Curriculum Progression Pathway

DESIGN TECHNOLOGY

Design Technology

Why is the study of Design and Technology important?

Design and Food technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils are able to adapt and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge which draw on disciplines such as mathematics, science and computing. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of products and dishes, they develop a critical understanding of its impact on daily life (sustainability and energy), health and the wider world (environment – waste & Fairtrade). High-quality education in design technology and food makes an essential contribution to the creativity, culture, wealth and especially impacts on well-being of the next generation.

Design and Food technology is important Redcar Outwood Academy aims to develop students in Design & Technology to become independent problem solvers, being able to apply the iterative process. For all stakeholders to recognise the importance and relevance of the subject in our fast-evolving modern society. Students will be taught to design responsibly through using the ACCESS FM tool and sustainability key concepts. They will not only prioritise responsible designing in their design projects but also become aware of the impact of waste, energy and their environmental footprint as well as encourage sustainable consumer decisions. Skills given to students will provide them with the potential to make a direct difference in future local, national, or international crises.

Design and Technology allows students to gain a better understanding of the world we live in, and how products are designed to enhance life. Students will explore a carousel of subjects under the Design Technology umbrella such as Design, and Food. Students will experience a range of material areas that will allow them to better understand links to core subjects such as Maths and Science by applying skills within contexts in design. Also explore "Why Designers need to consider social, moral and environmental issues?" when designing and manufacturing products. A particular focus is made on the responsibility and integrity of the designer and the decisions they make using ACCESS FM and SCAMPER.

Design technology at Redcar aims to develop independence in students, as they go on their own personal journey with their projects, guided by the teacher. This means that students need to positively self-regulate by managing their time when considering and participating in design activities. They also need to be intrinsically motivated to become resilient when facing issues in their projects. Every child will have the opportunity to solve problems in a practical way and be encouraged to take risks in their design work to develop innovative creative dishes and products. They will also have the chance to look at existing products in detail to analyse and evaluate them so that they can take inspiration from them for their own work. Students will encounter real life problems that will link directly to their core subjects, Maths and Science.

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

- Food - L1 / 2 Hospitality and Catering: Through WJEC Hospitality and Catering, students will: Explore a range job roles within the hospitality and catering industries to develop a range of transferable skills. Demonstrate effective and safe cooking skills by planning, preparing and cooking using a variety of food commodities, cooking techniques and equipment develop knowledge and understanding of the nutritional content of food and drinks. Investigate the relationship between diet, nutrition and health, including the physiological and psychological effects of poor diet and health. Explore the economic, environmental, ethical, and socio-cultural influences on food availability, production processes, and diet and health choices. Demonstrate knowledge and understanding of nutritional properties, sensory qualities and microbiological food safety considerations when preparing, processing, storing, cooking and serving food.

- Design - AQA Resistant Materials and Graphics Technology: Through Design technology students will be given opportunities to create, innovate, design, make and evaluate a variety of high quality products that are fit for purpose. Students will continue to work on the technical skills and craftsmanship to execute practical tasks, thereby developing confidence to increase their skills, knowledge and competence in using materials, machinery, techniques and processes. Students develop their practical skills and use these safely with a range of resistant and nonresistant materials, drawing media tools and equipment, in both 2D and 3D. They are shown how to communicate their ideas and designs skilfully and accurately in 2D and 3D, using a variety of techniques, including digital technology, manufacture in a range of material areas and CAD. They should know about good design, everyday products and use correct technical terminology with Design & Technology literacy. They will be allowed to investigate and analyse the rich history of design and technological innovation and the work of others, including iconic designs, to inform their own work. They will be shown developments in design and technology and the responsibilities of designers, including environmental responsibilitiesWork with materials like metals, plastic, wood, and use them to make interesting products. Students also learn how to use 2D and 3D modelling programs to plan and design products.

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 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 and discuss their physical properties.
- How to manufacture products with reference to their materials physical properties.
- How to use and adjust equipment and machinery dependent 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 Guide.
- 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 eg. cereals, fruits, vegetables, meat, fish, eggs, fats/oils, milk dairy food products.
- To study a range of different cooking methods such as frying, grilling, baking, broiling, boiling and roasting
- To develop a range of preparation, cooking and presentation skills.
- To plan menus for special diets - a range of individual and nutritional needs.
- To use food hygiene methods in preparation, cooking and storing safely to prevent 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 and technology is a form of art, and other subjects, including physics, maths, chemistry, PE, PSHE and IT. When it comes to the sciences, having knowledge of how physical and chemical processes work can come in handy when designing different products, including food. Design also supports the study of art, as sculpture and other disciplines require an understanding of how structures can be designed to support themselves. In PE it supports stamina, energy, repair of muscles through nutrition and government guidelines.

Design Technology develops a number of skills that will support your study of other subjects, as so many of the skills you will acquire in Design Technology are transferable. Design Technology disciplines will develop your focus, resilience, self-expression, teamwork, mathematical skills and problem solving and communication skills, which will help you in **all** of your other subjects. It will give you an opportunity for creative expression and practical thinking and encourage you to think about how to improve designs or how to encourage healthy eating. 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.

How can you deepen your understanding of Design Technology?

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

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

There may also be an opportunity to participate in trips as well as exhibiting your own work within the Academy. Occasionally, there will be opportunities to enter national or Trust competitions to gain additional audiences and recognition for your work.

How are you assessed in Design Technology?

Throughout the 5 years in Design Technology you are assessed using the following assessment objectives which ensure that you can cumulatively build your subject understanding in preparation for future study. There are assessment points each year that we term Praising Stars©. For KS3 these are termly and for KS4 these are every half term. In the lower years before certificated study we assess how students are performing against age related expectation and as students' progress on to Level 1 and 2 courses such as GCSE and BTEC 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 judgement from our holistic assessments based on our subject mapping of expectation across the Design Technology curriculum.

At Key Stage 4 - AQA Design Technology , the exams and non-exam assessment will measure how students have achieved the following assessment objectives.

- AO1: 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, design decisions and outcomes, including for prototypes made by themselves and others as well as wider issues in design and technology.
- AO4: Demonstrate and apply knowledge and understanding of: technical, designing and making principles.

Written exam: 2 hours and is worth 100 marks which is 50% of the GCSE

Non - Exam Assessment (NEA) is approx 30-35 hours long worth 100 marks which is 50% of overall

The WJEC Level 1/2 Vocational Award in Hospitality and Catering is assessed using a combination of internal and external assessment.

Students must follow the assessment objectives :

- AO1 Demonstrate knowledge and understanding from across the specification.
- AO2 Apply skills (including practical skills), knowledge and understanding in a variety of contexts and in planning and carrying out investigations and tasks.
- AO3 Analyse and evaluate information, making reasoned judgements and presenting conclusions

Unit 1: The hospitality and catering industry Written examination: 1 hour 20 minutes 40% of qualification

Unit 2: Hospitality and catering in action Controlled assessment: approximately 12 hours 60% of qualification

Assessment Objectives Design and Food Technology

Design

- Explore and use research collated such as the study of different cultures and identifying user needs and wants.
- Identify and solve design problems from exam boards and their own realisation of design concepts.
- Develop their own specifications to inform others of the aesthetics, function, appeal which responds to the needs of many situations.
- Use a variety of approaches such as user- centred design and biomimicry to generate creative ideas.
- Communicate design concepts through a variety of approaches such as annotated sketches, 2d / 3d computer design, modelling prototypes, through discussion and digital presentations.

Make

- Select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture
- Select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties
- 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 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 to suit customer specialist needs.
- Understand the source, seasonality and characteristics of a broad range of ingredients.
- Demonstrate their knowledge and understanding of hospitality and catering- the industry (theory) and "in action" (practical).
- Apply skills (including a broad range of practical skills), knowledge and understanding in a variety of contexts and in planning and carrying out investigations and tasks.

Evaluate

- Analyse the work of past and present professionals and others to develop and broaden their understanding
- Analyse and evaluate information, making reasoned judgements and presenting conclusions
- Investigate new and emerging technologies
- test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups

- understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists

How can Design Technology support your future?

Of course, we offer the study of GCSE and Level 1/2 Vocational courses and we encourage your continued study in this fantastic subject. Yet we know that choice and personal interest are important aspects of worthy study. Whether you have continued to study a discipline of Design Technology into GCSE or A-Level or not you will have gained access to this wide enriching subject and its study of the various disciplines will have taught you 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 you have been able to study creative thinking, problem solving, planning and design principles will help your future application be it for colleges, universities, apprenticeships or employment.

Careers linked to Design Technology:

- Product Designer
- Civil engineer
- Quantity Surveyor
- Graphic Designer
- Fashion Designer
- Product, Food, Fashion photographer
- Branding designer
- Software Engineer
- Nutritionist
- Food technologist
- Manufacturing Engineer / manager
- Architect
- Construction
- Aerospace engineer
- Hotel management
- Sports Science
- Marketing

- Journalism
- Product Development
- Food Science
- Consumerism
- Environmental Health
- Catering chef/Cook
- Dietician

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

DESIGN TECHNOLOGY CURRICULUM PROGRESSION OVERVIEW OUTWOOD ACADEMY REDCAR			
	YEAR 7	**YEAR 8**	**Year 9**
	Year 7 D&T Students will have one hour of D&T a week which will be rotated once in the year at Feb half term with Food. Food is also an integral part of the Health curriculum and the principles of healthy eating including practical sessions are taught within Health and wellbeing (PE).	**Year 8 D&T** Students will have one hour of D&T a week which will be rotated once in the year at Feb half term with Food. Food is also an integral part of the Health curriculum and the principles of healthy eating including practical sessions are taught within Health and wellbeing (PE).	**Year 9 D&T** Students will have one hour of D&T a week which will be rotated once in the year at Feb half term with Food. Food is also an integral part of the Health curriculum and the principles of healthy eating including practical sessions
Design / resistant Materials	• Introduction to Health and safety. • Paper modelling- monster bookends • Graphic design - Logo • Badge - production / making • Card Mechanisms • Designing for a celebration • Renewable sustainable energy • Wind turbines • Aerodynamics • Design and make- Glider • Helicopter	• Customer needs and wants • Graphics- Nets (mobile phone) • Access Fm- analysis of a product • Innovative design- initial ideas • SCAMPER- Design development • Prototype • Acrylic phone stand- line bending • Additive manufacture 3d printing- keyring • Social moral issues in design • TinkerCAD • Modification / evaluation / reviewing.	• Health and safety Law / ppe • Introduction -Recycle chair - Brief • ACCESS FM • Throwaway society • Anthropometrics and ergonomics • Structures • Morphing designs • Design Development SCAMPER • Chair challenge • 2d tech design • Slot chair / desk / table - wood -laser • Modifications/ evaluations / reviewing
Food Technology		• Bacteria and food poisoning • Danger zone- how to store food safely.	

	• The students will be introduced to safe practices covering **health and safety** in the kitchen. • Introducing classroom routines, **personal hygiene** , equipment, measuring out and **washing up.** • Learning knife skills and demonstrating them by following health and safety methods such as bridge and claw. • **Food provenance** - fruit and vegetables. Know where our food comes from. • Social and Environmental factors in food choices such as Seasonality and food miles. • Learning about **allergens and intolerances.** • **Hydration and fibre-** how it affects the body. • Students will learn cooking methods and develop them by making traditional, adapted, seasonal and religious dishes. • Understanding the main food groups. **Balanced and unbalanced diets** using government guidance - The **Eatwell Guide**. looking at the importance of **breakfast** and **food energy.** Dishes	• Food spoilage • Food security • Food wastage and consumption • Fairtrade • Food choice- religion, medical and preference • Vegetarianism • Additives • Food portioning	• Students will be introduced to industrial safe practices - **Personal protective equipment -law, regulations and use.** • **Kitchen hygiene** -following food safety legislation and food hygiene ratings. • Types of **establishments that serve foods** and different ways of serving food to customers.

	• **Fruit baskets** - knife skills, shaping, chopping and styling. • **Smoothie and breakfast roll** - knife skills, blending and baking. • **Fruit / vegetable crumble**- knife skills, shaping, weighing and measuring ingredients accurately, preparing ingredients, e.g. peeling, slicing;use the rubbing technique to make a topping;use the oven safely. • **Vegetable & chicken stir fry** - Preparing vegetables, knife skills- shaping into batons, combining ingredients to make a sauce, frying, and food safety. • **Salad in a Jar-** knife skills, preparing ingredients • **Savoury rice** • **Savoury muffin** • **Cheese and bacon scone** • **mini quiches**- portioning • **hedgehog bread** • **simple shortbread** • **Religion dish** -depends on the time of year.		

In year 9 students are taught food or design technology for ½ a year then rotate. Across this year they build upon the skills taught in that subject. Developing practical and design skills where applicable to inform their future choices into KS4 pathways such as Hospitality & Catering and Design Technology courses.