Curriculum Progression Pathway

DESIGN TECHNOLOGY

Why is the study of Design and Technology important?

Design and Technology is a practical and valuable subject. It enables students to actively contribute to the creativity, culture, wealth and well-being of themselves, their community, and their nation. It teaches students how to take risks and so become more resourceful, innovative, enterprising, and capable. Students develop a critical understanding of the impact of design and technology on daily life and the wider world. Additionally, it provides excellent opportunities for students to develop and apply value judgments of an aesthetic, economic, moral, social, and technical nature both in their own design and when evaluating the work of others.

The subject at Outwood Academy Ripon is split up into the following categories:

- KS3 Design and Technology: Design and making in plastic, wood, paper board, and textiles.
- KS3 Catering: Developing skills in cooking and exploring the main food groups.
- KS4 Design and Technology: Work within specialist material areas to design and make a product in a given context.
- KS4 Hospitality and Catering: Plan and create dishes to meet customer requirements and learn about the Hospitality & Catering industry

What skills will the study of Design and Technology teach you?

Design and Technology applies knowledge, skills, and understanding from within the subject itself, and also a wide range of other sources such as Science and Mathematics. Design and Technology will teach you to:

- Develop resilience by not being afraid of challenges when solving problems, but to break them down and keep trying.
- Be creative in developing solutions to real world problems.
- Use modelling and annotated sketches to develop and communicate ideas.
- How to act responsibly within a practical environment thinking of the safety of yourself and others.



- Identify how to competently use a range of practical techniques across a range of disciplines.
- Apply and use CAD/CAM (Computer Aided Design/ Computer Aided Manufacture) equipment to design and manufacture a range of products /components considering scale of production and precision.
- Work independently and part of a team to solve complex problems.
- Construct reasoned arguments to ethical, social and moral problems that have arisen due to technology and communicate these effectively.
- Identify links between different materials and contextual references.
- Test, evaluate and refine ideas and products against a specification, taking into account the views of intended users and other interested groups.
- Understand and apply the principles of nutrition and health.
- Cook a repertoire of predominantly savoury dishes so that they are able to feed themselves and others a healthy and varied diet.
- Become competent in a range of cooking techniques e.g. selecting and preparing ingredients: using utensils and equipment, applying heat in different ways: awareness of taste, texture and smell to decide how to season dishes and combine ingredients, adapting and using their recipes.
- Understand the source, seasonality and characteristics of a broad range of ingredients.

What will you know and understand from your study of Design and Technology?

- How to classify materials including smart materials and discuss their physical properties.
- How to use simple electronic circuits incorporating inputs and outputs.
- How to manufacture products with reference to their material's physical properties.
- How to use and adjust equipment and machinery depending on the task.
- Use learning from science and mathematics to help design and manufacture components and products.
- To consider the influence of a range of lifestyle factors and consumer choices when designing and analysing products.
- To know and understand additional factors to consider such as ergonomics, anthropometrics or dietary needs.
- To use a variety of approaches, for example biomimicry and user-centred design to generate creative ideas and avoid stereotypical responses.
- To evaluate their work against an increasing range of designers, engineers, chefs, technologists and manufacturers and be able to relate their product to their own designing and making.
- To evaluate products through disassembly to determine how they are constructed and function and consider the life cycle analysis.
- To competently use a range of cooking techniques for example, selecting and preparing ingredients; using utensils and electrical equipment.
- The principles of nutrition and health including energy, nutrients, water, fibre, diet and health and nutritional needs throughout life and the risks of an unbalanced diet.
- A repertoire of predominantly savoury dishes in line with the principles of the eatwell guide.

- To feed oneself taking into account personal preference, socio-economic aspects, nutritional and health needs.
- Healthy and varied diets as depicted in the eat-well plate and 8 tips for healthy eating.
- To explore the origin and product of food products and ingredients.
- To consider how seasons may affect the food available.
- To consider the function, nutrient profile and sensory attributes of ingredients.
- To study a range of food commodities e.g cereals, fruits, vegetables, meat, fish, eggs, fats/oils, milk dairy food products.
- To develop a range of preparation, cooking and presentation skills.
- To plan menus for a range of individual and nutritional needs.
- To prepare and cook safely, preventing food poisoning.
- To explore the effect of advertising, marketing and packaging on food choice.

How does your study of Design Technology support your study in other subjects?

Design Technology develops a number of skills that will support students' study of other subjects, as so many of the skills they will acquire in Design Technology are transferable. Design Technology disciplines will develop their focus, resilience, self-expression, teamwork, mathematical skills and problem solving and communication skills, which will help students in all of their other subjects. It will give students an opportunity for creative expression and practical thinking and encourage them to think about how to improve home designs and encourage healthy eating etc. Some students may take this even further and discover a subject that provides them with a life-long hobby or career that enhances their life for years to come. All students will gain an understanding of healthy diets etc. The ability to think creatively and problem solve are crucial in Engineering, Mathematics and Science. It will foster an interest and skill in cooking and may lead to study of subjects such as catering.

How can you deepen your understanding of Design Technology?

To enhance students' work in lessons, there will be times when we explore the professional workplace and wider design practices and materials. This will deepen their understanding of professional work and introduce them to new techniques and ideas.

Students will also have the opportunity to deepen their understanding of Design Technology disciplines through extracurricular opportunities, where they can continue to develop their creative ideas, or work on specific design projects. During enrichment clubs, students will have the opportunity to meet enthusiasts from other year groups, where they can share ideas, critique each other's work and continue to develop their technique.

There may also be an opportunity to participate in trips to local restaurants and have visiting speakers from a range of industries relating to technology, as well as exhibiting their own work within the Academy. Occasionally, there will be opportunities to enter national or Trust competitions to gain additional audiences and recognition for their work such as the Rotary club tournament and Young Chef competition.

How are you assessed in Design Technology?

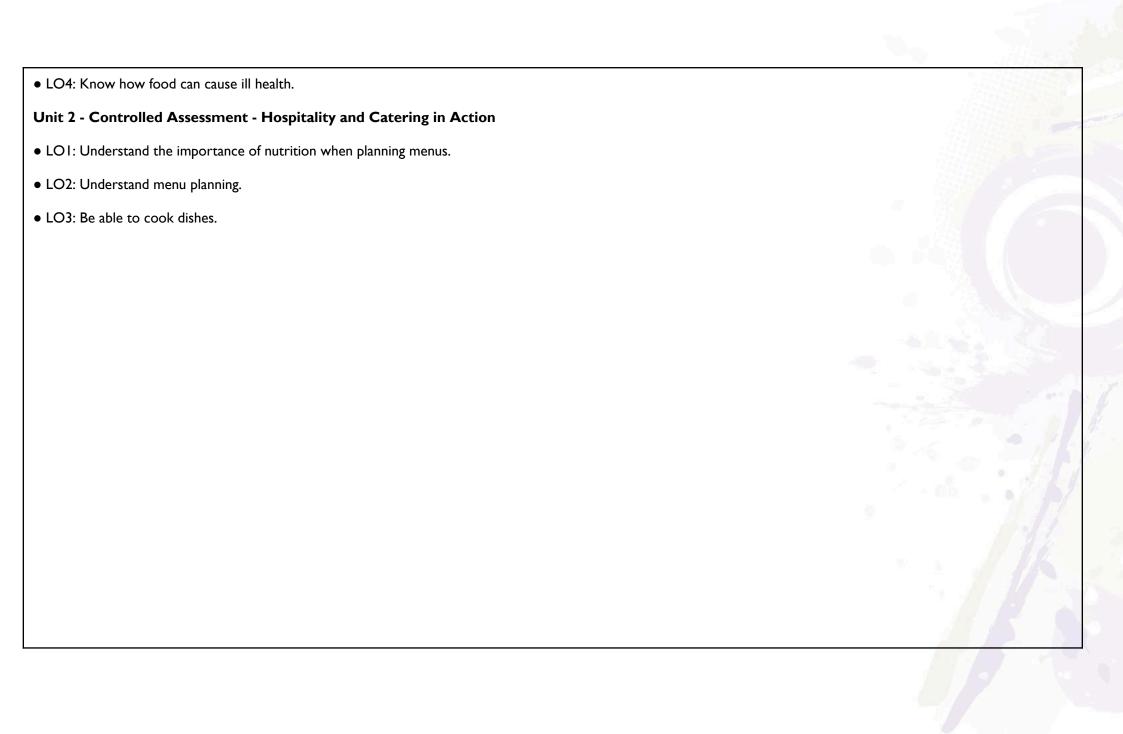
Throughout the 5 years in Design Technology students are assessed using the following assessment objectives which ensure that they can cumulatively build their subject understanding in preparation for future study. For KS3 and KS4 there are assessment points for students in the Praising Stars cycles, parents and carers receive more regular feedback from assessment points. In the lower years before certificated study we assess how students are performing against age related expectation and as students' progress on to BTEC or GCSE. We assess how their current stage of study reflects how they are on track to reach their end of KS4 targets which are formulated on aspirational expectation from their KS2 starting points. For both lower and upper years we make an informed prediction from our holistic assessments based on our subject mapping of expectation across the Design Technology curriculum.

Assessment Objectives in GCSE Design and Technology

- AOI: Identify, investigate and outline design possibilities to address needs and wants.
- AO2: Design and make prototypes that are fit for purpose.
- AO3:Analyse and evaluate: a. design decisions and outcomes, including for prototypes made by themselves and others b. wider issues in design and technology.
- AO4: Demonstrate and apply knowledge and understanding of: a. technical principles b. designing and making principles.

Assessment Objectives in Hospitality and Catering Unit I - Exam - The Hospitality and Catering Industry

- LOI: Understand the environment in which hospitality and catering providers operate.
- LO2: Understand how hospitality and catering provision operates.
- LO3: Understand how hospitality and catering provision meets health and safety requirements.



KS4 Assessment Objectives: Hospitality and Catering

Year I	Know and understand the factors that affect bacterial growth and their control (including temperatures) Know and understand the main causes of food contamination and the steps that need to be taken to prevent food poisoning.	Know and understand the causes and effects of an unbalanced diet Know and understand how to amend and develop a recipe to suit nutritional needs of individuals.	Know and understand how processing affects the physical, sensory and nutritional properties of foods.	Know and understand how economic factors determine food choices and nutritional health: High and low budgets effects of food poverty Know how to make informed choices about food from packaging and labelling.	Learners continue to develop their food preparation and cooking skills making complex dishes that meet the needs of users They are able to follow recipes independently. They are developing presentation and styling techniques.
Year 2	Be able to explain food safety legislation and the role of the Environmental Health Officer. Know and understand the HACCP system and the purpose for food businesses.	Be able to analyse and evaluate diets and make recommendations for improving nutritional profile. Be able to calculate energy and nutritional content of recipes Be able to explain health risks of an unbalanced diet and give sound nutritional advice on how to improve it.	Know and understand how cooking methods affect the nutritional content of dishes Know and understand why and how food is cooked and the chemical and physical changes that occur.	Know and understand how medical conditions determine food choices: Cardiovascular, obesity, bone health, dental health, type 2 diabetes, iron deficiency anaemia bowel disorders, allergies and intolerances.	Learners are able to organise their time, dovetailing planning to produce more than one complex dish in the time available. They are able to use equipment, including electrical equipment, with confidence. They are able to use presentation and food styling techniques independently. Be able to accurately portion foods.

KS3 Assessment Objectives Design and Technology

KS3	Design	Make	Evaluate	Technical Knowledge
	Use research and begin to explore, such as the study of different cultures, to identify and begin to understand	Select from a wider, more complex range of materials and components, taking into account their properties.	Select appropriate methods to evaluate their products in use and modify them to improve performance.	How to apply computing and use electronics to embed intelligence in products that respond to inputs.
	user needs.	Make simple use of planning tools for instance Gantt charts, communicate	Produce short reports	How to control outputs such as actuators and motors.
	To identify and solve issues within a design development task.	their plans clearly so that others can implement them.	making suggestions for improvements.	How to use software and hardware to develop programmes and transfer these programmable
	Develop specifications to inform the design of innovative, functional, appealing products	Use a broad range of material joining techniques including stitching, mechanical fastenings, heat processes and adhesives.	Evaluate products that they are less familiar with using themselves.	components for example, microcontrollers. How to make use of microcontrollers in products they design and manufacture
	that respond to needs in a variety of uses.	Make independent choices when selecting and using CAD/CAM to	Evaluate products considering life cycle analysis.	themselves.
	Use a variety of influences, to generate creative ideas and avoid stereotypical responses.	manufacture products/components and apply surface finishing techniques to increase the standard of quality.	Evaluate how products can be developed considering	

the concept of cradle to How to make adjustments to the settings of Follow procedures for safety and equipment and machinery such as sewing Use 2D and 3D to model and grave. understand the process of risk machines and drilling machines. develop their ideas. assessments. Test, evaluate and refine Use CAD software to validate their ideas and products Use learning from science and maths to help their designs in advance of Make independent choices when against the specification design and make products that work. selecting and using a broad range of taking into account the manufacture. manufacturing techniques including views of intended users and Understand the properties of materials, including hand craft skills and machinery to other interested groups. Develop and communicate smart materials, and how they can be used to manufacture products precisely. design ideas using annotated advantage. sketches, detailed plans, 3-D Evaluate new and emerging and mathematical modelling, Apply a range of finishing techniques technologies. oral and digital presentations to a broad range of materials. and computer-based tools. Evaluate an increasing range of designers, Consider additional factors engineers, technologists such as ergonomics and and manufacturers and be anthropometrics. able to relate their products to their own designing and making.

Use research, such as the study Produce ordered sequences and Evaluate their products How to classify materials by structure e.g hard of different cultures, to identify against their original words, soft wood, ferrous and non-ferrous, schedules for manufacturing products they design detailing resources specification and identify thermoplastics and thermosetting plastics. user needs. required. ways to improve them. Consider the physical properties of materials. e.g. Be able to outline a simple brittleness and malleability. specification to inform design Make use of specialist equipment to Actively involve others in ideas and guide their thinking. the testing of their mark out materials. How to use simple electronic circuits products. incorporating inputs and outputs. Use 2D packages to model Use a broad range of material joining techniques including stitching, Evaluate products through their ideas. Consider textile fibre sources eg.natural and mechanical fastenings, heat processes disassembly to determine synthetic. and adhesives. how they are constructed Produce models of their ideas and function. using CAM to test ideas. How materials can be cast in moulds. Select and use CAD/CAM to manufacture products/components Evaluate the positive and Be able to independently and apply surface finishing techniques negative impact that Make use of sensors to detect heat, light etc such generate creative ideas to increase the standard of quality. products can have in the as thermistors and light dependent resistors. informed by stimulus using wider world. annotations to explain key features relating to Investigate and develop skills in brief/specification. modifying the appearance of Test, evaluate and refine How to make adjustments to the settings of materials including textiles and other their ideas and products equipment and machinery such as sewing manufactured materials. against the specification machines and drilling machines. Consider additional factors taking into account the such as ergonomics and anthropometrics.

Follow procedures for safety and understand the process of risk assessments.	views of intended users and other interested groups.	Use learning from science and maths to help design and make products that work.
Select and use a broad range of manufacturing techniques including hand craft skills and machinery to manufacture products precisely. Apply a range of finishing techniques to a broad range of materials.	Evaluate new and emerging technologies. Evaluate an increasing range of designers, engineers, technologists and manufacturers and be able to relate their	Understand the properties of materials, including smart materials, and how they can be used to advantage.
	products to their own designing and making.	

KS3 Assessment Objectives: Cooking and Nutrition

KS3 Programmes of Study for cooking and nutrition Key messages, advice and explanatory notes (1-8) for schools	AOI: Understand health and safety relating to food and cookery. (Explanatory note 2)	AO2: Understand and apply the principles of nutrition and health. (Explanatory notes &4)	AO3: Understand the source, seasonality and characteristics of a broad range of ingredients. (Explanatory notes 5,7&8)	AO4: Understand factors relating to food choice (so that they are able to feed themselves and others a healthy and varied diet). (Explanatory note 3 &6)	AO5: Develop practical cooking skills (so that they become competent in a range of cooking techniques and able to cook a repertoire of predominantly savoury dishes). (Explanatory note 2)
	Know and understand how to identify risks (food poisoning, cross contamination) and minimise hazards in the cooking environment. Know and understand the difference between use by and best before dates)	Know and understand how nutritional requirements differ for specific groups of people (Life stages, allergies and intolerances) To understand how nutritional information and allergy advice on food packaging can be used	Know and understand how ingredients have different effects in a recipe and be able to describe the sensory, nutritional and physical functions of ingredients in recipes.	Know and understand the range of cultural and ethical factors that determine food choices: Religion Vegetarian/vegan Fair trade Animal welfare Advertising/marketing.	Learners will make dishes of increasing complexity that further develop their food preparation and cooking skills and use a range of commodities. -Making/shaping doughs -Sauce making - Blending - Frying -Whisking

Know and understand safe and hygienic working practices and the practical steps they can take to remain safe and hygienic. Know and understand safe preparation, usage, cleaning and storage of utensils and equipment. Know and understand the main food groups and examples of foods for each group (cereals, fruit, vegetables, meat, fish, eggs, fats/oils, milk/dairy food products). Know the sources and understand the functions of the nutrients that make equipment. Know and understand the main food groups and examples of foods for each group and examples of foods determine food choices: Availability (seasonal/locality) Food miles Organics Food waste Packaging and recycling Food waste Packaging and recycling Albiting -Creaming/ all-in-one Malting	ur pr st re	Know and Inderstand the Inderstand the Inderstand the Index of safe Itorage, cooking and Index of the Index o	to help make healthy choices (traffic lights).		Wassan day day and day	-Seasoning -Test for readiness
(primary, secondary processing).	ur hy pr ca sa K ur pr cl	inderstand safe and sygienic working bractices and the bractical steps they an take to remain afe and hygienic. Chow and safe breparation, usage, leaning and storage of utensils and	what is meant by a balanced diet using the current UK dietary recommendations (Eatwell guide and 8 Tips). Know the sources and understand the functions of the nutrients that make up a balanced diet. Know and understand the importance of exercise and energy	the main food groups and examples of foods for each group (cereals, fruit, vegetables, meat, fish, eggs, fats/oils, milk/dairy food products). Know and understand that foods come from a range of sources (caught, reared, grown). Know and understand that raw ingredients are processed to create food products (primary, secondary	range of social and environmental factors that determine food choices: Personal/family preference Availability (seasonal/locality) Food miles Organics Food waste	basic food preparation and cooking skills using a variety of food commodities: -Weighing/measuring -Knife skills (bridge/ claw) -Peeling - Segmenting -Boiling/ simmering -Rubbing in -Creaming/ all-in-one - Melting

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How can Design Technology support your future?

Of course, we offer GCSE Level courses, and we encourage students to continue studying in this fantastic subject. Yet we know that choice and personal interest are important aspects of worthy study. Whether students have continued their study of a discipline of Design Technology into GCSE or not they will have gained access to this wide enriching subject and its study of the various disciplines will have taught them to think differently and deeply.

Design courses are offered at most prestigious universities and there are many technical and vocational qualifications that can be studied in engineering, product design, graphics, electronics, catering, nutrition etc. as well as routes into apprenticeships etc. The very fact that students have been able to study creative thinking, problem solving, planning and design principles will help their future application be they for colleges, universities, apprenticeships or employment.

Careers linked to Design Technology:

- Product Designer
- Civil engineer
- Quantity Surveyor
- Graphic Designer
- Fashion Designer
- Branding designer
- Software Engineer
- Catering
- Nutritionist
- Food technologist
- Manufacturing Engineer / manager
- Architect
- Construction
- Aerospace engineer

The list is endless as study of Design Technology opens up a world of opportunities

YEAR 7	YEAR 8	YEAR 9
Year 7 D&T - CREATE Year	ear 8 D&T - INNOVATE	Year 9 D&T - EXPLORE
which will be split over the different elements who of D&T to ensure a broad curriculum is achieved where the key focus is learning achieved core materials. Students operate on a carousel system throughout the academic technic	which will be split over the different elements of D&T to ensure a broad curriculum is chieved where the key focus is developing esign skills / strategies whilst building on their echnical knowledge, operating on a carousel	Students will study I hour of D&T a week where the key focus is on applying their technical knowledge and design skills through a range of design problems / briefs. Year 9 has been designed to give students an idea of the demands and rigour expected from a GCSE in D&T.
exide: de: rar tec kno hai	a year 8 students will develop confidence exploring different design briefs, whilst using the esign process to develop outcomes using a large of manufacturing methods and echniques. Reflecting and building on existing mowledge through exploration of materials, andheld tools, machinery and modern manufacturing techniques.	

DT - Intro to DT

In the first few week's students are given a health and safety induction and introduced to the areas of study in design technology, Whilst developing students' knowledge of what Design and Technology is.

DT - Textiles Monster

IIn this project students will explore a variety of different materials and processes. They will work in plastics, woods and metal, exploring the properties of materials and manufacturing functioning of the prototype. processes. This project is an introduction for students into Textiles Technology and the practical area. The project is based around the theme of monsters' where students are challenged to design and make a plush toy monster.supports the initial design ideas working through to a final developed design idea, they will then make. Annotation of the design idea for textile techniques, materials and components. Developing drawing and annotation skills. Students will be guided through the Faculty Expectations and policies put in place to ensure every student knows the code of conduct. Students will use the key machines and tools that will be used throughout their 5 years at OAR and will

DT - Engineering time

Students are tasked with designing and making a clock based around the de still art and design lmovement.

The iterative design process will be key in this project and students will write up their findings along the way and using their core materials knowledge on timbers and plastics, they will come up with a final solution. Students will briefly cover isometric drawings and corporate ID / colour theory, but the aim will be on the

The emphasis on this project will be the design process and the use of cad /cam in industry, exploring qa/qc and also manufacturing methods. Students will consider the aesthetics of design alongside the functionality of the broduct.

Product design - Designed to Pop

This is a graphic design-based project where the taught how to use more traditional students will design and create pages of a children's book influenced by the work of pop up artist Robert Sabuda.. The focus will be on the use of typography, pop up mechanisms and overall design aesthetic. Students will also

DT - 'It's a Jolly Holiday' Activity Pack In this project students will work to create an activity pack for JET2 Airlines, to entertain children whilst aboard their commercial flights. The activity pack must contain the following products: A drawstring bag, a brain teaser toy, a small jigsaw puzzle and a colouring in activity. This project will enable students to combine their skills and knowledge gathered throughout their KS3 studies of Product Design.

Students have to identify a clear user, research their needs, write a specification and design a solution for their primary user. The emphasis of this project is accuracy and quality. Students use ligs and Formers to produce a similar project but are allowed to adapt the original design to meet their identified needs. Students will carry out primary research throughout to ensure their user is happy. Students will produce the moneybox using their knowledge of core materials learnt in Year 7 and 8. Students will be manufacturing methods, adhesives, finishing techniques but will be shown CAD (2D design) and CAM (Laser Cutter) to personalise the central design feature on their brain teaser

leave with their H&S passport signed off if they have met our expectations when using machines and equipment. Throughout the project students will be guided through the design process by analysing the design problem, writing their own specifications and responding to this by designing different solutions.

Product Design - Emoji Door Hanger (Graphics based project)

This project allows students to develop their design skills and knowledge of plastics, whilst exploring the history of emojis and typography. Through their work to design a door hanger to be sold as part of a childrens homeware collection for Next. Students will build on their skills of the design process to evaluate their designs, before working to draw their design digitally using CAD/ CAM software. Students' work will then be manufactured using a laser cutter to produce their finished product.

explore graphic design materials and manufacturing processes.

game, in order to demonstrate their understanding of the design brief.

Food and nutrition -

In year 7 students will develop a basic understanding of nutrition and culinary skills, building on existing knowledge obtained from decisions about food choice. Reflecting and key stage 2 Design and Technology. Split into topics including food safety, culinary skills, heat transfer, commodities, food science and food choice.

Food and Nutrition -

In year 8 students will develop confidence in cooking a range of dishes and make informed building on existing knowledge through exploration of the topics Nutrition, Food poisoning, food choice and culinary skills embedded in the projects below. Students will also learn about allergies and intolerances, how food supports a healthy body and the nutritional value of food groups, with a main focus on macro and micronutrients. Whilst exploring food labelling and how to calculate the nutritional breakdown of food.

Food and Nutrition-

Year 9 is a preparatory year where students will develop their making and presentational skills that demonstrate an understanding of the hospitality industry, producing dishes reflecting on dietary requirements and choices.

'The mad Hatter's Tea Party' What are the basic skills every chef should master?

The aim of this project is to give Year 7

comes from, how to cook a range of dishes safely and hygienically and to apply their knowledge of healthy eating. Knowledge and skills include use of basic equipment and tools, basic practical skills such as weighing, chopping, heat transfer explored using a gas and electric oven / hob, portion control, origin and simple functions of ingredients, healthy eating and The Eatwell Guide, food choice. Students will also

'London Underground'

Students will develop their core knowledge within food and nutrition, whilst also lunderstanding the importance of hygiene, students the opportunity to learn where food teamwork and roles within a kitchen. Within this project students will use their travel choices. Students will have one week to pass to travel on London underground and experience some of the world's cultural delights considering plate presentation. Students will by stopping off at each station to recreate the flavours of each destination including Little Italy and Camden Market, looking at food from different cultures. Exploring the different practices, attitudes, and beliefs as well as the networks and institutions surrounding the production, distribution, and consumption

'Ready Steady Cook'

Students will explore a range of chef challenges in the style of BBC programme Ready Steady Cook, that ask students to design menus for a chosen client's dietary requirements and research and design their dishes, whilst then have one hour to cook each course and present restaurant-quality food. Students will expand on their understanding of seasonality and nutrition when creating their dishes. Students will look at successful chefs and the style of dishes they create fusing nutrition and creativity together.

consider environmental factors and look at food miles and sources of food. Alongside exploring dietary requirements and choices. of food.

Students build on the basic food skills learnt in Year 7 but challenge students to produce more complex and rounded meals suitable for feeding ingredients, the source of their ingredients and a family. This project aims to expand the range of foods that students know how to cook by providing balanced and nutritional meals for the students to make, with an introduction to enhancing flavour through combining ingredients, seasonings and spices.

The complexity of techniques used becomes more challenging with students being asked to prepare a range of pastries, prepare sauces from scratch, use professional chopping methods, through paired tasks to prepare a range of multi element dishes using a range of cooking methods and asking for critical evaluation of their finished product.

By the end of the project, students will have a better understanding of where their ingredients come from, the function of different nutrients and the limitations that different faiths, religions, beliefs have on a dish.

Students will be building on the skills they have acquired over the past two years taking into consideration the nutritional functions of the the user's dietary needs.