



## DESIGN TECHNOLOGY

### Design Technology

#### Why is the study of Design and Technology important?

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

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

- **Electronic products:** Use electronic materials to build interesting devices.
- **Food technology:** Design recipes and create food products while learning about nutrition.
- **Graphics:** Learn how to use 2D and 3D modelling programs to plan and design products.
- **Resistant materials technology:** Work with materials like metals, plastic, wood, and use them to make functional and aesthetically pleasing products.
- **Textiles technology:** Learn about different fabrics, how they are made, and ways you can use them to create 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 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 materials physical properties.
- How to use and adjust equipment and machinery dependent on 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 inline 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 eg. 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 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 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 and hone 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 etc.

### **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 Design and Technology students from other year groups, where you can share ideas, compete in competitions and continue to develop your knowledge and understanding of the subject.

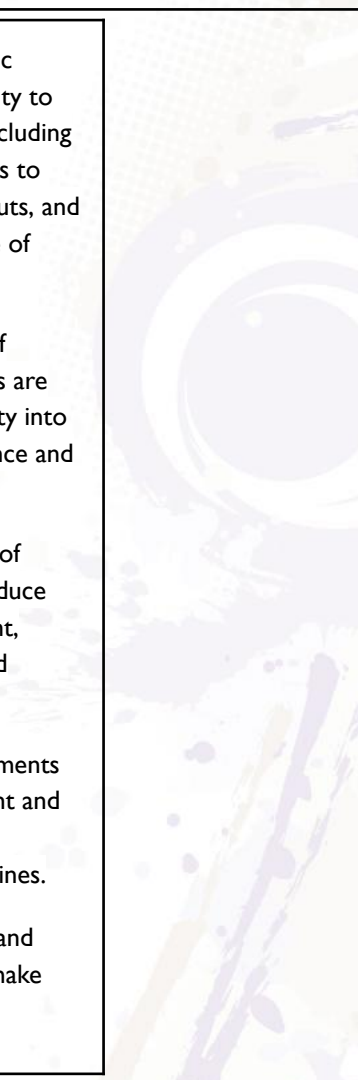
There may also be an opportunity to participate in trips as well as exhibiting your own work within the Academy. Occasionally, there will be opportunities to enter national or Trust competitions to gain additional audiences and recognition for your work such as the BA Crest Award, VEX Robotics competition and the Design Ventura competition run by the Design Museum in London.

## How are you assessed in Design Technology?

Throughout the 5 or 7 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 GCSE and A Level study. There are 6 assessment points each year that we term Praising Stars®. 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 prediction from our holistic assessments based on our subject mapping of expectation across the Design Technology curriculum.

## Assessment Objectives Design and Technology

	Design	Make	Evaluate	Technical Knowledge
KS4	<p>Understand that all design and technological practice takes place within contexts which inform outcomes</p> <p>Investigate and analyse the work of past and present professionals and companies in the area of design and technology in order to help inform their own ideas</p> <p>Use different design strategies, such as collaboration, user-centred design and systems thinking, to generate initial ideas and avoid design fixation.</p>	<p>Develop and apply in-depth knowledge by selecting and working with appropriate materials and components in order to produce a prototype</p> <p>Apply in depth knowledge using appropriate and accurate marking out methods including: measuring and use of reference points, lines and surfaces; use templates, jigs and/or patterns; work within tolerances; understand efficient cutting and how to minimise waste.</p> <p>Follow procedures for safety and write risk assessments.</p>	<p>Test, evaluate and refine their ideas and products against the specification taking into account the views of intended users and other interested groups.</p> <p>Critically evaluate new and emerging technologies to inform design decisions; considering contemporary and potential future scenarios from different perspectives, such as ethics and the environment.</p> <p>Evaluate an increasing range of designers, engineers, technologists and manufacturers</p>	<p>Understand the impact of new and emerging technologies on industry, enterprise, sustainability, people, culture, society and the environment, production techniques and systems.</p> <p>Know how energy is generated and stored in order to choose and use appropriate sources to make products and to power systems.</p> <p>Understand developments in modern and smart materials, composite materials and technical textiles.</p>

	<p>Design and develop at least one prototype that responds to needs and/or wants and is fit for purpose, demonstrating functionality, aesthetics, marketability and consideration of innovation</p> <p>Consider additional factors such as ergonomics and anthropometrics.</p>	<p>Use specialist techniques and processes to shape, fabricate, construct and assemble a high quality prototype, including techniques such as wastage, addition, deforming and reforming, as appropriate to the materials and/or components being used</p> <p>Use appropriate surface treatments and finishes for functional and aesthetic purposes</p>	<p>and be able to relate their products to their own designing and making.</p>	<p>Understand how electronic systems provide functionality to products and processes, including sensors and control devices to respond to a variety of inputs, and devices to produce a range of outputs</p> <p>Understand how the use of programmable components are used to embed functionality into products in order to enhance and customise their operation</p> <p>Understand the functions of mechanical devices, to produce different sorts of movement, changing the magnitude and direction of forces:</p> <p>Know how to make adjustments to the settings of equipment and machinery such as sewing machines and drilling machines.</p> <p>Use learning from science and maths to help design and make products that work.</p>	
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<p>Y9</p>	<p>The use of different design strategies to help come up with innovative ideas that avoid fixation of ideas.</p> <p>Work confidently within a range of relevant domestic, local and industrial contexts, such as the home, health, leisure, culture, engineering, manufacture etc.</p> <p>Consider the influence of a range of lifestyle and consumer choices when designing products.</p> <p>Take creative risks when making design decisions.</p> <p>Analyse where human values may conflict and compromise has to be achieved.</p> <p>Decide which design criteria clash and determine which should take priority.</p>	<p>Produce costings spreadsheets for products they design and make.</p> <p>Match and select suitable materials and their fitness for purpose.</p> <p>Adapt their method of manufacture to changing circumstances.</p> <p>Recognise when it is necessary to develop a new skill or technique.</p> <p>Follow procedures for safety and understand the process of risk assessments.</p> <p>Make independent choices when selecting and using a broad range of manufacturing techniques including hand craft skills and machinery to manufacture products precisely.</p> <p>Apply a range of finishing techniques to a broad range of materials.</p>	<p>Evaluate the concept of circular economy approaches in relation to product development and consumption.</p> <p>Test, evaluate and refine their ideas and products against the specification taking into account the views of intended users and other interested groups.</p> <p>Evaluate new and emerging technologies.</p> <p>Evaluate an increasing range of designers, engineers, technologists and manufacturers and be able to relate their products to their own designing and making.</p>	<p>How to construct and use simple and compound gear trains to drive mechanical systems from a high revving motor.</p> <p>How to make adjustments to the settings of equipment and machinery such as sewing machines and drilling machines.</p> <p>Use learning from science and maths to help design and make products that work.</p> <p>Understand the properties of materials, including smart materials, and how they can be used to solve a given problem or challenge.</p>
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	Consider additional factors such as ergonomics and anthropometrics.			
Y8	<p>Use research and <b>begin to explore</b>, such as the study of different cultures, to identify and <b>begin to understand user needs</b>.</p> <p>To identify and solve issues within a design development task.</p> <p>Develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of uses.</p> <p>Use a variety of influences, to generate creative ideas and avoid stereotypical responses.</p> <p>Use 2D and 3D to model and develop their ideas.</p>	<p>Select from a wider, more complex range of materials and components, taking into account their properties.</p> <p>Make simple use of planning tools for instance Gantt charts, communicate their plans clearly so that others can implement them.</p> <p>Use a broad range of material joining techniques including stitching, mechanical fastenings, heat processes and adhesives.</p> <p>Make independent choices when selecting and using CAD/CAM to manufacture products/components and apply surface finishing techniques to increase the standard of quality.</p> <p>Follow procedures for safety and understand the process of risk assessments.</p>	<p>Select appropriate methods to evaluate their products in use and modify them to improve performance.</p> <p>Produce shorts reports making suggestions for improvements.</p> <p>Evaluate products that they are less familiar with using themselves.</p> <p>Evaluate products considering life cycle analysis.</p> <p>Evaluate how products can be developed considering the concept of cradle to grave.</p> <p>Test, evaluate and refine their ideas and products against the specification taking into account</p>	<p>How to apply computing and use electronics to embed intelligence in products that respond to inputs.</p> <p>How to control outputs such as LED's and motors.</p> <p>How to use software and hardware to develop programmes and transfer these programmable components for example, microcontrollers.</p> <p>How to make adjustments to the settings of equipment and machinery such as sewing machines and drilling machines.</p> <p>Use learning from science and maths to help design and make products that work.</p> <p>Understand the properties of materials, including smart materials, and how they can be used to advantage.</p>

	<p>Use CAD software to validate their designs in advance of manufacture.</p> <p>Develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools.</p> <p>Consider additional factors such as ergonomics and anthropometrics.</p>	<p>Make independent choices when selecting and using a broad range of manufacturing techniques including hand craft skills and machinery to manufacture products precisely.</p> <p>Apply a range of finishing techniques to a broad range of materials.</p>	<p>the views of intended users and other interested groups.</p> <p>Evaluate new and emerging technologies.</p> <p>Evaluate an increasing range of designers, engineers, technologists and manufacturers and be able to relate their products to their own designing and making.</p>	<p>Understand the importance of CAD and CAM in the design and manufacture of a product.</p> <p>How Jigs, Templates and Formers are used to improve consistency and quality within the manufacturing of a product.</p>
Y7	<p>Use research, such as the study of different cultures, to identify user needs.</p> <p>Be able to outline a simple specification to inform design ideas and guide their thinking.</p> <p>Use 2D packages to model their ideas.</p>	<p>Produce ordered sequences and schedules for manufacturing products they design detailing resources required.</p> <p>Make use of specialist equipment to mark out materials.</p> <p>Use a broad range of material joining techniques including stitching, mechanical fastenings, heat processes and adhesives.</p>	<p>Evaluate their products against their original specification and identify ways to improve them.</p> <p>Actively involve others in the testing of their products.</p> <p>Evaluate products through disassembly to determine how they are constructed and function.</p>	<p>How to classify materials by structure e.g hard woods, soft wood, ferrous and non-ferrous, thermoplastics and thermosetting plastics.</p> <p>Consider the physical properties of materials. E.g brittleness and malleability.</p> <p>How to use simple electronic circuits incorporating inputs and outputs.</p>



	<p>Produce models of their ideas using CAM to test ideas.</p> <p>Be able to independently generate creative ideas informed by stimulus using annotations to explain key features relating to brief/specification.</p> <p>Consider additional factors such as ergonomics and anthropometrics.</p>	<p>Select and use CAD/CAM to manufacture products/components and apply surface finishing techniques to increase the standard of quality.</p> <p>Investigate and develop skills in modifying the appearance of materials including textiles and other manufactured materials.</p> <p>Follow procedures for safety and understand the process of risk assessments.</p> <p>Select and use a broad range of manufacturing techniques including hand craft skills and machinery to manufacture products precisely.</p> <p>Apply a range of finishing techniques to a broad range of materials.</p>	<p>Evaluate the positive and negative impact that products can have in the wider world.</p> <p>Test, evaluate and refine their ideas and products against the specification taking into account the views of intended users and other interested groups.</p> <p>Evaluate new and emerging technologies.</p> <p>Evaluate an increasing range of designers, engineers, technologists and manufacturers and be able to relate their products to their own designing and making.</p>	<p>Consider textile fibre sources eg.natural and synthetic.</p> <p>How to make a vacuum formed mould for the packaging industry.</p> <p>Understanding the differences between paper, card and board.</p> <p>Understanding the different classes of levers and how they can help give a mechanical advantage.</p> <p>How to make adjustments to the settings of equipment and machinery such as sewing machines and drilling machines.</p> <p>Use learning from science and maths to help design and make products that work.</p> <p>Understand the properties of materials, including smart materials, and how they can be used to advantage.</p>
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Assessment Objectives Cooking and Nutrition

<p><b>KS3</b> <b>Programmes of Study for cooking and nutrition</b></p> <p>Key messages, advice and explanatory notes (1-8) for schools</p>	<p><b>AO1: Understand health and safety relating to food and cookery</b></p> <p>(Explanatory note 2)</p>	<p><b>AO2: Understand and apply the principles of nutrition and health</b></p> <p>(Explanatory notes 1 &amp;4)</p>	<p><b>AO3: Understand the source, seasonality and characteristics of a broad range of ingredients</b></p> <p>(Explanatory notes 5,7&amp;8)</p>	<p><b>AO4: Understand factors relating to food choice (so that they are able to feed themselves and others a healthy and varied diet).</b></p> <p>(Explanatory note 3 &amp;6)</p>	<p><b>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)</b></p> <p>(Explanatory note 2)</p>
<p>KS4</p>	<p>Be able to explain food safety legislation and the role of the Environmental Health Officer.</p> <p>Know and understand the HACCP system and the purpose for food businesses.</p>	<p>Be able to analyse and evaluate diets and make recommendations for improving nutritional profile.</p> <p>Be able to calculate energy and nutritional content of recipes</p> <p>Be able to explain health risks of an unbalanced diet and give sound nutritional advice on how to improve it</p>	<p>Know and understand how cooking methods affect the nutritional content of dishes</p> <p>Know and understand why and how food is cooked and the chemical and physical changes that occur.</p>	<p>Know and understand how medical conditions determine food choices:</p> <p>Cardiovascular, obesity, bone health, dental health, type 2 diabetes, iron deficiency anaemia bowel disorders, allergies and intolerances.</p>	<p>Learners are able to organise their time, dovetailing planning to produce more than one complex dish in the time available.</p> <p>They are able to use equipment, including electrical equipment, with confidence.</p> <p>They are able to use presentation and food styling techniques independently.</p> <p>Be able to accurately portion foods.</p>

<p>Year 9</p>	<p>Know and understand the factors that affect bacterial growth and their control (including temperatures)</p> <p>Know and understand the main causes of food contamination and the steps that need to be taken to prevent food poisoning.</p>	<p>Know and understand the causes and effects of an unbalanced diet</p> <p>know and understand how to amend and develop a recipe to suit nutritional needs of individuals.</p>	<p>Know and understand how processing affects the physical, sensory and nutritional properties of foods.</p>	<p>Know and understand how economic factors determine food choices and nutritional health:</p> <p>High and low budgets</p> <p>effects of food poverty</p> <p>Know how to make informed choices about food from packaging and labelling.</p>	<p>Learners continue to develop their food preparation and cooking skills making complex dishes that meet the needs of users</p> <p>They are able to follow recipes independently.</p> <p>They are developing presentation and styling techniques.</p>
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<p>Year 8</p>	<p>Know and understand how to identify risks (food poisoning, cross contamination) and minimise hazards in the cooking environment.</p> <p>Know and understand the difference between use by and best before dates)</p> <p>Know and understand the principles of safe storage, cooking and reheating foods.</p>	<p>Know and understand how nutritional requirements differ for specific groups of people (Life stages, allergies and intolerances)</p> <p>To understand how nutritional information and allergy advice on food packaging can be used to help make healthy choices (traffic lights).</p>	<p>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.</p>	<p>Know and understand the range of cultural and ethical factors that determine food choices:</p> <p>Religion</p> <p>Vegetarian/vegan</p> <p>Fair trade</p> <p>Animal welfare</p> <p>Advertising/marketing.</p>	<p>Learners will make dishes of increasing complexity that further develop their food preparation and cooking skills and use a range of commodities.</p> <ul style="list-style-type: none"> <li>-Making/shaping doughs</li> <li>-Sauce making</li> <li>-Blending</li> <li>-Frying</li> <li>-Whisking</li> <li>-Seasoning</li> <li>-Test for readiness</li> </ul>
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<p>Year 7</p>	<p>Know and understand safe and hygienic working practices and the practical steps they can take to remain safe and hygienic.</p> <p>Know and understand safe preparation, usage, cleaning and storage of utensils and equipment</p>	<p>Know and understand what is meant by a balanced diet using the current UK dietary recommendations (Eatwell guide and 8 Tips)</p> <p>Know the sources and understand the functions of the nutrients that make up a balanced diet</p> <p>Know and understand the importance of exercise and energy balance in maintaining a healthy weight.</p>	<p>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)</p> <p>know and understand that foods come from a range of sources (caught, reared, grown).</p> <p>Know and understand that raw ingredients are processed to create food products (primary, secondary processing)</p>	<p>Know and understand the range of social and environmental factors that determine food choices:</p> <p>Personal/family preference</p> <p>Availability (seasonal/locality)</p> <p>Food miles</p> <p>Organics</p> <p>Food waste</p> <p>Packaging and recycling</p>	<p>Learners will be able to demonstrate a range of basic food preparation and cooking skills using a variety of food commodities</p> <ul style="list-style-type: none"> <li>-Weighing/measuring</li> <li>-Knife skills (bridge/ claw)</li> <li>-Peeling</li> <li>-Segmenting</li> <li>-Boiling/ simmering</li> <li>-Rubbing in</li> <li>-Creaming/ all-in-one</li> <li>-Melting</li> <li>-Folding</li> <li>-Baking</li> </ul>

### **How can Design Technology support your future?**

Of course, we offer the study of GCSE and A Level 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 your study of 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, Industrial design, graphic design, electronic engineering, catering, hospitality, nutrition 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 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

## DESIGN TECHNOLOGY CURRICULUM PROGRESSION OVERVIEW OUTWOOD ACADEMY EASINGWOLD


*THERE ARE SEPARATE OVERVIEWS FOR THE QUALIFICATIONS OFFERED AT GCSE IN OUR OPEN ELEMENT. THESE ARE SEPARATELY LISTED ON OUR ACADEMY WEBSITE THE GRID BELOW SHOULD REFLECT YOUR LOWER SCHOOL DELIVERY OF DESIGN TECHNOLOGY.*

	YEAR 7	YEAR 8	Year 9
<p>Students operate on a rotation throughout the academic year. This allows students to experience the different D&amp;T environments by moving around the department. Students will complete three projects throughout the first part of the year and a further three projects throughout the second half of the year.</p>	<p><b>Year 7 D&amp;T (Create)</b></p> <p>Students will have <b>two hours</b> of D&amp;T a week which will be split over the different elements of D&amp;T to ensure a broad curriculum is achieved where the key focus is learning about <b>core materials</b>. Students operate on a carousel system throughout the academic year.</p>	<p><b>Year 8 D&amp;T (Innovate)</b></p> <p>Students will have <b>two hours</b> of D&amp;T a week which will be split over the different elements of D&amp;T to ensure a broad curriculum is achieved where the key focus is developing <b>design skills</b> / strategies whilst building on their technical knowledge. In 2019/20 students take their projects in a linear model. In 2020/21 they will be on a carousel system.</p>	<p><b>Year 9 D&amp;T (Explore)</b></p> <p>Students at OAE will study <b>one hour</b> of D&amp;T a week where the key focus is on applying their <b>technical knowledge and design skills</b> through STEM related design problems / briefs. Fast paced, short, termly projects are given to students where they are expected to rise to the challenge by exploring possible outcomes using knowledge from Science, Technology, Engineering and Maths. Year 9 has been designed to give students an idea of the demands and rigour expected from a GCSE in D&amp;T / Engineering.</p>
<p>Autumn Term 1 / Autumn Term 2 / Spring Term 1</p>	<p><b>Sweet Tooth:</b></p> <p>This project is based around our local connections with Nestle and Rowntree. Students are asked to look at the history around this industry by designing a confectionary product for today's climate. Each student will look at branding, marketing and different</p>	<p><b>Box Fresh:</b></p> <p>This project is based around a brief from John Lewis that asks students to consider storing items to improve the comfort and efficiency of people's lives. Students have to identify a clear user, research their needs, write a</p>	<p><b>Top Gear Challenge (Autumn Term 1)</b></p> <p>Students are challenged to design and manufacture a car that will propel itself down a 10 metre strip in the quickest time possible. Students will research different ideas, test and trial the science behind their theory and build a prototype in teams to be entered into the competition. Students will use their knowledge from Year 7 and 8 of the materials, machinery, equipment and tools to manufacture their idea. Students will work to a tight</p>

	<p>communication techniques such as orthographic drawing, isometric, one and two point perspective. Once students have designed their confectionary they will produce a prototype chocolate bar with matching packaging and marketing.</p> <p>This project aims to give students an understanding of the basic core materials of paper, card and board. Students will understand how they are made, the origins of the raw material, their characteristics and how to use them effectively throughout the project.</p> <p><b>Mad Hatter's Tea Party:</b></p> <p>This project is based around the film of Alice in Wonderland and allows students to experience foods that are loosely linked to this theme.</p> <p>The aim of this project is to give Year 7 students the opportunity to learn where food comes from, how to cook a range of dishes safely and hygienically and to apply their knowledge of healthy eating.</p>	<p>specification and design a solution for their primary user.</p> <p>The emphasis of this project is accuracy and quality. Students use Jigs and Formers to produce a similar project but are allowed to adapt the original design to meet their identified need. Students will carry out primary research throughout to ensure their user is happy. Students will produce the storage device using their knowledge of core materials learnt in Year 7.</p> <p>Students will be taught how to use more traditional hand skills such as coping saws, hammers, adhesives, finishing techniques but will be shown CAD (2D design) and CAM (Laser Cutter) to personalise their box.</p> <p><b>The Underground:</b></p> <p>This project takes students around the multicultural city of London using the underground transport system. A different dish from across the capital represents the diverse culture that we can expect from living in London.</p> <p>Students build on the basic food skills learnt in Year 7 but this challenges</p>	<p>building schedule to ensure everyone is ready to race. Students will record their progress in the form of a diary.</p> <p><b>Product In a Tin (Autumn Term 2)</b></p> <p>Create a 'Product in a Tin' made using materials from at least two of the main materials categories used in Design &amp; Technology e.g. wood, metal, plastic, textiles and paper/board</p> <p>The product MUST use at least two different categories of D&amp;T materials but there's no restriction on the type of materials used, which combination of materials are used or how they are used in the product. For example an entry might combine wood and metal, wood and plastic, textiles and wood, plastic and textiles, paper and textiles or any other combination.</p> <p>The materials used can be in the form of a ready made/bought component or part or the material can be shaped and formed by the student. Whilst ready made components and parts can be used, entrants should note that judges are more likely to be impressed where students have shaped and formed materials themselves.</p> <p>Entries must be of a high quality with well executed techniques &amp; a finished piece of work that looks attractive. In particular, the product should look good from all angles and be fit for the purpose and user it was designed for.</p> <p>Entrants are encouraged to think about the product they design and how they can make it different from other entries. How can it solve a real design problem? Can the focus be on a design</p>
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	<p>Pupils will build on the learning in Key Stage 2 Design and Technology.</p> <p>Knowledge and skills include: use of basic equipment and tools, basic practical skills such as weighing, chopping, using a gas and electric oven / hob, portion control, origin and simple functions of ingredients, healthy eating and The Eatwell Guide, food choice.</p> <p><b>Woodbot Robot:</b></p> <p>This project is an introduction for students into the workshop / practical area.</p> <p>The project is based around the film 'Robots' where students are challenged to design and make a model of a robot to be sold in toy stores around the world.</p> <p>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 OAE and will leave with their H&amp;S passport signed off if they have met our expectations when using machines and</p>	<p>students to produce more complex and rounded meals suitable for feeding 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.</p> <p>The complexity of techniques used becomes more challenging with students being asked to use hobs and ovens at the same time, rough puff pastry, multiple elements to a dish and asking for critical evaluation of their finished product.</p> <p>By the end of the project, students will have a better understanding of the origins of their ingredients, the function of different nutrients and the limitations that different faiths, religions, beliefs have on a dish.</p> <p>The final lesson allows students to combine their cooking skills to produce a dish of their choice within the hour.</p> <p><b>Illumination:</b></p> <p>This project is a technology driven design brief and an introduction into electronics and systems. Students are</p>	<p>problem not close to the student's own experience e.g. linked to the <a href="#"><u>United Nations 17 Global Goals for Sustainable Development?</u></a></p> <p><b>Come Dine with me (Spring Term 1)</b></p> <p>Students will take part in a well known programme called Come Dine With Me. Students will be expected to research, design and manufacture a three course meal for at least four members of their family.</p> <p>Each course will be produced at school and taken home to be judged. Students will be given one lesson to research and organise their ingredients and one lesson to prepare and make the starter, main and dessert. Students will be building on the skills they have acquired over the past two years taking into consideration the nutritional functions of the ingredients, the source of their ingredients and the user's dietary needs.</p>
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	<p>equipment. Throughout the project students will be guided through the design process by analysing the design problem, writing their own specification and responding to this by designing different solutions. Students will be using jigs and templates to manufacture a robot to a high standard using the three core materials (Timbers, Metals and Polymers) students should know the different categories of three materials, the origins of the materials and some examples of each.</p>	<p>tasked with designing and manufacturing a light based around LED technology.</p> <p>By the end of the project students will know what a closed loop and open loop system is, what an I,O and P is, they will understand finite and non-finite energy sources, how power stations work and the origins of this power. Students will understand basic components and the functions of these and the basics of soldering to create their own circuit.</p> <p>The design element of this project is with the graphic / pattern they chose to laser cut onto the cast acrylic. Students will focus on using three techniques for designing (Biomimicry, design movements and inspirational design) to help them design their graphic. Students will be taught how to use cordless drills, different fixing (permanent and none permanent) techniques such as adhesives and screws. Recap of knowledge of timbers and polymers will be used with the introduction of new equipment such as files, scroll saws and oscillating sanders.</p>	
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<p>Spring Term 2 / Summer Term 1 / Summer Term 2</p>	<p><b>Frequency:</b></p> <p>This project asks students to consider how sound could be amplified. Students do this by analysing existing products, speaking to others and experimenting with prototypes that they will make to understand how the design can enhance the sound of a smartphone.</p> <p>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, 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 functioning of the prototype.</p> <p><b>The Funky Chicken</b></p> <p>This project is based around the sustainable use of materials, in particular textiles materials. Students are using the case study of a company called Refab that repurpose materials to manufacture new products.</p> <p>In this project students will be designing and making a funky chicken doorstep by learning basic textile skills (threading /</p>	<p><b>Bugs Life:</b></p> <p>Students are given the challenge of designing and manufacturing their own metal sculptural insect that will be sold in the merchandise shops at York theatre. The project is based around the film 'bugs life' and asks students to come up with a solution for a product to complement the theatrical version of the film at York Theatre.</p> <p>This project builds on the core material of metal learnt in Year 7 but teaches students how to work with the material in more depth. Students will know how to change the characteristics of metal by using heat and different alloys. Students will know the different categories of metals and the characteristics these would bring. Students would know the different elements that would influence their choice of metal such as oxidation, cost and availability.</p> <p>Students will learn how to shape and join metal by cutting, filing, brazing safely, enamelling, plastic coating The project will incorporate an element of up cycling and sustainability with students being asked to bring in metal items that have been discarded such as nuts, bolts,</p>	<p><b>Dyson Design Challenge</b></p> <p><b>(Spring Term 2)</b></p> <p>Students are given a task from the Dyson Design Challenge cards set up by the James Dyson Foundation. The aim of this project is to bring Science to life by solving a Dyson challenge card.</p> <p>Students will be asked to keep a boat afloat by using materials that aren't waterproof (paper, card and board) using their knowledge of these core materials; students will use the characteristics of the materials to their advantage. Each boat will have to carry 250 grams of weight and will be timed to show efficiency. Students will be encouraged to trial, test, model and develop a solution using scientific theory that they have researched. Students should consider water displacement, mass, stability, load, mass, forces and motions.</p> <p><b>Robot Wars (Summer Term 1)</b></p> <p>Students will be using control technology to design and manufacture a robot that can be used to compete in different challenges.</p> <p>Students will work in pairs programming their robot through VEXIQ robotics. In conjunction with the Computing department students will be able to pre programme part of the robot to make it semi-autonomous. Students will solve the problem by using iterations in their programming. Students must think about both the function of the robots and the programme to be successful.</p>
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	<p>using a sewing machine, tacking, seam allowance)</p> <p>The purpose of this project is to learn about the core material of fabrics, the origins and types of fabrics (woven, non-woven, natural, synthetic, blended) and the uses of these materials.</p> <p>Students will get the opportunity to learn about and use different methods of surface decoration such as Tie and Dye, transfer print, block printing, batik.</p> <p><b>Pinball Wizard</b></p> <p>The pinball wizard asks students to come up with a design for a retro gaming idea. The project is linked to the success of the UK gaming industry and challenges students to come up with their own theme for pinball games.</p> <p>Students will use research skills such as product analysis, analysis of the brief and mood boards to understand the market. The design element of this project will be two part, with one element looking purely at the aesthetics</p>	<p>bulldog clips and incorporate them into the design.</p> <p>An emphasis on quality of design will be important in this project. Students will be given time to take inspiration from unusual insects to create a unique design of their own. Students will be taught communication techniques such as thick and thin lines, rendering, tonal blending, highlight, lowlight, texture.</p> <p><b>It's a Cover Up</b></p> <p>Students are shown different designers, artists, design movements and fashions from the past decade. From this students are given the chance to design around a theme that inspires them. Building on their textile project from Year 7, students will be using similar techniques to produce a textiles product (A bag or a cushion) Skills / knowledge will include seam allowance, hems, surface decoration, sublimation printing, block printing, appliqué and embroidery. Students will be given freedom to upcycle fabric to decorate their textile products bringing in sustainability. A user will be identified to guide the student</p>	<p><b>BA CREST STEM Awards</b></p> <p><b>Summer Term 2</b></p> <p>To finish off the academic year, students will take part in a BA CREST STEM award (Bronze) which is an international competition that allows students to submit their work and be rewarded for it. CREST helps young people become independent and reflective learners through enquiry-based project</p> <p>Over the course of 10 hours, teams of students design their own investigation and record their findings, giving them a taste of what it is like to be a scientist or engineer in the real-world.</p> <p>Upon completion, students upload their work onto the STEM online platform, for moderation purposes.</p>
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	<p>of the pinball the other part will be looking at how it functions.</p> <p>Students will be taught about forces, motions and levers. Students will be using this to design the mechanism for the pinball machine. This project will also be using the core material from previous projects like Woodbot Workshop to construct the pinball machine. Elements of CAD such as 2D design, CGI (Publisher, Photoshop etc) can be used for the graphics.</p>	<p>through the design process and allow for a design criteria to be drawn up.</p> <p><b>Microbit/ Crumble / Aduino</b></p> <p>Students are introduced to programming in computing in the form of a BBC Microbit in Year 7. The aim of this project is to give some context behind the programmes by giving the student real world problems to solve.</p> <p>Students will be shown how to programme, the importance of controlling designed products, the advantages that automation can have and how to apply their programming skills.</p> <p>Students will work in teams to design and manufacture a solution to a given problem that must incorporate an element of control technology. Students will be allowed to revisit their designs to improve the efficiency of their solution.</p>	
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