory - Core technical principles** Production techniques and systems. Informing design decisions. Energy generation and storage. Modern materials and smart materials. Composite materials and technical textiles. Systems approach to designing. Electronic systems processing. Mechanical devices.
1-5	**REVISION MATERIALS** To ensure that pupils are aware of exam knowledge, aware of exam format and are aware of the command words used in their exam. **Theory -**

Year 10 3D Design

Term	Unit
1.	Box project Understanding how to work safely in the workshop, basic tools and equipment. Developing basic joining methods. Working with inspirational starting points, designing for a client.
2	Salad tongs

	Cultural inspiration Learning CAD/ CAM, Laminating wood.
3	Anglepoise light Inspired by Design movements Working with wood, developing further joining methods.
4	Architect unit Designing using traditional drawing skills and CAD. Dragons Den event - students will undertake a real life brief designing buildings for our school site, they will present their ideas to a board of judges. Using communication skills to explain their creative design ideas.
5&6	**Unit One Coursework Portfolio** ● This is 60% of GCSE mark, and is completed between September Year 10 and December Year 11 ● Topics will be developed from projects undertaken within Yr10. ● In this unit candidates will create a portfolio of work that- ❖ Shows the breadth and depth of their skills ❖ Includes at least one sustained project or theme ❖ Demonstrates students' individual interest and skill ❖ Consists of sketchbooks and journals, as well as final products ❖ Shows an understanding of, and response to, the work of other artist

Year 11 3D Design

Term	Unit
1/2	**NEA (60%) -** students continue with their portfolio production. They may continue to develop their initial theme or decide to select another. Students use a range of media to research and look at artists and designers for inspiration. Primary research and development of the theme is crucial and helps students to create their product developments where many practical skills are used and experimented with. Students eventually realise an outcome for their project.
3/4/5	**Practical exam (preparation and completion.) 40%** Students are given a theme by the exam board and have several weeks to research, plan and prepare for the exam. In the final 10-hour (2 day) exam pupils will be in their classroom and will use their plans to create a final practical outcome of their choice.

Year 10 Textiles

Term	Unit
1	**AQA Textiles (art and design)** **60% portfolio - The 90s** Research and complete Textile workshops inspired by the 90s. Exploring the fashion, technology, music and objects that are iconic to the 90s.
2	Continue to research and complete Textile workshops inspired by the 90s.
3	Design and sample development inspired by the workshops and research.

4	Making a final piece inspired by the designs and sample development
5	**60% portfolio - The Movies** Research and Textile workshops inspired by characters, sets and symbolic images
6	Continue to research and complete Textile workshops inspired by movies

Year 11 Textiles

Term	Unit
1/2	**Portfolio (60%) - Movies Project -** Students continue with their portfolio production. They may continue to develop their initial theme or decide to select another. Students use a range of media to research and look at artists and designers for inspiration. Primary research and development of the theme is crucial and helps students to create their sample developments where many practical skills are used and experimented with. Students eventually realise a final outcome for their project which might be based on surface design, a collection of final samples, a Textile based artwork or sculpture, an accessory or a garment/ costume.
3/4/5	**Practical exam (preparation and completion.) 40%** Students are given a theme by the exam board and have several weeks to research, plan and prepare for the exam. In the final 10 hour (2 day) exam pupils will be in their classroom and will use their plans to create a final practical outcome of their choice.