# 3. FIVE YEAR CURRICULUM PLAN
# Key Stage 3 and 4

Subject: Design & Technology

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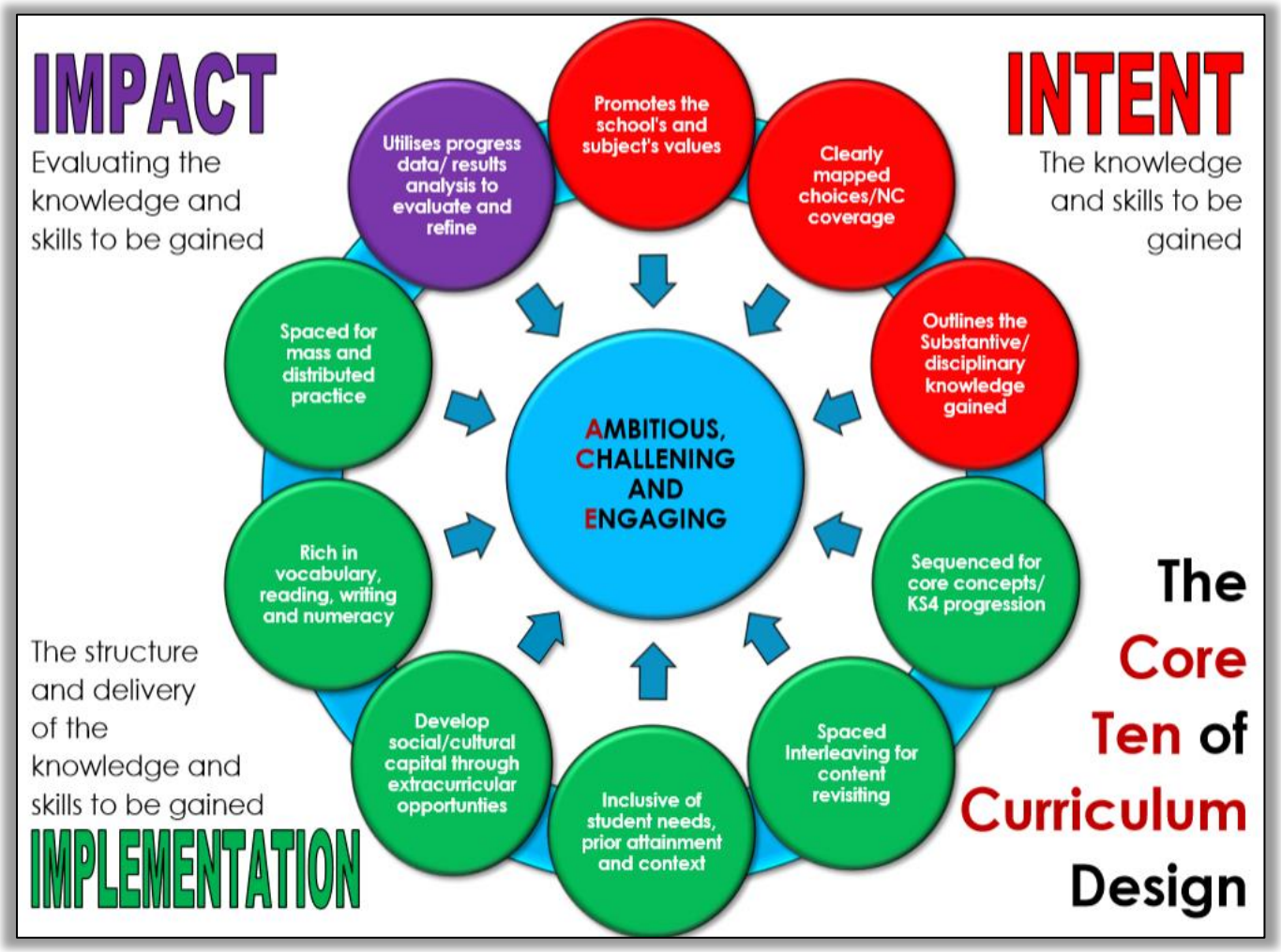


Document(s) which inform this Five Year Curriculum Plan are:

1. Curriculum Intent Overview Plan (KS3 & KS4)
2. Curriculum Implementation Overview (KS3 & KS4)

# KS3 – Year 7 Year Plan

## Intent

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| Aims: | **Food – To know the benefits of following a balanced/healthy. To develop a range practical skills which can be adapted to prepare nutritious meals and dishes from raw Ingredients. To have the knowledge and skills required to be built upon to complete the GCSE Food Preparation and Nutrition course.**<br><br>**Resistant Materials – To develop skills using workshop tools which will enable them to complete basic DIY tasks at home in later life. To gain an understanding of where materials (woods and plastics) come from and their impact on the world around us. To gain some understanding of industrial manufacturing processes in the work place. To gain appropriate knowledge required to make choice on future KS4 choices (Design & Technology and Engineering).**<br><br>**Textiles – To develop skills using hand sewing methods to allow them to carry out basic repairs to textiles products/garments at home. To gain an understanding of where textiles materials come from and their impact on the world around us.**<br><br>**All projects should develop students understanding of careers available in the appropriate sectors relating to Food & Nutrition and Design and Technology.** |
| Academy values: | **Ambitious – In all projects students are encouraged to strive to produce products/dishes which are of the highest quality and push their creativity and skills.**<br>**Brave – Students are required to be brave when undertaking tasks which require the use of new and interesting tools, equipment and processes in the workshop and food room. Students are encouraged to try new foods which they have never tried before.**<br>**Kind – Students are required to work in groups and help each other in most projects. The end user of the product being designed is always considered and the impact on the wider community has to be taken into account.** |

Units of Study:

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| Unit/Topic 1 | Content: | **Introductory Module studied by all of Y7 at the start of the year**<br>To introduce the design process, isometric drawing and to build passion for the subject (they use laser cutter, vacuum former and melt chocolate) | NC Content: | **Design**<br>1,2,3 & 5<br>**Make**<br>Introduction to 1 & 2 but not completed<br>**Evaluate**<br>Introduction to all aspects of evaluation<br>**Technical knowledge**<br>Introduction to 1. |
| | Key Concepts: | Application of the design process, communicating ideas, designing for a market, use of maths in designing (Nets), environmental impact of materials (Plastics), considering others beliefs/opinions. | Powerful Knowledge: | Learning the design process. |
| Unit/Topic 2 | Content: | **Wooden Box**<br>Introduction to practical activities in the workshop. Wood theory, Health and safety, basic hand tools and equipment and wood joining methods. | NC Content: | **Design**<br>1 & 5<br>**Make**<br>1<br>**Evaluate**<br>1<br>**Technical knowledge**<br>1 |

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| | Key Concepts: | Accuracy in marking out cutting and shaping (avoiding waste), environmental impacts of materials (Wood) | Powerful Knowledge: | Health and safety in a workshop.<br>Knowledge of different types of wood, their origins and uses. |
| Unit/Topic 3 | Content: | **Introduction to Food and hygiene.**<br>Introduction to practical activities in the food room and safe/healthy preparation of food. | NC Content: | **Cooking and nutrition**<br>1,2,4 & introduction to 3 |
| | Key Concepts: | What makes a healthy diet, how heat affects food/ingredients. | Powerful Knowledge: | The basic government guidelines for healthy eating.<br>The knowledge and skill require to prepare foods. |
| Unit/Topic 4 | Content: | **Textiles**<br>Introduction to Textiles practical activities.<br>Production of a decorative wall hanging using hand stitching, machine sewing and tie dying | NC Content: | **Design**<br>1,2 & 5<br>**Make**<br>1<br>**Evaluate**<br>1<br>**Technical knowledge**<br>1 |
| | Key Concepts: | The environmental impact of materials (Fabrics), designing for a market, considering others beliefs/opinions. | Powerful Knowledge: | The ability to use and explain textiles manufacturing techniques.<br>Knowledge of different types of textiles materials and their origins. |

## Implementation

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| Progression from KS2: | Basic understanding of 3D drawing, some knowledge of cultural beliefs and festivals, basic use of tolls and equipment used in D&T. | | | |
| Progression to Year 8: | • The design process and application of ACCESSFMM<br>• An understanding of the environmental impact of a range of materials and ingredients<br>• How to draw accurately in isometric<br>• How to use a range of tools in the workshop and kitchen<br>• What constitutes a healthy and balanced diet<br>• Simple hand stitching techniques<br>• The difference between natural and synthetic fibres | | | |
| Spaced Interleaving: | Each module is based around the design process and revisits this frequently while focusing on the individual material area. Each project focuses on investigating a design brief, includes analysis of a relevant product using ACCESSFMM, communication of design ideas through 3D drawing techniques & annotation and evaluation of final products.<br>All projects have strands of environmental impacts running through them which allows for topics to be revisited frequently. | | | |
| Student Needs: | SEND: | Learning screens and lesson notes are printed (on appropriate coloured paper) for those students that require them. Dyslexic students are provided with appropriate coloured exercise books.<br>Seating plans take into account student needs, whether that is grouping SEND students to gain support from an LSA or seating students with an appropriate student who can offer support.<br>Where SEND students do not have an LSA in lessons technician support is provided during practical activities. | Context | With a boy heavy cohort the practical nature of the content provides more student engagement.<br>A high proportion of PPG students is catered for by providing students with the skills required to feed themselves and their families with healthy balanced meals which when cooked from raw/fresh ingredients can be more economical.<br>HPA students are provided with the opportunities to stretch and challenge themselves in order to reach their potential. |

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| | LPA: | LPA - Writing frames and templates are provided for written activities.<br>Introductory module – Pre manufactured nets and formers are provided where necessary<br>Resistant Materials – Templates for marking out finger joints provided<br>Food – Recipes are aimed at the lower students with opportunities for more able to adapt and develop recipes<br>Textiles – Templates for marking out are provided and the range of embellishments to be included are differentiated by ability. | HPA: | HPA – Stretch/Challenge activities are provided in all lessons.<br>Introductory module – Opportunity for students to develop their own packaging net.<br>Resistant materials – Students provided with the opportunity to use more advanced marking tools (marking gauges) to mark out finger joints.<br>Food – Recipes allow for students to adapt and develop the dishes<br>Textiles – The range of embellishments allows HPA students to incorporate a wider range of techniques in their finished product. |
| Extracurricular: | Extra-curricular Food practical sessions available for 6 weeks in rotation with other KS3 year groups.<br>Textiles club available for all KS3 students for a 6 week project. | | | |
| Literacy/Numeracy: | Vocab (tier 2/3): | **Tier 2**<br>Design, Process, Analysis, Evaluate, Net, Risk, Template, Grain, Renewable, Parallel, Perpendicular, Hygiene, Seasonal, Environmental, Ingredients, Consumer, Decorative, Audience, Natural.<br>**Tier 3**<br>Aesthetics, Ergonomics, Function, Manufacture, Isometric, Specification, Annotation, Crating, Rendering, Thermoplastic, Polymer, Vacuum, Tenon saw, Coping saw, Coniferous, Deciduous, Veneers, Lamination, Sustainability, Contamination, Bacteria, Aroma, Sauté, Simmer, Profile, Convection, Conduction, Radiation, Carbohydrates, Protein, Hydration, Shortening, Starch, Gelatinisation, Applique, Hem, Synthetic, Biodegradable, Renewable, Embroidery | Reading: | Student guide, Knowledge organiser and Design Brief. Knowledge book entries for design process, product analysis, isometric drawing, plastics theory. Exit tickets are taken from GCSE papers to develop students understanding of key vocabulary and command words. |
| | Writing: | Introductory module - Extended writing opportunities are included in product analysis, annotation of designs and evaluations. Example responses are modelled by teachers.<br>Food - Extended writing opportunities are included in sensory analysis tasks and evaluation of dishes.<br>Textiles - Extended writing opportunities are included in product analysis, annotation of designs and evaluations | Numeracy: | Introductory module - Drawing and production of box nets including dimensions.<br>Wooden Box (Resistant Materials) - Accurate measurement and calculating spacing of finger joints.<br>Food - Weighing & measuring and calculating timings.<br>Textiles - Accurate measurement in production of hem. |
| Practice: | Mass: | Currently students have 3 assessment points during the year.<br>Assessment point 1 - all students complete an assessment covering the key concepts covered in the introductory module. | Distributed: | Introductory module - Exit tickets are used to practice knowledge gained on writing design criteria (use of ACCESSFMM), isometric drawing and use of plastics on the vacuum former.<br>Wooden box (Resistant Materials) - Exit tickets are used to practice knowledge gained on health and safety in the |

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| | | Questioning focuses on plastics properties and their environmental impact, use of ACCESSFMM when analysing products and communicating packaging ideas through sketches and annotation.<br><br>Assessment point 2 includes a section which is common to all students and again reinforces the practice of the key concepts covered in the introductory module and a second section which focuses on the module they have recently completed. The common questions focus on communicating design ideas for a charity box and evaluation of the designs.<br>Assessment 2 covers the common questions plus questions on<br>Wooden Box - Properties of woods and their environmental impact, health & safety in the workshop and hand tools.<br>Food - heat transfer methods, the eatwell guide, food hygiene and food miles.<br>Textiles - properties of textiles materials, textiles processes (stitch types and tie dyeing) and health & safety.<br>Assessment 3 is common to all students at the end of the year and covers questions on communication of design ideas for food packaging, evaluation of designs, food hygiene, hand tools in the workshop, properties of woods & textiles materials and textiles production processes. | | workshop, properties and uses of woods and applying finishes to woods.<br>Food - Exit tickets are used to practice knowledge gained on health and hygiene, heat transfer methods in cooking and gelatinisation when making starch based sauces.<br>Textiles - Exit tickets are used to practice knowledge gained on decorative techniques, material choices, health & safety and annotation of ideas. |

# KS3 – Year 8 Year Plan

## Intent

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| Aims: | **Food – To know the benefits of following a balanced/healthy diet and the consequences of not following a healthy diet at various life stages. To develop a range practical skills which can be adapted to prepare nutritious meals and dishes from raw Ingredients. To understand where food comes from to enable students to make informed choices taking into account social, moral, ethical and sustainability issues. To have the knowledge and skills required to be built upon to complete the GCSE Food Preparation and Nutrition course.**<br><br>**Resistant Materials/Product Design – To develop skills using workshop tools which will enable them to complete basic DIY tasks at home in later life. To gain an understanding of where materials come from and their impact on the world around us and to have an understanding of different materials and their properties to enable them to make appropriate choices when manufacturing products. To gain some understanding of industrial manufacturing processes in the work place. To gain appropriate knowledge required to make choice on future KS4 choices (Design & Technology and Engineering).**<br><br>**Textiles – To develop skills using hand sewing and machine sewing methods to allow them to carry out basic repairs to textiles products/garments at home. To gain an understanding of the industrial manufacturing processes in the work place. To gain an understanding of where textiles materials come from and their impact on the world around us and to have an understanding of different materials and their properties to enable them to make appropriate choices when manufacturing products.** |

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| | **All projects should develop students understanding of careers available in the appropriate sectors relating to Food & Nutrition and Design and Technology.** |
| Academy values: | **Ambitious – In all projects students are encouraged to strive to produce products/dishes which are of the highest quality and push their creativity and skills.**<br>**Brave – Students are required to be brave when undertaking tasks which require the use of new and interesting tools, equipment and processes in the workshop and food room. Students are encouraged to try new foods which they have never tried before.**<br>**Kind – Students are required to work in groups and help each other in most projects. The end user of the product being designed is always considered and the impact on the wider community has to be taken into account.** |

Units of Study:

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| Unit/Topic 1 | Content: | **CAD (Torch Design and manufacture)**<br>This builds upon the drawing skills learnt in Y7 and the design process.<br>It introduces the independent use of CAD software and use of CAM. | NC Content: | **Design**<br>1,2,3,5 & introduction to 4<br>**Make**<br>1 & 2<br>**Evaluate**<br>1,2,3,& 4<br>**Technical knowledge**<br>1 |
| | Key Concepts: | How production techniques in school link to the industrial production of products, how everyday products have gone through the design process to reach the consumer. | Powerful Knowledge: | The ability to use CAD software and use CAM manufacturing techniques. |
| Unit/Topic 2 | Content: | **Electronics – Night Light**<br>Developing further drawing and presentation techniques (2-point perspective). Introduction to soldering circuits.<br>Electronic components and the systems approach to electronics. Practical ability to solder a circuit. | NC Content: | **Design**<br>1,2,3,4 & 5<br>**Make**<br>1 & 2<br>**Evaluate**<br>1,2,3, & 4<br>**Technical knowledge**<br>1 & introduction to 2 |
| | Key Concepts: | How simple electronic circuits function (link to science), how a simple idea can have many different outcomes, how modelling and prototyping influences design solutions | Powerful Knowledge: | Knowledge of how electrical and electronic circuits works |
| Unit/Topic 3 | Content: | **Food**<br>Build upon skills and knowledge learnt in y7.<br>Develop their knowledge of healthy eating and function of ingredients. | NC Content: | **Cooking and nutrition**<br>1,2,3 & 4 |
| | Key Concepts: | How simple ingredients can have different functions in cooking and can drastically alter the outcome of a dish, how a balanced diet can have a dramatic effect on future health | Powerful Knowledge: | Detailed knowledge of the main nutrients in the diet. |
| Unit/Topic 4 | Content: | **Textiles**<br>Development of the basic textiles skills to produce a product which meets a brief. | NC Content: | **Design**<br>1,2,3,4 & 5<br>**Make**<br>1 & 2 |

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| | | | | **<u>Evaluate</u>**<br>1,2,3, & 4<br>**<u>Technical knowledge</u>**<br>1 |
| | Key Concepts: | How similar outcomes can be achieved using different techniques, how textiles is more than fashion designing. | Powerful Knowledge: | Designing to meet a specific target market and using branding |

## Implementation

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| Progression from Year 7: | • The design process and application of ACCESSFMM<br>• An understanding of the environmental impact of a range of materials and ingredients<br>• How to draw accurately in isometric<br>• How to use a range of tools in the workshop and kitchen<br>• What constitutes a healthy and balanced diet<br>• Simple hand stitching techniques<br>• The difference between natural and synthetic fibres |
| Progression to Year 9: | • Proficient in the use of 2D Design software<br>• Understand how to use the laser cutter (some independently)<br>• How to use a range of presentation techniques (isometric, 2 point perspective)<br>• How to solder a circuit<br>• The effects of fats, carbohydrates and proteins in the body<br>• How to use the sewing machine |
| Spaced Interleaving: | Each module is based around the design process and revisits this frequently while focusing on the individual material area. Each topic revisits an aspect of the y7 modules (CAD – plastics theory, Electronics – drawing techniques, Food – healthy diet, Textiles – natural and synthetic fibres). |

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| Student Needs: | SEND: | Learning screens and lesson notes are printed (on appropriate coloured paper) for those students that require them. Dyslexic students are provided with appropriate coloured exercise books.<br>Seating plans take into account student needs, whether that is grouping SEND students to gain support from an LSA or seating students with an appropriate student who can offer support.<br>Where SEND students do not have an LSA in lessons technician support is provided during practical activities. | Context | With a boy heavy cohort the practical nature of the content provides more student engagement.<br>A high proportion of PPG students is catered for by providing students with the skills required to feed themselves and their families with healthy balanced meals which when cooked from raw/fresh ingredients can be more economical.<br>HPA students are provided with the opportunities to stretch and challenge themselves in order to reach their potential. |
| | LPA: | Writing frames and templates are provided for written activities.<br><u>CAD</u> – Template parts provided on 2D Design to be adapted<br><u>Electronics</u> – Casing for the night light can be manufactured from an adapted/developed 2D Design template.<br><u>Food</u> – Recipes are aimed at the lower students with opportunities for more able to adapt and develop recipes<br><u>Textiles</u> – Templates for marking out are provided and the range of embellishments to be included are differentiated by ability. | HPA: | Stretch/Challenge activities are provided in all lessons.<br><u>CAD</u> – The CAD design parts can be designed from scratch and the product is expected to include independently designed shapes and layers of plastic<br><u>Electronics</u> – The design of the finished products is expected to use a wider range of techniques and components. Extended modelling and evaluation of prototypes is expected. Students are expected to go through the iterative process several times to develop their idea.<br><u>Food</u> – Recipes allow for students to adapt and develop the dishes |

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| | | | | Textiles – The range of embellishments allows HPA students to incorporate a wider range of techniques in their finished product. |
| Extracurricular: | Drayton Manor roller coaster design trip.<br>Food - Extra-curricular practical sessions available for 6 weeks in rotation with other KS3 year groups.<br>Textiles - Textiles club available for all KS3 students for a 6 week project. | | | |
| Literacy/Numeracy: | Vocab (tier 2/3): | **Tier 2**<br>Design, Process, Analysis, Evaluate, Hygiene, Environmental, Ingredients, Consumer, Decorative, Audience, Natural.<br>**Tier 3**<br>Aesthetics, Ergonomics, Anthropometric, Function, Manufacture, Perspective, Specification, Annotation, Rendering, Extrude, Electronic, System, Transistor, Capacitor, Solder, Component, Resistor, Contamination, Bacteria, Simmer, Profile, Convection, Conduction, Radiation, Carbohydrates, Protein, Macronutrient, Micronutrient, Kneading, Proving, Pathogen, Applique, Manufacture, Synthetic, Biodegradable, Renewable, Embroidery, Merchandising. | Reading: | Student guide and design brief.<br>Recipe ingredients & instructions.<br>Exit tickets are taken from GCSE papers to develop students understanding of key vocabulary and command words. |
| | Writing: | CAD - Extended writing opportunities are included in product analysis, annotation of designs and evaluations. Example responses are modelled by teachers.<br>Food - Extended writing opportunities are included in sensory analysis tasks and evaluation of dishes.<br>Textiles - Extended writing opportunities are included in product analysis, annotation of designs and evaluations. | Numeracy: | CAD - dimensioning of the product on 2D Design software and modelling of the prototype. Anthropometric data/statistics are collected and analysed.<br><br>Electronics - Dimensioning of prototype and product parts. Calculating resistor values.<br><br>Food – Weighing & measuring and calculating timings. Calculating spread of food poisoning pathogens.<br><br>Textiles - Dimensioning of prototype and product parts. |
| Practice: | Mass: | Currently we follow the academy policy of 2 assessment points during the academic year which cover the knowledge gained during y7 modules and incorporate the new and expanded knowledge gained during the y8 modules.<br>Assessment 1 covers food hygiene, food miles, sensory analysis of foods, properties of woods, hand tools in the workshop, creating design criteria for a designs and communication of these designs<br>Assessment 2 covers production processes used in the workshop (those covered in Y7), quality | Distributed: | Electronics - Exit tickets are used to practice knowledge gained on use of CAM in industry, properties and uses of plastics and smart materials<br>CAD - Exit tickets are used to practice knowledge gained on electronic components (symbols and uses), product evaluation and modelling and prototyping.<br>Food - Exit tickets are used to practice knowledge gained on fats in the diet, food packaging regulations and proteins in the diet.<br>Textiles - Exit tickets are used to practice knowledge gained on using flowcharts as production plans, machine and decorative techniques and specifications. |

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| | | control during manufacture, properties of materials and communication of design ideas for packaging. | | |

# KS3 – Year 9 Year Plan

## Intent

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| Aims: | **Food – To know the benefits of following a balanced/healthy diet and the consequences of not following a healthy diet at various life stages. To develop a range practical skills which can be adapted to prepare nutritious meals and dishes from raw Ingredients. To understand where food comes from to enable students to make informed choices taking into account social, moral, ethical and sustainability issues. To have the knowledge and skills required to be built upon to complete the GCSE Food Preparation and Nutrition course.**<br><br>**Resistant Materials/Product Design – To develop skills using workshop tools which will enable them to complete basic DIY tasks at home in later life. To gain an understanding of where materials come from and their impact on the world around us and to have an understanding of different materials and their properties to enable them to make appropriate choices when manufacturing products. To gain some understanding of industrial manufacturing processes in the work place. To gain appropriate knowledge required to make choice on future KS4 choices (Design & Technology and Engineering).**<br><br>**Textiles – To develop skills using hand sewing and machine sewing methods to allow them to carry out basic repairs to textiles products/garments at home. To gain an understanding of the industrial manufacturing processes in the work place. To gain an understanding of where textiles materials come from and their impact on the world around us and to have an understanding of different materials and their properties to enable them to make appropriate choices when manufacturing products.**<br><br>**All projects should develop students understanding of careers available in the appropriate sectors relating to Food & Nutrition and Design and Technology.** |
| Academy values: | **Ambitious – In all projects students are encouraged to strive to produce products/dishes which are of the highest quality and push their creativity and skills.**<br>**Brave – Students are required to be brave when undertaking tasks which require the use of new and interesting tools, equipment and processes in the workshop and food room. Students are encouraged to try new foods which they have never tried before.**<br>**Kind – Students are required to work in groups and help each other in most projects. The end user of the product being designed is always considered and the impact on the wider community has to be taken into account.** |

Units of Study:

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| Unit/Topic 1 | Content: | **Product Design – USB stick**<br>To build on the knowledge and skills introduced in the y8 CAD (torch) project.<br>Skills in using Solidworks software. Independent use of the laser cutter to model and test designs. | NC Content: | **Design**<br>1,2,3,4 & 5<br>**Make**<br>1 & 2<br>**Evaluate**<br>1,2,3, & 4<br>**Technical knowledge**<br>1 |
| | Key Concepts: | Virtual modelling of prototypes and products, branding of products. | Powerful Knowledge: | Use of 3D CAD software. |
| Unit/Topic 2 | Content: | **Resistant Materials**<br>Introduction to a range of practical skills which build on the skills introduced in Y7.<br>Combining a range of manufacturing processes to design and make independently design product. | NC Content: | **Design**<br>1,2,3,4 & 5<br>**Make**<br>1 & 2<br>**Evaluate** |

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| | | | | 1,2,3, & 4<br>**Technical knowledge**<br>1 |
| | Key Concepts: | How different materials are combined to manufacture products, iterative design in products | Powerful Knowledge: | The knowledge to combine a range of different materials to satisfy a problem |
| Unit/Topic 3 | Content: | **Food**<br>Builds on the knowledge and skills learnt in y7 & 8. Functional properties of ingredients and how they impact on the success of a product. Food choices made by individuals. | NC Content: | **Cooking and nutrition**<br>1,2,3 & 4 |
| | Key Concepts: | How ingredients can be versatile in the properties they display depending how they are used | Powerful Knowledge: | Chemical and functional properties of ingredients when used in cooking |
| Unit/Topic 4 | Content: | **Textiles**<br>Build on and develop skills introduced in the Y8 textiles project.<br>A range of more complex manufacturing skills (hand and machine based). How to design products to meet a particular design style. | NC Content: | **Design**<br>1,2,3,4 & 5<br>**Make**<br>1 & 2<br>**Evaluate**<br>1,2,3, & 4<br>**Technical knowledge**<br>1 |
| | Key Concepts: | Designing does not have to be done from scratch, we can use past designing as an influence | Powerful Knowledge: | Industrial techniques used in the textiles industry. How to create designs using influences from past designers. |

## Implementation

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| Progression from Year 8 | • Proficient in the use of 2D Design software<br>• Understand how to use the laser cutter (some independently)<br>• How to use a range of presentation techniques (isometric, 2 point perspective)<br>• How to solder a circuit<br>• The effects of fats, carbohydrates and proteins in the body<br>• How to use the sewing machine | | | |
| Progression to Year 10: | • A thorough grasp of the design process and how to apply it<br>• An understanding of materials, their properties and environmental impact<br>• An understanding of the industrial processes and their links to processes used in school<br>• What constitutes a balanced diet<br>• Properties of key ingredients | | | |
| Spaced Interleaving: | Each module is based around the design process and revisits this frequently while focusing on the individual material area. Each topic revisits an aspect of the y7&8 modules (Product design – CAD/CAM, Resistant Materials – materials properties, Food – healthy diet and properties of ingredients, Textiles – Hand and machine sewing techniques). | | | |
| Student Needs: | SEND: | Learning screens and lesson notes are printed (on appropriate coloured paper) for those students that require them. Dyslexic students are provided with appropriate coloured exercise books.<br>Seating plans take into account student needs, whether that is grouping SEND students to gain support from an LSA or seating students with an appropriate student who can offer support. | Context | With a boy heavy cohort the practical nature of the content provides more student engagement.<br>A high proportion of PPG students is catered for by providing students with the skills required to feed themselves and their families with healthy balanced meals which when cooked from raw/fresh ingredients can be more economical.<br>HPA students are provided with the opportunities to stretch and challenge themselves in order to reach their potential. |

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| | | Where SEND students do not have an LSA in lessons technician support is provided during practical activities. | | |
| | LPA: | Writing frames and templates are provided for written activities.<br>CAD – Template parts provided on 2D Design to be adapted<br>Resistant Materials– Standard dimensions can be used for the picture frame with instruction sheets to follow to create a standard frame.<br>Food – Recipes are aimed at the lower students with opportunities for more able to adapt and develop recipes<br>Textiles – Templates for marking out are provided and the range of embellishments to be included are differentiated by ability. | HPA: | Stretch/Challenge activities are provided in all lessons.<br>CAD – The CAD design parts can be designed from scratch and the product is expected to include independently designed shapes and layers of plastic<br>Resistant Materials – The design of the finished products is expected to use a wider range of techniques and components. HPA students can independently use the laser cutter to create parts. Students are expected to go through the iterative process several times to develop their idea.<br>Food – Recipes allow for students to adapt and develop the dishes<br>Textiles – The range of embellishments allows HPA students to incorporate a wider range of techniques in their finished product. |
| Extracurricular: | Food - Extra-curricular practical sessions available for 6 weeks in rotation with other KS3 year groups.<br>Textiles - Textiles club available for all KS3 students for a 6 week project. | | | |
| Literacy/Numeracy: | Vocab (tier 2/3): | **Tier 2**<br>Design, Process, Analysis, Evaluate, Industry, Branding, Risk, Analysis, Template, Grain, Renewable, Hygiene, Environmental, Ingredients, Consumer, Decorative, Audience, Natural<br>**Tier 3**<br>Aesthetics, Ergonomics, Anthropometric, Function, Manufacture, Perspective, Specification, Annotation, Rendering, Extrude, Profile, Sustainability, Tenon saw, Coping saw, Perpendicular, Parallel, Coniferous, Deciduous, Veneers, Lamination, Sustainability, Casting, Pewter, Tolerance, Embellishment, Contamination, Bacteria, Simmer, Profile, Convection, Conduction, Radiation, Carbohydrates, Protein, Macronutrient, Micronutrient, Pathogen, Pesticide, Gluten, Coeliac, Coagulation, Applique, Synthetic, Biodegradable, Renewable, Embroidery, Merchandising, | Reading: | Student guide and design brief. Researching a chosen designer and Recipe ingredients & instructions.<br>Exit tickets are taken from GCSE papers to develop students understanding of key vocabulary and command words. |
| | Writing: | Product Design - Extended writing opportunities are included in product analysis, specifications, annotation of designs and evaluations. Example responses are modelled by teachers.<br>Students produce a report on a designer/design style of their choice.<br>Resistant Materials - This is a very practical/hands on based module so there are few opportunities | Numeracy: | Product Design - Numeracy is included in the dimensioning of the product on 2D Design software and modelling of the prototype.<br>Resistant Materials - Accurate measurement and calculating proportions for their product.<br>Food - Weighing & measuring and calculating timings.<br>Textiles - Dimensioning of prototype and product parts. |

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| | | for extended writing apart from in a product analysis and writing specifications.<br>Food - Extended writing opportunities are included in sensory analysis tasks and evaluation of dishes. Example responses are modelled by teachers.<br>Textiles - Extended writing opportunities are included in product analysis, specifications, annotation of designs and evaluations. Example responses are modelled by teachers. | | |
| Practice: | Mass: | Currently we follow the academy policy of 2 assessment points during the academic year which cover the knowledge gained during y7 & 8 modules and incorporate the new and expanded knowledge gained during the y9 modules. | Distributed: | Product Design - Exit tickets are used to practice knowledge gained on annotation of design ideas, branding and industrial plastic forming processes.<br>Resistant Materials - Exit tickets are used to practice knowledge gained on pewter casting, manufacturing tools and product analysis.<br>Food - Exit tickets are used to practice knowledge gained on properties/uses of eggs, packaging & the environment and special dietary needs.<br>Textiles - Exit tickets are used to practice knowledge gained on creating design ideas, use of fabrics and sampling techniques. |

# KS4 – Year 10 Year Plan – Food GCSE

## Intent

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| Aims: | To know the benefits of following a balanced/healthy diet and the consequences of not following a healthy diet at various life stages. To develop a range of practical skills which can be adapted to prepare nutritious meals and dishes from raw Ingredients. To understand where food comes from to enable students to make informed choices taking into account social, moral, ethical and sustainability issues. To have the knowledge and skills required to be built upon to move on to a range of further education courses. |
| Academy values: | Ambitious – In all projects students are encouraged to strive to produce dishes which are of the highest quality and push their creativity and skills.<br>Brave – Students are required to be brave when undertaking tasks which require the use of new and interesting equipment, processes and ingredients in the kitchen. Students are encouraged to try new ideas & skills and use any failures as a learning experience for future attempts. Students are encouraged to try new foods which they have never tried before.<br>Kind – Students are required to work in groups and help each other during investigations. The end user of the food being prepared is always considered and the impact on the wider community has to be taken into account. |

Units of Study:

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| Unit/Topic 1 | Content: | Use of a whole chicken in recipes<br>**Theory**<br>Nutritional content of foods and a balanced diet<br>Level 2 Health and hygiene course to be completed by students. | Spec Content: | **Skills**<br>3.1.1General practical skills<br>3.1.2 Knife skills (meat & fish)<br>3.1.4 Use of the cooker<br>3.1.6 Cooking methods<br>3.1.9 Tenderise and marinate<br>**Theory**<br>3.2.1Macronutrients<br>3.2.3 Nutritional needs and health<br>3.3.1Cooking and heat transfer methods |

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| | Key Concepts: | • What makes a balanced diet and what happens to our body if we don't eat healthily?<br>• How to stay safe and hygienic in a kitchen or food preparation area. | Powerful Knowledge: | Ability to fillet a chicken and use the whole thing in different dishes |
| Unit/Topic 2 | Content: | Pasta and bread making.<br>Use of proteins.<br>**Theory**<br>Food science – proteins<br>Non meat proteins<br>Food choices (Vegetarianism) | Spec Content: | **Skills**<br>3.1.1 General practical skills<br>3.1.2 Knife skills (fruit & veg)<br>3.1.6 Cooking methods<br>3.1.8 Sauce making (reduction)<br>3.1.10 Dough<br>**Theory**<br>3.3.2 Chemical and functional properties of food (proteins)<br>3.4.2 Food safety<br>3.5.1 Factors affecting food choice<br>3.5.2 British and international cuisine |
| | Key Concepts: | • Why ingredients behave in the way they do and why they are key to certain recipes and cooking methods.<br>• Why people choose the foods they do.<br>• How to combine ingredients to produce appetising food.<br>• How to adapt recipes for specific dietary needs. | Powerful Knowledge: | Bread making and pasta making skill from raw ingredients |
| Unit/Topic 3 | Content: | Sauce making.<br>Pastry making.<br>Raising agents<br>**Theory**<br>Food science – carbohydrates<br>Raising agents | Spec Content: | **Skills**<br>3.1.1 General practical skills<br>3.1.8 Sauce making (starch based)<br>3.1.11 Raising agents<br>**Theory**<br>3.3.2 Chemical and functional properties of food (proteins, carbohydrates, fats & raising agents)<br>3.4.2 Principles of food safety<br>3.5.2 British and international cuisine |
| | Key Concepts: | • Why ingredients behave in the way they do and why they are key to certain recipes and cooking methods.<br>• How to combine ingredients to produce appetising food. | Powerful Knowledge: | Sauce and pastry making skills. |
| Unit/Topic 4 | Content: | Use of eggs in cooking.<br>**Theory**<br>Food science – fats and eggs<br>Vitamins and minerals | Spec Content: | **Skills**<br>3.1.1 General practical skills<br>3.1.8 Sauce making (emulsions)<br>3.1.11 Raising agents<br>3.1.12 Setting mixtures<br>**Theory**<br>3.2.2 Micronutrients<br>3.3.2 Chemical and functional properties of food (fats & oils) |

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| | | | | 3.6.1 Environmental impact and sustainability of food (food sources)<br>3.6.2 Food processing and production |
| | Key Concepts: | • Why ingredients behave in the way they do and why they are key to certain recipes and cooking methods.<br>• How to combine ingredients to produce appetising food. | Powerful Knowledge: | Versatility of eggs and other ingredients. |
| Unit/Topic 5 | Content: | International cuisine.<br>Alternative uses of fruit and veg<br>**Theory**<br>Food safety<br>Food provenance | Spec Content: | **Skills**<br>3.1.1 General practical skills<br>3.1.3 Preparing fruit and vegetables<br>3.1.7 Prepare, combine and shape<br>**Theory**<br>3.3.2 Chemical and functional properties of food (fruit & veg)<br>3.4.1 Food spoilage and contamination<br>3.5.2 British and international cuisine<br>3.6.1 Environmental impact and sustainability of food |
| | Key Concepts: | • How to combine ingredients to produce appetising food.<br>• Why people choose the foods they do.<br>• How to adapt recipes for specific dietary needs.<br>• How to stay safe and hygienic in a kitchen or food preparation area. | Powerful Knowledge: | Versatility of fruit and vegetables |
| Unit/Topic 6 | Content: | Practice NEA1 | Spec Content: | Dependent on task title |
| | Key Concepts: | Dependent on task title | Powerful Knowledge: | Investigating a problem and planning how to solve and satisfy the task. |

## Implementation

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| Progression from Year 9: | A general understanding of<br>• Health and hygiene<br>• Balanced diet<br>• Key macro and micronutrients<br>• Functional properties of proteins, carbohydrates and fats<br>• Sustainability in food production<br>• Why people make different food choices (SMES)<br>• Key practical skills for the food room |
| Progression to Year 11: | In depth knowledge of<br>• Chemical and functional properties of proteins, carbohydrates and fats<br>• Nutritional content of food and it's impact of the body<br>• Why people make different food choices in particular dietary needs, religion and culture<br>• How to carry out a food investigation and analyse the results<br>• A wide range of practical skills |
| Spaced Interleaving: | Nutritional content of food is delivered first in Y10 to enable students to apply this knowledge consistently throughout KS4 when planning and evaluating food cooked (Student's complete nutritional analysis of dishes using www.explorefood recipe calculator to create food nutrition labels). Skills developed |

<table>
<tr><td></td><td colspan="4">in analysing food investigations in term 2 (proteins) are repeatedly used and developed throughout term 3 (carbohydrates) and term 4 (fats). Food safety is highlighted during all practicals and is analysed in depth when new high risk ingredients are used. SMES is a common thread throughout the course.</td></tr>
<tr><td rowspan="2">Student Needs:</td><td>SEND:</td><td>Learning screens and lesson notes are printed (on appropriate coloured paper) for those students that require them. Dyslexic students are provided with appropriate coloured exercise books.<br>Seating plans take into account student needs, whether that is grouping SEND students to gain support from an LSA or seating students with an appropriate student who can offer support.<br>Where SEND students do not have an LSA in lessons technician support is provided during practical activities.<br>Key words are highlighted in lesson notes.<br>Practical resources are labelled clearly within the room using dyslexia friendly background colours and fonts. Photo booklet of equipment and names provided.<br>Practical work is demonstrated with chunked demonstrations and tasks where needed.<br>Learning is revisited in sessions and through-out the course to reinforce key concepts.<br>DJB allocated as SEN rep for D&T to disseminate information.</td><td>Context</td><td>Obesity is a major concern in the Tamworth area and this course provides students with the tools to provide themselves and their families with a healthier diet. It also provides students with the knowledge to produce meals which are healthy as well as cost effective which is a benefit to our students who have a more financially challenging background. (During term 1 of Y10 practicals are all based around the starting point of a whole chicken which over a series of lessons is used to produce 3 meals.)<br>The course offers insight into a range of careers based around the food service industry and provides opportunities for students to investigate further education courses further afield than the direct Tamworth area.</td></tr>
<tr><td>LPA:</td><td>• Writing frames and templates are provided for written activities<br>• Appropriately graded modelled examples are provided or work is modelled during session<br>• Recipes are made accessible for all with opportunities for students to develop/extend them to provide challenge<br>• Practical activities are demonstrated with further chunked demonstrations for those that need it.<br>• Technician support is available for students lacking confidence in practical tasks<br>• Assessments are differentiated with graded questions provided<br>• Extended learning mentoring sessions are available after school for those that need extra time/help</td><td>HPA:</td><td>• Practical activities are differentiated according to skill level and level of complexity<br>• Opportunity to develop extend recipes is included<br>• Written instructions are provided for students to attempt practical independently while demonstration continues with less able students<br>• Assessments are differentiated with graded questions provided<br>• Extended learning sessions are available for students to carry out more complex tasks which don't fit in a normal session</td></tr>
<tr><td>Extracurricular:</td><td colspan="4">• Alongside the level 2 health and hygiene qualification students visit the school canteen in small groups to see how it is applied practically.<br>• Outside speaker form vegan society.<br>• Enrolment for UCB Young Bakers Academy and Young Chefs Academy rolled out to be attended for 7 Saturday mornings beginning Feb.<br>• UCB "Have a go day" (Bakery, cookery, food science and hospitality)</td></tr>
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| Literacy/Numeracy: | Vocab (tier 2/3): | **Tier 2**<br>Aesthetics, garnish, convection, conduction, radiation, deficiency, glucose, Marinade, kneading, curdling, vegan, spreading, creaming, vitamin, mineral, enzymes, contamination, ferment, preservatives, biological catalyst, oxidation, bacteria, sterilised, vaccinated, Analysis, Investigate, hypothesis<br><br>**Tier 3**<br>Julienne, brunoise, macedoine, jardinière, filleting, blanch, amino acids, complementation, kwashiorkor, hydrogenation, cholesterol, saccharides, Complementation, denaturation, coagulation, syneresis, gluten, glutenin, gliadin, lacto-vegetarian, ovo-vegetarian, Gelatinisation, amylose, amylopectin, dextrin, dextrinisation, caramelisation, shortening, plasticity, aeration, emulsion, emulsification, hydrophilic, hydrophobic, lecithin, micronutrient, retinol, beta-carotene, antioxidants, fortified, thiamine, riboflavin, folic acid, pathogens, denature, pasteurised, rennet, lactose, lactic acid, curds, whey, perishable, campylobacter, salmonella, listeria. | Reading: | • Exit tickets use exam questions to familiarise students with command words. Students are provided with lesson notes to read through and use to recap subject knowledge.<br>• Recipe methods are provided to follow and understand.<br>• Level 2 Food hygiene certificate course includes reading of extended texts with subject specific vocabulary included.<br>• Preparation reading is provided in preparation for the Vegan society visit.<br>• International cuisine research task requires extended reading.<br>• Research task requires extended reading. |
| | Writing: | Each end of project test includes at least 2 extended writing questions. [Recipe analysis of meals for an elderly person (10.2 Q3), nutritional info on food labels (11.2 Q3.7), Recipe analysis of meals for a 7 year old (10.1 Q6), control measures for sensory testing (11.2 Q3.5), Recipe analysis of meals for an active 25 year old (11.2 Q3), Raising agents (10.2 Q4.4), Creating menus for hospital patients (Spare Q3), Type 2 diabetes (11.2 Q5.2), Sales of organic food (10.2 Q5.1), enzymic browning (11.2 Q3.6)]<br>Students are required to write analyses of recipes and nutritional content of foods.<br>NEA 1 requires students to produce a report of between 1500 & 200 words. This report is set out as a scientific report and includes research, planning, description of investigations, presentation of results and drawing conclusions from these results. | Numeracy: | Weighing, measuring & timings (recipes - Chicken goujons, chicken pies, chicken skewers, pasta Arabiata, bread, Chelsea buns))<br>Nutritional analysis of recipes using appropriate units (grams, milligrams, micrograms) and calculating percentages.<br>Nutritional analysis of recipes comparing protein in standard diet and vegetarian/vegan diet.<br>Experimentation recording and comparing rates of expansion when gas is produced, speed of flow of liquids.<br>Comparison of viscosity, predicting rates and timings in experiments and comparing results.<br>Measuring rates of enzymic browning, calculating bacteria growth over time.<br>Presentation of results using appropriate graphs and charts. |
| Practice: | Mass: | End of term assessment covering all topics from that term<br>• Term 1 - Short answer and multiple-choice questions on a balanced diet | Distributed: | EXIT tickets are included to gauge understanding and develop exam technique in understanding question styles. Each individual theory topic has an end of topic test which is repeated 2 week later to gauge progress. |

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| | | and nutrients in the diet with along answer analysis question on a specific dietary need<br>• Term 2 - Short answer and multiple-choice questions on a chemical and functional properties of proteins with extended writing question on food choices-vegetarians<br>• Term 3 - Short answer and multiple-choice questions on a chemical and functional properties of carbohydrates & raising agents with extended writing on the Chorleywood bread making process<br>• Term 4 - Short answer and multiple-choice questions on a chemical and functional properties of fats & eggs and vitamins and minerals with extended writing question on production of eggs<br>• Term 5 - Short answer and multiple-choice questions on a food safety and international cuisine with a ling answer question on food provenance<br><br>Whole school assessments<br>NOV - Adapted AQA sample paper – Q7 & Q10 removed as not yet covered<br>JUN - Full AQA 2018 paper as all theory content has been covered | | • Term 1 topics - balanced diet, proteins and carbohydrates.<br>• Term 2 topics - functional properties of proteins and food choices<br>• Term 3 topics – functional properties of carbohydrates and raising agents<br>• Term 4 topics – functional properties of fats and vitamins a & minerals in the diet<br>• Term 5 topics – food safety and food provenance |

# KS4 – Year 11 Year Plan – Food GCSE

## Intent

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| Aims: | To know the benefits of following a balanced/healthy diet and the consequences of not following a healthy diet at various life stages. To develop a range of practical skills which can be adapted to prepare nutritious meals and dishes from raw Ingredients. To understand where food comes from to enable students to make informed choices taking into account social, moral, ethical and sustainability issues. To have the knowledge and skills required to be built upon to move on to a range of further education courses. |
| Academy values: | Ambitious – In all projects students are encouraged to strive to produce dishes which are of the highest quality and push their creativity and skills.<br>Brave – Students are required to be brave when undertaking tasks which require the use of new and interesting equipment, processes and ingredients in the kitchen. Students are encouraged to try new ideas & skills and use any failures as a learning experience for future attempts. Students are encouraged to try new foods which they have never tried before.<br>Kind – Students are required to work in groups and help each other during investigations. The end user of the food being prepared is always considered and the impact on the wider community has to be taken into account. |
| Units of Study: | |

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| Unit/Topic 1 | Content: | **NEA 1**<br>Title released 1st September | Spec Content: | 3.3.2 Chemical and functional properties of food<br><br>A01 & A04 |
| | Key Concepts: | Why ingredients behave in the way they do and why they are key to certain recipes and cooking methods. | Powerful Knowledge: | Investigating a problem and planning how to solve and satisfy the task. |
| Unit/Topic 2 | Content: | **NEA 2**<br>Title released 1st November<br>Investigation, research, skills dish 1 | Spec Content: | Dependent on task title<br><br>A01, A02, A03 & A04 |
| | Key Concepts: | • What makes a balanced diet and what happens to our body if we don't eat healthily?<br>• Why people choose the foods they do.<br>• How to combine ingredients to produce appetising food.<br>• How to adapt recipes for specific dietary needs.<br>• How to stay safe and hygienic in a kitchen or food preparation area. | Powerful Knowledge: | Producing dishes to a high standard by overcoming problems as they arise. |
| Unit/Topic 3 | Content: | **Exam preparation**<br>Revision program to cover all theory topics and exam technique | Spec Content: | All theory content revisited. |
| | Key Concepts: | • What makes a balanced diet and what happens to our body if we don't eat healthily?<br>• Why ingredients behave in the way they do and why they are key to certain recipes and cooking methods.<br>• Why people choose the foods they do.<br>• What impact do our food choice have on the environment?<br>• How to combine ingredients to produce appetising food.<br>• How to adapt recipes for specific dietary needs.<br>• How to stay safe and hygienic in a kitchen or food preparation area. | Powerful Knowledge: | |

## Implementation

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| Progression from Year 10: | In depth knowledge of<br>• Chemical and functional properties of proteins, carbohydrates and fats<br>• Nutritional content of food and it's impact of the body<br>• Why people make different food choices in particular dietary needs, religion and culture<br>• How to carry out a food investigation and analyse the results<br>• A wide range of practical skills |
| Progression to Post-16: | In depth knowledge of<br>• Chemical and functional properties of proteins, carbohydrates and fats<br>• Nutritional content of food and it's impact of the body<br>• Why people make different food choices in particular dietary needs, religion and culture<br>• How to carry out a food investigation and analyse the results |

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<tr><td></td><td colspan="4">• A wide range of practical skills</td></tr>
<tr><td>Spaced Interleaving:</td><td colspan="4">Nutritional content of food is delivered first in Y10 to enable students to apply this knowledge consistently throughout KS4 when planning and evaluating food cooked (Student's complete nutritional analysis of dishes using www.explorefood recipe calculator to create food nutrition labels). Skills developed in analysing food investigations in term 2 (proteins) are repeatedly used and developed throughout term 3 (carbohydrates) and term 4 (fats). Food safety is highlighted during all practicals and is analysed in depth when new high risk ingredients are used. SMES is a common thread throughout the course.</td></tr>
<tr><td rowspan="2">Student Needs:</td><td>SEND:</td><td>Learning screens and lesson notes are printed (on appropriate coloured paper) for those students that require them. Dyslexic students are provided with appropriate coloured exercise books.<br>Seating plans take into account student needs, whether that is grouping SEND students to gain support from an LSA or seating students with an appropriate student who can offer support.<br>Where SEND students do not have an LSA in lessons technician support is provided during practical activities.<br>Key words are highlighted in lesson notes.<br>Practical resources are labelled clearly within the room using dyslexia friendly background colours and fonts. Photo booklet of equipment and names provided.<br>Practical work is demonstrated with chunked demonstrations and tasks where needed.<br>Learning is revisited in sessions and through-out the course to reinforce key concepts.<br>DJB allocated as SEN rep for D&T to disseminate information.</td><td>Context</td><td>Obesity is a major concern in the Tamworth area and this course provides students with the tools to provide themselves and their families with a healthier diet. It also provides students with the knowledge to produce meals which are healthy as well as cost effective which is a benefit to our students who have a more financially challenging background. (During term 1 of Y10 practicals are all based around the starting point of a whole chicken which over a series of lessons is used to produce 3 meals.)<br>The course offers insight into a range of careers based around the food service industry and provides opportunities for students to investigate further education courses further afield than the direct Tamworth area.</td></tr>
<tr><td>LPA:</td><td>• Writing frames and templates are provided for written activities<br>• Appropriately graded modelled examples are provided or work is modelled during session<br>• Recipes are made accessible for all with opportunities for students to develop/extend them to provide challenge<br>• Practical activities are demonstrated with further chunked demonstrations for those that need it.<br>• Technician support is available for students lacking confidence in practical tasks<br>• Assessments are differentiated with graded questions provided<br>• Extended learning mentoring sessions are available after school for those that need extra time/help</td><td>HPA:</td><td>• Practical activities are differentiated according to skill level and level of complexity<br>• Opportunity to develop extend recipes is included<br>• Written instructions are provided for students to attempt practical independently while demonstration continues with less able students<br>• Assessments are differentiated with graded questions provided<br>• Extended learning sessions are available for students to carry out more complex tasks which don't fit in a normal session</td></tr>
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| Extracurricular: | • Herb garden to be created in-between A and B wing for students of all year groups to attempt to grow their own ingredients (main focus on KS4 using produce in their NEA 2) | | | |
| Literacy/Numeracy: | Vocab (tier 2/3): | **Tier 2**<br>Aesthetics, garnish, convection, conduction, radiation, deficiency, glucose, Marinade, kneading, curdling, vegan, spreading, creaming, vitamin, mineral, enzymes, contamination, ferment, preservatives, biological catalyst, oxidation, bacteria, sterilised, vaccinated, Analysis, Investigate, hypothesis<br><br>**Tier 3**<br>Julienne, brunoise, macedoine, jardinière, filleting, blanch, amino acids, complementation, kwashiorkor, hydrogenation, cholesterol, saccharides, Complementation, denaturation, coagulation, syneresis, gluten, glutenin, gliadin, lacto-vegetarian, ovo-vegetarian, Gelatinisation, amylose, amylopectin, dextrin, dextrinisation, caramelisation, shortening, plasticity, aeration, emulsion, emulsification, hydrophilic, hydrophobic, lecithin, micronutrient, retinol, beta-carotene, antioxidants, fortified, thiamine, riboflavin, folic acid, pathogens, denature, pasteurised, rennet, lactose, lactic acid, curds, whey, perishable, campylobacter, salmonella, listeria. | Reading: | • Exam revision questions set as homework include understanding of command words and key vocabulary.<br>• Research and analysis tasks in NEA 1 & 2 require in depth reading and selection of appropriate data and information. |
| | Writing: | • NEA 1 requires students to produce a report of between 1500 & 200 words. This report is set out as a scientific report and includes research, planning, description of investigations, presentation of results and drawing conclusions from these results.<br>• NEA 2 requires students to produce an extended report. This includes research, planning, description of investigations, presentation of results and drawing conclusions using sensory analysis.<br>• Exam revision questions require extended writing in at least 3 questions per paper. Techniques for presenting these questions are modelled and practiced. | Numeracy: | • Weighing, measuring & timings.<br>• Nutritional analysis of recipes using appropriate units (grams, milligrams, micrograms) and calculating percentages.<br>• Measuring rates and proportions in experiments for NEA1 dependent on task set by exam board.<br>• Collection and analysis of data for NEA2 research dependent on task set by exam board<br>• Calculating costings of recipes from total raw ingredients down to cost per person |
| Practice: | Mass: | OCT - Whole school assessments (Full AQA Specimen paper).<br>DEC - Whole school assessments (Full AQA June 2019 paper). | Distributed: | • Exam questions set as homework to continue practicing technique and recap key theory knowledge Term 1 Topics – Balanced diet, Eatwell guide, life stages, Term 2 Topics - Chemical and |

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| | | MAR - Whole school assessments (Full AQA June 2018 paper). | | functional properties of ingredients, Term 3 Topics - Raising agents and food production<br>• Frequent use of exam questions in sessions throughout term 4 & 5 to recap Y10 theory knowledge and develop exam technique.<br>• NEA tasks relate to Y10 theory content and are used to recap knowledge through feedback |

# KS4 – Year 10 Year Plan – D&T GCSE

## Intent

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| Aims: | Product Design – To develop skills using workshop tools which will enable them to complete DIY tasks at home in later life and apply these to possible future career options. To gain an understanding of where materials come from and their impact on the world around us and to have an understanding of different materials and their properties to enable them to make appropriate choices when manufacturing products. To gain understanding of industrial manufacturing processes in the work place. To gain appropriate knowledge required to make choices on future further education courses and careers. |
| Academy values: | Ambitious – In all projects students are encouraged to strive to produce products which are of the highest quality and push their creativity and skills.<br>Brave – Students are required to be brave when undertaking tasks which require the use of new and interesting tools, equipment and processes in the workshop. Students are encouraged to try new ideas & skills and use any failures as a learning experience for future attempts. The design process is taught as an iterative process where students can learn from mistakes and adapt designs.<br>Kind – Students are required to work in groups and help each other in most projects. The end user of the product being designed is always considered and the impact on the wider community has to be taken into account. |

Units of Study:

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| Unit/Topic 1 | Content: | Drawing, presentation and communication techniques.<br>Materials properties (Wood) in manufacture of pencil box. | Spec Content: | 3.3.4 Design Strategies<br>3.1.6.1 Material categories (timber)<br>3.1.6.2 Material properties (timber)<br>3.2.5 Using and working with materials<br>3.2.8 Techniques and processes<br>3.2.9 Surface finishes<br>3.3.9 Materials management<br><br>A02 |
| | Key Concepts: | • What is the best way to communicate a design idea for different products?<br>• What are the environmental impacts of using different materials when designing products?<br>• How can our choice of materials influence a product outcome?<br>• Where do our materials come from? | Powerful Knowledge: | Focussing the start of the course on communication techniques allows students to develop skills but also find the most effective communication tools for them.<br>These can then be applied to their future projects and allows them to make choices in their wider life with regards career opportunities and communication techniques. |
| Unit/Topic 2 | Content: | **MP3 Amplifier project**<br>Influential designers.<br>Electronic systems.<br><br>**Theory**<br>Sustainability, product lifecycle, 6 R's | Spec Content: | 3.3.3 The work of others<br>3.1.4 Systems approach to designing<br>3.1.6.1 Material categories (polymers)<br>3.1.6.2 Material properties (Polymers)<br>3.2.8 Techniques and processes (soldering, laser cutter)<br>3.2.1 Selection of materials |

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| | | | | 3.2.3 Ecological and social footprint<br>3.3.4 Design strategies<br>3.2.4 Sources and origins<br>A02, A03, A04 |
| | Key Concepts: | • How product designs are influenced by market demand and user needs?<br>• What are the environmental impacts of using different materials when designing products?<br>• How have everyday products gone through the design process to reach the consumer?<br>• Where do our materials come from? | Powerful Knowledge: | The systems approach applied to electronic systems can be applied to a wide variety of real life situations both physical and theoretical.<br><br>Simple electronic systems principals can be applied to solving household problems with devices and systems. |
| Unit/Topic 3 | Content: | **USB memory stick project**<br>Designing for a client<br>CAD/CAM<br><br>**Theory**<br>Energy production and storage | Spec Content: | 3.3.4 Design Strategies<br>3.3.11 Specialist techniques and processes<br>3.1.2 Energy generation and storage<br><br>A01, A02, A03, A04 |
| | Key Concepts: | • What is the best way to communicate a design idea for different products?<br>• How is energy produced and stored and it's implications on the environment?<br>• How can our choice of materials influence a product outcome? | Powerful Knowledge: | The differences between different energy sources and their benefits to the environment and world around us. |
| Unit/Topic 4 | Content: | **Smart Materials project**<br>Thermo chromatic design task<br><br>**Theory**<br>Scales of production<br>Industry and society | Spec Content: | 3.1.3 Development in new materials<br>3.3.4 Design strategies<br>3.2.7 Scales of production<br>3.1.1 New and emerging technologies<br><br>A01, A02, A03, A04 |
| | Key Concepts: | • What are the environmental impacts of using different materials when designing products?<br>• How have everyday products gone through the design process to reach the consumer?<br>• How can our choice of materials influence a product outcome? | Powerful Knowledge: | Knowledge of smart/modern materials and new and emerging technologies |
| Unit/Topic 5 | Content: | **Mechanical toy project**<br>Designing and manufacturing and mechanical toy<br><br>**Theory**<br>Stresses and forces | Spec Content: | 3.1.5 Mechanical devices<br>3.2.5 Using and working with materials<br>3.3.4 Design strategies<br>3.3.9 Materials management<br>3.2.2 Forces and stresses<br><br>A01, A02, A03, A04 |
| | Key Concepts: | • How do mechanical products work?<br>• How have everyday products gone through the design process to reach the consumer? | Powerful Knowledge: | Knowledge of a wide variety of mechanisms used in many everyday objects. |
| Unit/Topic 6 | Content: | **NEA**<br>Exam board set project to be started. | Spec Content: | 3.3.1 Investigation, primary and secondary data |

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| | | Investigation and research to be completed<br>**<u>Theory</u>**<br>Material sources<br>Paper & board | | 3.3.2 Environmental, social and economic challenge<br>3.3.3 The work of others<br>3.2.4 Sources and origins<br>3.2.6 Stock forms, types and sizes<br>3.1.6.1 Material categories<br><br>A01, A03 |
| | Key Concepts: | • What is the best way to communicate a design idea for different products?<br>• How product designs are influenced by market demand and user needs?<br>• What are the environmental impacts of using different materials when designing products? | Powerful Knowledge: | Investigating a problem and planning how to solve and satisfy the task.<br><br>Knowledge of where some everyday materials originate and are used. |

## Implementation

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| Progression from Year 9: | A general understanding of<br>• Materials, their properties and environmental impact<br>• The industrial processes and their links to processes used in school<br>• Key practical skills required for each material area<br>• CAD software in particular 2D Design<br>• A range of technical drawing and presentation techniques (annotation, isometric drawing, 1 & 2 point perspective and rendering)<br>• Electronic circuits and components<br>• Influential designers and branding<br>• A thorough grasp of the design process and how to apply it. | | | |
| Progression to Year 11: | Detailed knowledge of<br>• Materials, their sources and properties<br>• The environmental impact of designing and manufacturing products<br>• Mathematical principles involved in designing<br>• The systems approach electronic and mechanical systems<br>• How energy is produced and stored<br>• CAD software including 2D Design and Solidworks<br>• CAM machines and their use<br>• Industrial manufacturing processes and principals<br>• Smart/modern materials their properties and uses<br>• At least 2 influential designers from the last 100 years<br>• A wide range of practical skills required in the workshop | | | |
| Spaced Interleaving: | All products are based around the design process so revisit each section regularly and look at different techniques for using the process (wooden box uses isometric sketching to present ideas, electronics product builds on this and uses isometric and CAD designing to model ideas, smart materials product uses alternative sketching techniques and physical modelling etc.).<br>Sustainability & the environment, material properties, user needs and industrial techniques run through all projects and are revisited regularly. | | | |
| Student Needs: | SEND: | Learning screens and lesson notes are printed (on appropriate coloured paper) for those students that require them. Dyslexic students are provided with appropriate coloured exercise books.<br>Seating plans take into account student needs, whether that is grouping SEND students to gain support from an LSA or seating students with an appropriate student who can offer support. | Context | Product Design is often chosen predominantly by boys. To cater for this theory knowledge is built into practical activities as much as possible with the opportunity to use extended writing key terminology developed throughout the course.<br>The course offers insight into a range of careers based around the design industry and provides opportunities for students to investigate a wide range of careers outside their local area.<br>Entrust STEM ambassadors are used to promote the wide range |

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| | | Where SEND students do not have an LSA in lessons technician support is provided during practical activities.<br>Key words are highlighted in lesson notes.<br>Practical resources are labelled clearly within the room using dyslexia friendly background colours and fonts. Photo booklet of equipment and names provided.<br>Practical work is demonstrated with chunked demonstrations and tasks where needed.<br>Learning is revisited in sessions and through-out the course to reinforce key concepts.<br>DJB allocated as SEN rep for D&T to disseminate information. | | of career opportunities available to students with a Product Design qualification. |
| | LPA: | • Writing frames and templates are provided for written activities<br>• Appropriately graded modelled examples are provided or work is modelled during session<br>• Practical outcomes are differentiated by skill level required and taking into account students expected progress.<br>• Practical activities are demonstrated with further chunked demonstrations for those that need it.<br>• Technician support is available for students lacking confidence in practical tasks<br>• Assessments are differentiated with graded questions provided<br>• Extended learning mentoring sessions are available after school for those that need extra time/help | HPA: | • Practical activities are differentiated according to skill level and level of complexity<br>• Opportunity to develop/extend products through extra material resources and equipment is included<br>• Written instructions are provided for students to attempt practical independently while demonstration continues with less able students<br>• Assessments are differentiated with graded questions provided<br>• Extended learning sessions are available for students to carry out more complex tasks which don't fit in a normal session |
| Extracurricular: | • Entrust STEM ambassador visit to promote creativity, investigation and iterative design.<br>• Extra curricula club to manufacture planters for the Academy herb garden. | | | |
| Literacy/Numeracy: | Vocab (tier 2/3): | **Tier 2** Classification, properties, grain, manufactured, density, aesthetics, ergonomics, deforestation, sensor, components, polymer, conductivity, aesthetics, ergonomics, ethical, sustainability, life-cycle, atmospheric, pollution, detrimental, kinetic, hydro-electric, biomass distillation, extraction, refining, industry, enterprise, finite, culture, society, environment, ethics, manufacturing, function, conductive, enhanced, resistant, lever, motion, pulley, aesthetics, ergonomics, magnitude, reinforced, enhanced, flexible, corrugated, duplex, properties, alloys, aesthetics, ergonomics. | Reading: | Exit tickets use exam questions to familiarise students with command words. Research materials and use of Day dream education pocket posters requires student reading to pick up key words and knowledge with end of topic testing to gauge understanding.<br>Daydream pocket posters to be covered<br>**Term 1** – communication of ideas, material properties, natural timbers, manufactured boards, selecting materials, Timbers [sources and origins, stock forms types and sizes, properties, surface finishes & treatments]<br>**Term 2** - Electronic systems, polymers, polymers [sources and origins, stock forms types and sizes, properties, surface finishes & treatments], Electronic systems [properties, stock forms types & |

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| | | **Tier 3** Deciduous, coniferous, strength, hardness, toughness, malleability, ductility, elasticity, microcontroller, solder, flux, fusibility, prototype, obsolescence, nanomaterials, graphene, thermos-chromatic, photo-chromatic, polymorph, encapsulated, linkage, tension, compression, torsion, shear, lamination, webbing, interfacing, ferrous, strength, hardness, toughness, malleability, ductility, elasticity, annealing, perforation | | sizes, shaping & forming and surface treatments & finishes], environmental, social and economic challenges<br>**Term 3** - Energy generation & storage, prototype development<br>**Term 4** - New & emerging technologies, developments in new materials, ecological & social issues, scales of production<br>**Term 5** - mechanisms, gears, cams & followers, pulleys & belts, levers & linkages, forces & stresses<br>**Term 6** - Design strategies, the work of others, collecting & analysing data, design & manufacturing specifications |
| | Writing: | Each end of project test includes at least 2 extended writing questions<br>**Term 1** Why pine is a suitable material for manufacture of wardrobes (11.2 Q17), explaining the process of processing a tree into usable boards(11.2 Q14)<br>**Term 2** Evaluating how certain materials can be seen as a more ethical choice (11.2 Q18), explanation of the 6 R's (11.3 Q15)<br>**Term 3** evaluation of a specific product (11.2 Q19) and adapting it to suit a specific market (11.2 Q22)<br>**Term 4** Describing manufacturing processes used to produce a specific product (11.2 Q16), evaluating the use of different scales of production (Own)<br>**Term 5** Describing methods of strengthening or reinforcing materials (11.2 Q15), the purpose of and methods of quality control (11.1 Q18)<br>**Term 6** analysis and explanation of a data set (11.2 Q21), importance of collaboration (11.1 Q23)<br>Annotation of design ideas using ACCESSFMM to fully communicate design proposals.<br>Extended research task on influential designers to include facts, analysis of their work, personal opinion and conclusions.<br>Detailed descriptive writing required to define each of the scales of production and their differences.<br>NEA section A requires extended writing on presenting research findings, section b requires a design brief and specification to be produced. | Numeracy: | **Unit 1** Calculation of material costs, surface area and volume. Efficient material use, pattern spacing, nesting and minimising waste.<br>**Unit 2** Analysing responses to user questionnaires/surveys. Presentation of survey responses using percentages.<br>Use of percentile ranges in anthropometric and ergonomic data.<br>**Unit 3** Scaling of drawings and working to a datum.<br>**Unit 4** Calculation of material costs<br>**Unit 5** Arithmetic and numerical computation e.g. use ratios. Use angular measures in degrees. Changing the magnitude and direction of forces.<br>**Unit 6** Working to tolerances.<br>Analysing responses to user questionnaires/surveys. Presentation of survey responses using percentages. |
| Practice: | Mass: | Whole school assessments<br>DEC - Adapted AQA sample paper 1 – Section B Specialist technical principles removed as not yet covered<br>JUN - Full AQA sample paper 2 as all theory content has been covered.<br>End of term assessment covering all topics from that term | Distributed: | EXIT tickets are included to gauge understanding and develop exam technique in understanding question styles.<br>Each individual theory topic has an end of topic test which is repeated 2 week later to gauge progress.<br>**Term 1 topics** –Wood material categories & properties and presentation techniques.<br>**Term 2 topics** Electronic systems & circuit symbols, product lifecycles and the 6 R's |

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| | | **Term 1** Short answer and multiple choice questions on wood material categories & properties and application questions on presentation techniques<br>**Term 2** Short answer and multiple choice questions on electronic systems & components and the 6 R's, long answer analysis questions of product life cycles.<br>**Term 3** Short answer and multiple questions on Energy production & Storage and long answer evaluation question on use of CAD/CAM in industry<br>**Term 4** Short answer and multiple choice questions on smart materials, long answer comparison question on scales of production and evaluation question on designing for industry and society<br>**Term 5** Short answer and multiple choice questions on mechanical systems and long calculation questions on gear ratios and mechanical systems<br>**Term 6** Short answer and multiple choice questions on materials sources and paper & boards | | **Term 3 topics** Energy production & storage and use of CAD/CAM in industry<br>**Term 4 topics** smart materials & their properties, scales of production and designing for industry and society<br>**Term 5 topics** mechanical systems, stresses and forces<br>**Term 6 topics** Material sources and papers & boards |

# KS3 – Year 11 Year Plan – D&T GCSE

## Intent

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| Aims: | Product Design – To develop skills using workshop tools which will enable them to complete DIY tasks at home in later life and apply these to possible future career options. To gain an understanding of where materials come from and their impact on the world around us and to have an understanding of different materials and their properties to enable them to make appropriate choices when manufacturing products. To gain understanding of industrial manufacturing processes in the work place. To gain appropriate knowledge required to make choices on future further education courses and careers. |
| Academy values: | Ambitious – In all projects students are encouraged to strive to produce products which are of the highest quality and push their creativity and skills.<br>Brave – Students are required to be brave when undertaking tasks which require the use of new and interesting tools, equipment and processes in the workshop. Students are encouraged to try new ideas & skills and use any failures as a learning experience for future attempts. The design process is taught as an iterative process where students can learn from mistakes and adapt designs.<br>Kind – Students are required to work in groups and help each other in most projects. The end user of the product being designed is always considered and the impact on the wider community has to be taken into account. |

Units of Study:

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| Unit/Topic 1 | Content: | **NEA**<br>Creating design ideas, development (models and CAD) | Spec Content: | 3.3.4 Design strategies<br>3.3.5 Communication of ideas<br>3.3.6 Prototype development<br>3.3.7 Selection of materials and components<br>3.3.8 Tolerances<br><br>A03, A04 |

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| | Key Concepts: | • What is the best way to communicate a design idea for different products?<br>• How product designs are influenced by market demand and user needs?<br>• What are the environmental impacts of using different materials when designing products? | Powerful Knowledge: | Creating ideas and developing them to find an appropriate solutions which satisfies user's needs. |
| Unit/Topic 2 | Content: | **NEA**<br>Product manufacture | Spec Content: | 3.3.9 Materials Management<br>3.3.10 Specialist tools and equipment<br>3.3.11 Specialist techniques and processes<br><br>A02, A04 |
| | Key Concepts: | • How can our choice of materials influence a product outcome?<br>• Where do our materials come from? | Powerful Knowledge: | Manufacturing a product to a high standard by overcoming problems as they arise. |
| Unit/Topic 3 | Content: | **NEA**<br>Product testing and evaluation | Spec Content: | 3.1.1 Critical evaluation informing design decisions<br><br>A03 |
| | Key Concepts: | • How product designs are influenced by market demand and user needs? | Powerful Knowledge: | Making judgements about their own products and using feedback from others. |
| Unit/Topic 4 | Content: | **Exam preparation**<br>Revision program to cover all theory topics and exam technique | Spec Content: | All theory content revisited |
| | Key Concepts: | • What is the best way to communicate a design idea for different products?<br>• How product designs are influenced by market demand and user needs?<br>• What are the environmental impacts of using different materials when designing products?<br>• How have everyday products gone through the design process to reach the consumer?<br>• How is energy produced and stored and its implications on the environment?<br>• How can our choice of materials influence a product outcome?<br>• How do mechanical products work?<br>• Where do our materials come from? | Powerful Knowledge: | |

## Implementation

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| Progression from Year 10: | Detailed knowledge of<br>• Materials, their sources and properties<br>• The environmental impact of designing and manufacturing products<br>• Mathematical principles involved in designing<br>• The systems approach electronic and mechanical systems<br>• How energy is produced and stored<br>• CAD software including 2D Design and Solidworks<br>• CAM machines and their use |

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<tr><td></td><td colspan="4">• Industrial manufacturing processes and principals<br>• Smart/modern materials their properties and uses<br>• At least 2 influential designers from the last 100 years<br>• A wide range of practical skills required in the workshop</td></tr>
<tr><td>Progression to Post-16:</td><td colspan="4">In depth knowledge of<br>• Materials, their sources and properties<br>• The environmental impact of designing and manufacturing products<br>• Mathematical principles involved in designing<br>• The systems approach electronic and mechanical systems<br>• How energy is produced and stored<br>• CAD software including 2D Design and Solidworks<br>• CAM machines and their use<br>• Industrial manufacturing processes and principals<br>• Smart/modern materials their properties and uses<br>• At least 2 influential designers from the last 100 years<br>• A wide range of practical skills required in the workshop</td></tr>
<tr><td>Spaced Interleaving:</td><td colspan="4">The start of y11 is very much focussed on the NEA task which revisits many of the topics covered in Y10 depending on the task set and the route the students decide to take in their designing. Exam questions homework is set to cover all topics covered in Y10 with topics timed to focus on relevant sections of the NEA task.</td></tr>
<tr><td rowspan="2">Student Needs:</td><td>SEND:</td><td>Learning screens and lesson notes are printed (on appropriate coloured paper) for those students that require them. Dyslexic students are provided with appropriate coloured exercise books.<br>Seating plans take into account student needs, whether that is grouping SEND students to gain support from an LSA or seating students with an appropriate student who can offer support.<br>Where SEND students do not have an LSA in lessons technician support is provided during practical activities.<br>Key words are highlighted in lesson notes.<br>Practical resources are labelled clearly within the room using dyslexia friendly background colours and fonts. Photo booklet of equipment and names provided.<br>Practical work is demonstrated with chunked demonstrations and tasks where needed.<br>Learning is revisited in sessions and through-out the course to reinforce key concepts.<br>DJB allocated as SEN rep for D&T to disseminate information.</td><td>Context</td><td>Product Design is often chosen predominantly by boys. To cater for this theory knowledge is built into practical activities as much as possible with the opportunity to use extended writing key terminology developed throughout the course.<br>The course offers insight into a range of careers based around the design industry and provides opportunities for students to investigate a wide range of careers outside their local area.<br>Entrust STEM ambassadors are used to promote the wide range of career opportunities available to students with a Product Design qualification.</td></tr>
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<tr><td>Extracurricular:</td><td colspan="4">• Entrust STEM ambassador visit to act as client and give feedback on design ideas.</td></tr>
<tr><td rowspan="2">Literacy/Numeracy:</td><td>Vocab (tier 2/3):</td><td>Tier 2 Analysis, Investigate, aesthetics<br>Tier 3 Dependent on NEA task set and can include all vocabulary from Y10</td><td>Reading:</td><td>Exam revision questions set as homework include understanding of command words and key vocabulary.<br>Term 1 Topics – Material properties, timber and it's sources, manufactured boards<br>Term 2 Topics – electronic systems, polymers and their sources, environmental & social challenges<br>Term 3 Topics – energy production and storage, mathematical based questions<br>Term 4 Topics – new and emerging technologies & materials, scales of production<br>Term 5 Topics – mechanical systems</td></tr>
<tr><td>Writing:</td><td>NEA section C requires extended writing on presenting research findings, annotation of ideas, evaluation of designs.<br>NEA section D requires extended writing on development of ideas, evaluation and analysis of models.<br>NEA Section F requires extended writing on presenting research findings, annotation of ideas, analysis of feedback and presenting evaluations.<br>Exam revision questions require extended writing in at least 3 questions per paper. Techniques for presenting these questions are modelled and practiced.</td><td>Numeracy:</td><td>• Scaling of drawings and working to a datum.<br>• Calculation of material costs, surface area and volume. Efficient material use, pattern spacing, nesting and minimising waste.<br>• Analysing responses to user questionnaires/surveys. Presentation of survey responses using percentages.</td></tr>
<tr><td>Practice:</td><td>Mass:</td><td>OCT - Whole school assessments (Full AQA Specimen paper).<br>DEC - Whole school assessments (Full AQA June 2019 paper).<br>MAR - Whole school assessments (Full AQA June 2018 paper).</td><td>Distributed:</td><td>Exam questions set as homework to continue practicing technique and recap key theory knowledge<br>Homework topics to tie in with NEA section being covered<br>Term 1 The work of others, presentation techniques, analysis of existing products<br>Term 2 Properties of materials, calculating material quantities and nesting parts, production techniques and scales of production<br>Term 3 Analysis and evaluation of products, environmental impact & sustainable design, product life cycles</td></tr>
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| | | | | NEA tasks relate to Y10 theory content and are used to recap knowledge through feedback. |

# 5 Year Curriculum Week Plan

## KS3 - Year 7

| | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 |
|---|---|---|---|---|---|---|---|
| **Autumn Term 1** | **Introductory module**<br>What is the design process?<br>Analysis of the task | **Introductory module**<br>Creation of an appropriate mood board | **Introductory module**<br>Analysis of existing products using ACCESSFMM | **Introductory module**<br>Writing a specification | **Introductory module**<br>Designing product logos | **Introductory module**<br>Introduction to isometric drawing | **Introductory module**<br>Packaging Design ideas using isometric drawing.<br>Introduction to annotation techniques. |
| **Autumn Term 2** | **Introductory module**<br>Presentation of final design for packaging applying all presentation/communication techniques learnt. | **Introductory module**<br>Plastics theory. Sources, processing, properties and environmental impact. | **Introductory module**<br>The vacuum forming process. | **Introductory module**<br>Making – manufacture of chocolate mould | **Introductory module**<br>Making – manufacture of packaging | **Introductory module**<br>Creating chocolate lollipops using moulds.<br>Health, safety & hygiene in the food room. | **Introductory module**<br>Evaluation of finished product – revisiting ACCESSFMM and specification. |
| **Spring Term 1** | **Introduction to Resistant Materials (wooden box)**<br>Health and safety in the workshop | **Introduction to Resistant Materials (wooden box)**<br>Product analysis applying ACCESSFMM | **Introduction to Resistant Materials (wooden box)**<br>Practical – practice finger joints marking out and cutting | **Introduction to Resistant Materials (wooden box)**<br>Practical – Marking out and cutting finger joints for box | **Introduction to Resistant Materials (wooden box)**<br>Practical – completion of cutting finger joints | **Introduction to Resistant Materials (wooden box)**<br>Practical – finishing techniques to adjust joints and gluing of joints | **Introduction to Resistant Materials (wooden box)**<br>Practical – finishing techniques (filing, filling and belt sander) |
| **Spring Term 2** | **Introduction to Resistant Materials (wooden box)**<br>Practical – Application of standard components (attaching lid using hinges and clasp) | **Introduction to Resistant Materials (wooden box)**<br>Practical – Finishing techniques (applying wax or varnish) | **Introduction to Food and hygiene**<br>Health and hygiene in the food room | **Introduction to Food and hygiene**<br>Sensory analysis of food – introduction to sensory words and application using example foods. | **Introduction to Food and hygiene**<br>Practical – Preparation of soup. Skills – use of peelers, knives and hob. | **Introduction to Food and hygiene**<br>Practical evaluation and application of sensory testing. | **Introduction to Food and hygiene**<br>Heat transfer methods when cooking. Hob, Grill and oven. |
| **Summer Term 1** | **Introduction to Food and hygiene**<br>Practical – crumble. Revisiting peeling and chopping skills. Introducing rubbing in method. | **Introduction to Food and hygiene**<br>Healthy eating guidelines – introducing Eatwell Guide | **Introduction to Food and hygiene**<br>Thickening agents – gelatinisation of starches | **Introduction to Food and hygiene**<br>Practical – roux sauce using gelatinisation | **Introduction to Textiles (decorative wall hanging**<br>What is textiles design?<br>Task analysis. | **Introduction to Textiles (decorative wall hanging**<br>Product analysis applying ACCESSFMM | **Introduction to Textiles (decorative wall hanging**<br>Practical –Tie dying fabric |
| **Summer Term 2** | **Introduction to Textiles (decorative wall hanging**<br>Practical sampling – applique | **Introduction to Textiles (decorative wall hanging** | **Introduction to Textiles (decorative wall hanging** | **Introduction to Textiles (decorative wall hanging** | **End of year assessments** | **End of year assessments** | **Introduction to Textiles (decorative wall hanging** |

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| | | Practical sampling – hand embroidery | Presentation of final design for wall hanging applying sampling techniques in design and annotation | Product manufacture | | | Product manufacture |

# KS3 - Year 8

| | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 |
|---|---|---|---|---|---|---|---|
| **Autumn Term 1** | **CAD (Torch Design and manufacture)** Design Brief and task analysis – revisiting application of the design process | **CAD (Torch Design and manufacture)** Product analysis – revisiting application of ACCESSFMM | **CAD (Torch Design and manufacture)** Writing a specification using ACCESSFMM | **CAD (Torch Design and manufacture)** Introduction to smart materials and their uses | **CAD (Torch Design and manufacture)** Use of anthropometric data to design ergonomic products | **CAD (Torch Design and manufacture)** Creating design ideas following a theme | **CAD (Torch Design and manufacture)** Use of CAD (2D design) to create product parts from design ideas (parts to be manufactured by technician) |
| **Autumn Term 2** | **CAD (Torch Design and manufacture)** Use of CAD (Solidworks) to create 3D model parts. Demonstration of laser cutter manufacturing product parts | **CAD (Torch Design and manufacture)** Use of CAD to assemble product parts in a virtual model. | **CAD (Torch Design and manufacture)** Manufacture of torch – assembling laser cut components. | **Electronics – Night Light** Design Brief and task analysis – revisiting application of the design process | **Electronics – Night Light** Gathering user research using questionnaires. | **Electronics – Night Light** Writing a specification using ACCESSFMM | **Electronics – Night Light** Practical – soldering a circuit |
| **Spring Term 1** | **Electronics – Night Light** Practical – soldering a circuit | **Electronics – Night Light** Creating design ideas to meet research findings and specification | **Electronics – Night Light** Practical – manufacture of product casing using vacuum forming | **Electronics – Night Light** Modelling design ideas | **Electronics – Night Light** Practical – product manufacture using laser cutter | **Electronics – Night Light** Practical – Product manufacture (combining components) | **Food** Nutrition – Carbohydrates and their function in the body – positives and negatives |
| **Spring Term 2** | **Food** Function of ingredients – raising agents | **Food** Practical – Using raising agents - pizza | **Food** Nutrition – Proteins and their function in the body – positives and negatives | **Food** Health and Hygiene – Food poisoning, its causes and precautions. | **Food** Practical – safe preparation & cooking of meat – sausage plait | **Food** Nutrition – Fats and their function in the body – positives and negatives | **Food** Nutrition – Vitamins and their function in the body – positives and negatives |
| **Summer Term 1** | **Food** Practical – Using fats in the creaming method – simple sponge cakes | **Food** Food choices – Food packaging and labelling | **Textiles** Creating a mood board of existing monster textiles toys. | **Textiles** Product analysis – revisiting application of ACCESSFMM | **Textiles** Practical – sampling – developing applique techniques | **Textiles** Practical – sampling – use of sewing machines | **Textiles** Properties of fabrics – natural and synthetic fibres |
| **Summer Term 2** | **Textiles** Creating design ideas to meet research | **Textiles** | **Textiles** | **Textiles** | **End of year assessments** | **End of year assessments** | **Textiles** Practical – stuffing toy and finishing details |

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| | findings and specification | Development of ideas applying techniques sampled | Practical – cutting and shaping component parts | Practical – application of detail and embellishments | | | |

# KS3 - Year 9

| | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 |
|---|---|---|---|---|---|---|---|
| **Autumn Term 1** | **Food**<br>Food choice – SMES in food production – food miles & Fairtrade | **Food**<br>Function of ingredients – wheat flour | **Food**<br>Function of ingredients – eggs | **Food**<br>Practical – shortening process to make short crust pastry for Cornish pasties | **Food**<br>Food choice – dietary requirements at different life stages | **Food**<br>Practical – safe preparation of chicken – curry or stir fry | **Food**<br>Food production – scales of production |
| **Autumn Term 2** | **Food**<br>Cuisine – Master chef challenge research | **Food**<br>Planning – Master chef planning for practical | **Food**<br>Practical – preparing Master chef dishes | **Product Design**<br>Design Brief and task analysis – revisiting application of the design process | **Product Design**<br>Creating a mood board of existing and inspiring ideas for USB memory sticks | **Product Design**<br>Influential designers research task | **Product Design**<br>Creating design ideas – introduction to 2 point perspective drawing |
| **Spring Term 1** | Assessment window | Assessment window | **Product Design**<br>CAD – design of component parts on 2D Design to be manufactured on laser cutter | **Product Design**<br>CAD – development of 3D CAD skills using Solidworks and complex drawing tools | **Product Design**<br>CAD - development of 3D CAD skills using Solidworks to create engineering drawings | **Product Design**<br>Product manufacture - finishing parts | **Product Design**<br>Product manufacture – Product assembly |
| **Spring Term 2** | **Product Design**<br>Product Evaluation re-visiting ACCESSFMM and using user feedback | **Resistant Materials**<br>Introduction to metals – pewter casting demo and students design moulds | **Resistant Materials**<br>Practical – Pewter casting | **Resistant Materials**<br>Colour theory in designing – Social, moral and ethical considerations | **Resistant Materials**<br>Group mood board creation using given colour | **Resistant Materials**<br>Creating design ideas for a group product range | **Resistant Materials**<br>Practical – Dimensioning and ordering materials |
| **Summer Term 1** | **Resistant Materials**<br>Practical – marking out and cutting/shaping parts | **Resistant Materials**<br>Practical – Manufacture and combining product parts | **Resistant Materials**<br>Practical – applying finishes and embellishments | **Resistant Materials**<br>Product evaluation and dragons den presentation of group product range | **Textiles**<br>Design Brief and task analysis – revisiting application of the design process | **Textiles**<br>Product analysis – revisiting application of ACCESSFMM | **Textiles**<br>Sampling – Revisiting Y7 & 8 sampling techniques and students demonstrating past learning |
| **Summer Term 2** | **Textiles**<br>Designing cushion covers to meet a specific design style (Pop Art) | **Textiles**<br>Properties of materials focusing on construction of fabrics and further developing knowledge of natural and synthetic fibres | **Textiles**<br>Practical – preparing and ordering materials | **Textiles**<br>Practical – cutting shaping parts using patterns and templates | **Textiles**<br>Practical – teacher demo on creating seams | **Textiles**<br>Practical – application of embellishments using sampling techniques | **Textiles**<br>Practical – Completion of product – using sewing machines to create neat/invisible seams |

# KS4 - Year 10 – Food GCSE

| | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 |
|---|---|---|---|---|---|---|---|
| **Autumn Term 1** | **Balanced diet**<br>Government recommendations, Eatwell guide, DRV's | **Proteins (nutrition)**<br>HBV & LBV.<br>**Heat transfer**<br>Convection, conduction, radiation | **Knife skills**<br>Practical - Filleting chicken<br>Practical – Chicken goujons | **Carbohydrates (nutrition)**<br>Starch, sugars & Fibre | **Proteins (properties)**<br>Denaturation, coagulation, shortening | **Shortening**<br>Practical – shortcrust pastry – chicken pies | **Cooking methods**<br>Radiation using grill<br>Practical – chicken skewers |
| **Autumn Term 2** | **Protein (properties)**<br>Gluten formation | **Protein (properties)**<br>Practical – pasta making<br>Sauce making – reduction method (Arabiata) | **Raising agents**<br>Introduction to chemical, mechanical & biological.<br>Main focus on Biological | **Food safety**<br>Preparation of meat proteins.<br>Cross contamination. | **Protein (properties)**<br>Practical – bread making – shaping and finishing techniques | **Food choice**<br>Vegetarianism – protein complementation. | **Food choice**<br>Vegetarianism<br>Practical – planning/adapting meals for vegetarians/vegans.<br>Knife skills – preparation of vegetables |
| **Spring Term 1** | **Raising agents**<br>Pastry making using steam as raising agent<br>Practical – choux pastry | **Raising agents**<br>Cake making using chemical raising agents. | **Raising agents**<br>Mechanical raising agents – volumising<br>Practical – meringues | **Sauce making**<br>Gelatinisation in roux sauce method<br>Practical – roux sauce | **Carbohydrates (properties)**<br>Caramelisation and dextrinisation | **Food choices**<br>British cuisine – how & why cuisines develop in different countries | **Food choices**<br>Planning and preparing dishes from Great Britian |
| **Spring Term 2** | **Use of eggs in cooking**<br>Coagulation of egg proteins to thicken sauces and set mixtures | **Use of eggs in cooking**<br>Revisit mechanical raising agents and the connection of denaturation and coagulation of egg proteins in roulades | **Use of eggs in cooking**<br>Production of eggs – SMES issues around egg production | **Fats (nutrition)**<br>Saturated, unsaturated, hydrogenation.<br>Health implications. | **Fats (properties)**<br>Practical – emulsification (mayonnaise) | **Vitamins (nutrition)**<br>Water soluble, fat soluble and the effects on health | **Minerals (nutrition)**<br>Health impacts of minerals in the diet and their sources. |
| **Summer Term 1** | **Fruit and vegetables**<br>Chemical and functional properties.<br>Thickening, enzymic browning, | **Fruit and vegetables**<br>Practical – revisiting pastry making and shortening method – apple pie (avoiding enzymic browning) | **Food provenance**<br>SMES – Food miles, Fairtrade, GM foods | **Food provenance**<br>Organic foods | **Food safety**<br>Additives and preservatives.<br>Pasteurisation, sterilisation. | **International cuisine**<br>International cuisine – how & why cuisines develop in different countries<br>Spain and China | **International cuisine**<br>International cuisine – how & why cuisines develop in different countries<br>India and Japan |
| **Summer Term 2** | **Practice NEA1**<br>Investigating the task and carrying out research. Planning experiments and investigations | **Practice NEA1**<br>Experiment 1 – practical investigation and analysis | **Assessment window**<br>Revision sessions | **Assessment window**<br>Revision sessions | **Practice NEA1**<br>Experiment 2 – practical investigation and analysis | **Practice NEA1**<br>Experiment 3 – practical investigation and analysis | **Practice NEA1**<br>Analysis of findings and conclusion |

# KS4 - Year 11- Food GCSE

| | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 |
|---|---|---|---|---|---|---|---|
| **Autumn Term 1** | **NEA1**<br>Investigating the task and carrying out research | **NEA1**<br>Planning experiments and investigations | **NEA1**<br>Experiment 1 – practical investigation and analysis | **NEA1**<br>Experiment 2 – practical investigation and analysis | **NEA1**<br>Experiment 3 – practical investigation and analysis | **NEA1**<br>Analysis of findings and conclusion | **NEA1**<br>Review and update NEA 1 |
| **Autumn Term 2** | **NEA 2**<br>Initial investigation of the task. Creating a research plan | **NEA 2**<br>Detailed research into the problem set | **NEA 2**<br>Selection of possible dishes and making choices of 3 skills dishes to be carried out. | **Assessment window**<br>Revision sessions | **Assessment window**<br>Revision session | **NEA 2**<br>Planning skills dish 1 and nutritional analysis (adapting recipe if necessary) | **NEA 2**<br>Practical - skills dish 1 followed by analysis |
| **Spring Term 1** | **NEA 2**<br>Planning skills dish 2 and nutritional analysis (adapting recipe if necessary) | **NEA 2**<br>Practical - skills dish 2 followed by analysis | **NEA 2**<br>Planning skills dish 3 and nutritional analysis (adapting recipe if necessary) | **NEA 2**<br>Practical - skills dish 3 followed by analysis | **NEA 2**<br>Planning exam dishes | **NEA 2**<br>Practical exam | **NEA 2**<br>Exam dishes write up |
| **Spring Term 2** | **Mock exams**<br>Revision sessions | **Mock exams**<br>Revision sessions | **Mock exams**<br>Revision sessions | **Revision programme**<br>Balanced diet and nutrition (macronutrients) | **Revision programme**<br>Balanced diet and nutrition (macronutrients)<br>Exam technique 12 mark nutrition analysis question | **Revision programme**<br>Food science - Chemical and functional properties of ingredients (proteins) | **Revision programme**<br>Food science - Chemical and functional properties of ingredients (carbohydrates) |
| **Summer Term 1** | **Revision programme**<br>Food science - Chemical and functional properties of ingredients (fats) | **Revision programme**<br>Balanced diet and nutrition (micronutrients) | **Revision programme**<br>SMES – GM, Organic, food miles, Fairtrade.<br>Exam technique 8/10 mark evaluation questions | **Revision programme**<br>Heat transfer and cooking techniques | **Revision programme**<br>Food spoilage and how to avoid it. | **Revision programme**<br>Food choices (medical, religious, moral, social) | **Revision programme**<br>British and international cuisine. |
| **Summer Term 2** | | | | | | | |

# KS4 - Year 10 – D&T GCSE

| | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 |
|---|---|---|---|---|---|---|---|
| **Autumn Term 1** | **Communication techniques**<br>Rendering techniques and shading | **Communication techniques**<br>Isometric drawing and crating | **Communication techniques**<br>One point and two point perspective drawing | **Materials properties wood**<br>Softwood, hardwood and manufactured boards. Sources, processing and | **Wooden box manufacture**<br>Manufacturing processes industrial and one off. | **Wooden box manufacture**<br>Fixing methods – permanent and temporary. | **Wooden box manufacture**<br>Finishing techniques on wooden products |

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| | | | | environmental impact | Practical – marking cutting & finishing finger joints | Practical – joining box and base | Practical – waxing box, creating and fixing lid mechanism |
| **Autumn Term 2** | **Electronics project**<br>Influential designers research and analysis of chosen designer | **Electronics project**<br>Electronics theory – components, systems approach | **Electronics project**<br>Practical – soldering circuits<br>Sustainability – 6R's | **Electronics project**<br>Designing applying techniques learnt in term 1. | **Electronics project**<br>CAD – 2D design of casing parts to be manufactured in laser cutter.<br>Sustainability – Life cycle assessment | **Electronics project**<br>Component part manufacture using laser cutter.<br>Material properties - polymers | **Electronics project**<br>Practical – assembly of final product |
| **Spring Term 1** | **USB memory stick project**<br>Initial investigation into clients' needs using primary research methods | **USB memory stick project**<br>Designing applying techniques learnt in term 1 | **USB memory stick project**<br>CAD – 3D Solidworks – development of skills learnt in Y9 | **USB memory stick project**<br>Practical – manufacture of parts using 3D CNC router<br>Theory – energy production and storage | **USB memory stick project**<br>Practical – manufacture using 3D CNC router<br>Producing engineering drawings of design using Solidworks | **USB memory stick project**<br>Practical – Assembly of component parts | **USB memory stick project**<br>Evaluation of product using client feedback to further develop idea and model on Solidworks |
| **Spring Term 2** | **Smart materials project**<br>Introduction to smart/modern materials | **Smart materials project**<br>Design ideas for novelty product using thermos chromatic sheet. | **Smart materials project**<br>Development of ideas<br>Theory - scales of production | **Smart materials project**<br>Manufacture of product parts<br>Theory – scales of production | **Smart materials project**<br>Assembly of final product | **Mechanical toy project**<br>Introduction to motion and mechanisms (levers) | **Mechanical toy project**<br>Theory and modelling sample mechanisms – linkages, gears, cams & pulleys |
| **Summer Term 1** | **Mechanical toy project**<br>Designing automata using cams and linkages | **Mechanical toy project**<br>Development and modelling ideas<br>Theory – forces and stresses | **Mechanical toy project**<br>Development and modelling ideas<br>Theory – materials properties (metals) | **Mechanical toy project**<br>Theory – materials management and creating cutting lists for product | **Mechanical toy project**<br>Practical – Manufacture of component parts for automata | **Mechanical toy project**<br>Practical – Assembly of product parts and finishing | **Mechanical toy project**<br>Evaluation and further development of product using client feedback |
| **Summer Term 2** | **NEA**<br>Initial investigation and establishing the problem to be solved | **NEA**<br>Research into the problem – using primary and secondary research | **Assessment window**<br>Revision sessions | **Assessment window**<br>Revision sessions | **NEA**<br>Research into the problem – using primary and secondary research | **NEA**<br>Specification – detailed specification linked to research findings | **NEA**<br>Investigation into design styles and possible design influences |

# KS4 - Year 11 – D&T GCSE

| | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 |
|---|---|---|---|---|---|---|---|
| **Autumn Term 1** | **NEA**<br>Review of research and specification.<br>Initial ideas created | **NEA**<br>Designing to reflect chosen design influence | **NEA**<br>Designing to reflect chosen design influence | **NEA**<br>Evaluation of designs and sketch developments | **NEA**<br>Physical modelling of chosen designs followed by model evaluation | **NEA**<br>CAD modelling using physical model evaluation | **NEA**<br>Manufacturing specification and ordering materials |

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| **Autumn Term 2** | **NEA**<br>Product manufacture – marking out cutting shaping – recording manufacturing diary | **NEA**<br>Product manufacture Use of CAD/CAM to design and make complex components | **NEA**<br>Product manufacture - Assessing product components and developing techniques | **Assessment window**<br>Revision sessions | **Assessment window**<br>Revision session | **NEA**<br>Product manufacture – Assembly of product components | **NEA**<br>Final product assembly |
| **Spring Term 1** | **NEA**<br>Gathering user feedback and critical evaluation | **NEA**<br>Future developments following user feedback | **NEA**<br>Review period to revisit work completed | **Revision programme**<br>Materials properties – wood (hardwood, softwood and manufactured boards).<br>Environmental impact of their use | **Revision programme**<br>Short design and make project using wood. Analysing properties and practical techniques | **Revision programme**<br>Materials properties – polymers (thermoplastics and thermosetting plastics)<br>Environmental impact of their use | **Revision programme**<br>Short design and make project using polymers.<br>Investigating industrial production processes |
| **Spring Term 2** | **Mock exams**<br>Revision sessions | **Mock exams**<br>Revision sessions | **Mock exams**<br>Revision sessions | **Revision programme**<br>Short design and make project using polymers.<br>Investigating industrial production processes | **Revision programme**<br>Materials properties – polymers (ferrous, no-ferrous and alloys)<br>Environmental impact of their use | **Revision programme**<br>Short design and make project using metals.<br>Investigating and carrying out casting process. | **Revision programme**<br>Short design and make project using metals.<br>Investigating and carrying out casting process. |
| **Summer Term 1** | **Revision programme**<br>Systems – electronic and mechanical.<br>Calculation of gear ratios and mechanical advantage.<br>Exam technique – mathematical based questions | **Revision programme**<br>Scales of production and ecological issues in design and manufacture. | **Revision programme**<br>Team project using batch production techniques | **Revision programme**<br>Product life cycle assessments and the 6R's. | **Revision programme**<br>Design strategies and use of data.<br>Exam technique answering product analysis and evaluation question | **Revision programme**<br>The work of others – extended research task into a key designer/design style. | **Revision programme**<br>Quality control and production aids |
| **Summer Term 2** | | | | | | | |

| How does the Five Year Curriculum Plan meet the ACE curriculum design? | |
|---|---|
| **Ambitious** | All projects are set up to push students thinking outside the box. Projects are career centred and allow students to investigate use of technology and skills which they may not be aware of and open their eyes to opportunities which they may have never expected to be within their grasp. |
| **Challenging** | All projects allow students to stretch their knowledge and more importantly practical abilities to master skills which they may not have been aware of let alone tried. Students are encouraged to utilise hand tools and modern manufacturing techniques in the workshop and are taught how prepare food from raw ingredients using a range of complex skills rather than pre-manufactured component ingredients. |
| **Engaging** | If D&T is not engaging then the curriculum has been set up poorly. It incorporates a wide range of activities, skills and knowledge which will reach out to all students. Most projects allow students to focus designs to their own style and all result in a manufactured product. |

**What are the current strengths of the Five Year Curriculum Plan?**

All D&T material areas are covered at KS3 giving a solid foundation for KS4 studies.
Projects build year on year (Skills and knowledge) allowing frequent opportunities to revisit content over the 5 years.
The plan at KS4 allows for all theory knowledge to be delivered during y10 meaning y11 can be used to focus on application of the knowledge during the completion of the NEA tasks.
The plan provides students with the opportunity of using a wide range of different skills and allows for freedom in the development of their outcomes keeping the curriculum engaging.

**What specific actions have to be taken in response to the above? Please consider:**

- Unit sequence changes;
- Content changes at KS3 and KS4;
- Modifications to ensure an ACE curriculum design;
- CPD for teachers in your subject area;
- Additional research you have to consider as part of this review.

More opportunities have been identified for students to participate in extra-curricular activities. More social and cultural opportunities need to be investigated to be incorporated into session.
Further work/research needs to be carried out to provide specific social/cultural capital opportunities with the organisations mentioned.
NLO needs the opportunity to attend AQA lead CPD face to face or online.

KS3 - Design and Technology National Curriculum

Design

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

Make

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

Evaluate

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

Technical knowledge

1. Understand and use the properties of materials and the performance of structural elements to achieve functioning solutions
2. Understand how more advanced mechanical systems used in their products enable changes in movement and force
3. 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
4. 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].

Cooking and Nutrition

1. Understand and apply the principles of nutrition and health
2. Cook a repertoire of predominantly savoury dishes so that they are able to feed themselves and others a healthy and varied diet
3. Become competent in a range of cooking techniques [for example, selecting and preparing ingredients; using utensils and electrical equipment; applying heat in different ways; using awareness of taste, texture and smell to decide how to season dishes and combine ingredients; adapting and using their own recipes]
4. Understand the source, seasonality and characteristics of a broad range of ingredients.