

# Roundwood Park School



## KS3 Design and Technology

### Knowledge Outline for KS3 D&T and FOOD.

*“To guide, instruct and facilitate the development of; skilled independent and knowledgeable designers, makers, thinkers and logisticians. To ensure they are equipped to approach and **question** current, emerging and unforeseen problems and opportunities with cultural awareness, compassion, integrity, **responsibility**, equality and the passion to engage with and improve the world around them. Whether that be as responsible users and consumers, commercially adept and socially cognisant purchasers and suppliers or as the ethical, courageous and **risk-taking** designers, makers, engineers and problem solvers; that **create our future.**”*

Throughout our KS3 we are striving for students to be competent in the following;

- Understanding how to prepare for today and tomorrow by learning vital life skills over two subject areas.
- Have experiences with working with a large range of machinery and tools to **problem solve**.
- Understand how to become informed consumers that **reflect** on their practice.
- Learn key **insight** of nutrition and health.
- Experience bringing learning to life but having real life scenario problems to solve.
- To experience making prototypes both in the classroom and through extra and super-curricular opportunities.
- **To make links** of potential careers in our subject through extra-curricular clubs, trips, scholarships and talks from industry experts.
- Experience cooking in a real-life catering environment through our refurbished kitchen and extra-curricular events.
- Have a firm knowledge of user centered design, iterative design, problem solving, CAD/CAM knowledge and industry processes. In food this knowledge should be focused on the environment, different countries and cultures, animal ethics, current market trends, food waste and healthy eating.

Year / term	Unit of work	Core Knowledge and Skills Year 7	Intent of Year 7 D&T
YEAR 7	INTRODUCTION TO DRAWING SKILLS	<p><b>Skills-</b> Students complete technical drawing skills. They are introduced to CAD through sketch up program. Skills obtained to draw and recognise 1&amp;2 point perspective.</p> <p><b>Knowledge-</b> Understanding what CAM/CAD means using problem solving tasks and questions. Introduction to the design industry.</p> <p><b>Assessment-</b></p> <ol style="list-style-type: none"> <li>1) Isometric drawing task,</li> <li>2) Knowledge based questions on 1&amp;2 point perspective.</li> <li>3) Knowledge based Exam questions on CAD</li> </ol>	<p>By the end of year 7 a design and technology student should be able to recognise and replicate Isometric and technical drawing standards. They should have knowledge and understanding of kitchen and workshop H&amp;S practises and how to be safe in our area. They will have learnt how to create simple prototypes in wood and plastic and the theory behind this. They will have experimented with basic CAD software and begin to gather, present and use data and numeracy. They will be able to use the oven and cooker confidently, have gained knife skills and be able to combine a variation of ingredients using the all in one method and rubbing in.</p>
YEAR 7	INTRODUCTION TO DESIGN AND TECHNOLOGY	<p><b>Skills-</b> Researching, Problem solving, Communicating, Designing, Building, Peer assessing, Testing and evaluating, Calculating surface areas. Visualising and representing 2D and 3D forms including two dimensional representations of 3D objects.</p> <p><b>Knowledge-</b> Investigating existing products. Types of materials. Computer aided design. Computer aided manufacturing. Design thinking and communication. Manufacturing processes. Tools and equipment. Assembly processes and adhesives. Health and safety and risk assessment. Mathematics.</p> <p>Theory work on wood, and plastics.</p> <p><b>Assessment-</b></p> <ol style="list-style-type: none"> <li>1) Summative assessment of knowledge learnt in week 1-4.</li> <li>2) Summative assessment of knowledge learnt in week 5-8.</li> <li>3) Summative assessment of knowledge learnt in week 9-12.</li> </ol>	<p><u>Literacy in year 7</u></p>
YEAR 7	INTRODUCTION TO FOOD	<p><b>Skills-</b> Learning to weigh and measure, using the hob and cooker. Rubbing in method, all in one method, melting method and glazing. How to make bread. Preparing ingredients and equipment. Enrobing skills, preparing meat, testing food and sensory analysis. To combine, prepare and shape.</p> <p><b>Knowledge-</b> Food hygiene and the 4C's. Introduction to the Eatwell guide. Food safety and hazards. Diet through life and what determines a healthy diet. Carbohydrates and the function of yeast. High risk foods. Sensory analysis. Function of ingredients and evaluation of food.</p> <p><b>Assessment-</b></p> <ol style="list-style-type: none"> <li>1) Food hygiene and safety.</li> <li>2) Healthy living</li> <li>3) Eatwell guide project.</li> </ol>	<p>In our SOL throughout year 7 we complete a spelling test and a guided reading task in each term. In D&amp;T they read the theory of materials. A variety of DO NOW's are focused on common spelling errors Literacy. In all areas of D&amp;T we have a literacy reading board that students can access and use as extension activities.</p>
		<p><b>SUPER CURRICULAR</b></p> <p><b>D&amp;T-</b> Independently enter a design competition- look at the design Ventura website for inspiration, Carry out a study on your favourite designer or the work they have achieved over time. e.g. Alessi. How has their life changed through their design work? Design and build a prototype model in an area of design you are knowledgeable and interested in. This could be food, mechanical, graphical, electrical or textile based.</p> <p><b>FOOD-</b> Look through food websites such as Good Food website. There is huge range of choice available. Carry out a taste testing experiment on your family and record the results in a sensory analysis chart. Attend after school cooking clubs or gastro club.</p>	

Year / term	Unit of work	Core Knowledge and Skills Year 8	Intent of Year 8 D&T
YEAR 8 6 week project (2 x hours per week)	Skills, materials and processes.	<p><b>Knowledge-</b> Investigating existing products. Types of materials. Computer aided design. Computer aided manufacturing. Design communication and thinking. Manufacturing processes. Tools and equipment. Assembly processes and adhesives. Mathematics.</p> <p><b>Skills-</b> Researching. Problem solving. Communicating. Designing. Building. Peer assessing. Testing and evaluating. Calculating surface areas. Visualise and represent 2D and 3D forms including two dimensional representation of 3D objects.</p> <p><b>Assessment-</b> 1)CAD/CAM assessment. 2) Workshop practice. 3) Metals.</p>	<p>By the end of year 8 a design and technology student should build on the basic knowledge learnt in year 7 of the tools and equipment throughout D&amp;T and begin to incorporate real life scenarios and problems into their designing. They will experience digital manufacturing and focus on the manufacturing processes used in industry. In food, they will build on their prior knowledge of bread to learn about pizza and pastry. They will understand the terms gelatinisation and aeration. They will use their prior knowledge of the Eatwell guide to expand and study the macronutrients including analysing recipes regarding their nutritional properties.</p>
YEAR 8 6 week project (2 x hours per week)	Cities in the Ocean	<p><b>Knowledge-</b> Understanding of global issues - population growth, climate change, rising sea levels. Present information verbally, graphically and in written reports. Use a range of curricular sources to gain information. Environmental and social issues - global warming, climate change, population growth. Suitability of materials. Understanding of structures and forces. Understanding of real-world problems. Generate, develop, model and communicate ideas. Understanding of primary users and stakeholders</p> <p>Rapid Prototyping, Testing and evaluation, presentation techniques, communication. Test and evaluate design ideas through the use of tables and charts. Carrying out primary and secondary research. Creating a design brief. Prototyping, use of CAD- 2D and 3D modelling. Use of CAM.</p> <p><b>Assessment-</b> 1)Rapid prototyping and design thinking. 2) Cities in the ocean- end of unit assessment. 3)Journey to School- Step by step prototype.</p>	
YEAR 8 12 week project (2 x hours per week)	On the Move-	<p><b>Skills-</b>Researching, Problem solving, Communicating, drawing, designing. Building components. Peer assessing. Testing and evaluating. Calculating surface areas and volumes. Calculating ratios in the scaling of drawings and models. Visualising and representing 2D and 3D forms including two dimensional representations of 3D object.</p> <p><b>Knowledge-</b> Exploring the context, i.e. primary user, stake holders, Investigating existing products Materials and components, Aerodynamics, Forces, Structures, Types of motion, Material properties and characteristics. Technical understanding, Design thinking and communication, Manufacturing processes, Tools and equipment. Workshop safety. Prototype modelling. Mathematics</p> <p><b>Assessment-</b> 1)Aerodynamics. 2) Forces/gliders. 3)End of unit assessment.</p>	
YEAR 8 TERM 3 12 week project (2 x hours per week)	The Eatwell Guide- Food	<p><b>Skills-</b> Weigh and measure, pastry skills, knife skills, all in one method. Dough- kneading, proving, fermenting. How to stir fry. Prepare ingredients and equipment, testing food. Using the cooker/oven grill. Cooking methods, Combine, prepare and shape. Making sauces and doughs. Evaluating food through taste.</p> <p><b>Knowledge-</b> Food labels and energy needs. Carbohydrates and the science of bread making. Gelatinisation. Fibre and water in the diet. Dairy and calcium. The pastry processes. Fats. Aeration and folding. Designing their own pasta dish. Looking at chefs work and comparing it to their own. How to create a method sheet.</p> <p><b>Assessment-</b> 1) Summative assessment of knowledge learnt. 2) Summative assessment of knowledge learnt. 3) Pasta assessment sheet.</p>	

Year / term	Unit of work	Core Knowledge and Skills Year 8	Intent of Year 8 D&T
		<p><b>SUPER CURRICULAR</b></p> <p>D&amp;T- Independently enter a design competition- look at the design Ventura website for inspiration, Carry out a study on your favourite designer or the work they have achieved over time. e.g. Alessi. How has their life changed through their design work? Design and build a prototype model in an area of design you are knowledgeable and interested in. This could be food, mechanical, graphical, electrical or textile based. It's never too early to start dreaming. Using UniFROG investigate at least 3 University Courses that are based in areas of design that interest you. Take your mobile phone for a walk. Capture images from your local area or places that you visit that demonstrate a variety of styles of architecture. Begin a scrap book of your findings. Now Make This by Thomas Bärnthaller Find a TED Talk that give you advice on how to be more creative and innovative.</p> <p>FOOD- Read about Jamie Oliver's career- how has he helped schools through the school food plan? Visit a pop-up farm or pick your own. Find a favourite recipe passed down from your family and try it! Research your own savoury recipe and cook for a sibling or relative. Find a recipe book in the library from a well-known chef and read through it for 15minutes.</p>	<p><u>Literacy in year 8</u></p> <p>In our SOL throughout year 8 we complete a spelling test in each term and reading literacy tasks. In D&amp;T they read in class on stakeholders and learn their definition. A variety of DO NOW's are focused on reading and key words. In the graphics-based module, students listen to a podcast.</p>

Year / term	Unit of work	Core Knowledge and skills Year 9 - Core	Intent of D&T Year 9
YEAR 9 TERM 1	Branding and merchandising.	<p><b>Skills-</b> Researching, communicating. Designing. Visualising and representing 2D and 3D sketch forms. Building scale models. Peer assessing. Testing and evaluating. Calculating surface area.</p> <p><b>Knowledge-</b> Investigating existing products. Influence of marketing and branding. Understanding materials. Understanding colour theory. Recognising product and packaging symbols. Printing processes. CAD and digital technology. CAM, CNC manufacturing. Scales of production. Ensuring accuracy when making prototypes and products. Design thinking and communication. Tools and equipment. Creating NET packaging. Assembly processes and adhesives. Health and safety. Calculating surface area and volumes.</p> <p><b>Assessment-</b></p> <ol style="list-style-type: none"> <li>1) Branding and merchandising</li> <li>2) Colour theory</li> <li>3) Workshop modelling.</li> </ol>	<p>By the end of year 9 in Design and technology, students will be confident in their use of tools both in the workshop and in the kitchen. They will understand the H&amp;S implications of more complex knife skills and machinery. They will look more at the world around them and how other cultures can benefit from our subject. They will focus on real life environmental problems such as sustainability, food miles and animal welfare. They will use maths skills to model and design. They will design and make their own recipes and prototypes.</p>
YEAR 9 TERM 2	Sustainable living, water tower filtration unit	<p><b>Knowledge-</b> Exploring the context, i.e. situation, primary user, stake holders, Sustainable living. Investigating existing products. Materials and components. Wider implications. New and emerging technologies. Technical understanding. Design thinking and communication. Workshop practice. Tools and equipment. Prototype modelling. Mathematics.</p> <p><b>Skills-</b> Researching, Problem solving. Communicating. Drawing. Designing. Building components. Peer assessing. Testing and evaluating. Calculating surface areas and volumes. Calculating ratios in the scaling of drawings and models. Visualising and representing 2D and 3D forms including two dimensional representations of 3D objects</p> <p><b>Assessment-</b></p> <ol style="list-style-type: none"> <li>1) Sustainability</li> <li>2) Water</li> <li>3) Water filtration.</li> </ol>	
YEAR 9 TERM 3	Food preparation and choice- Food	<p><b>Knowledge-</b> Food from different countries and cultural dishes. Vegan and vegetarians- how animals are treated in the country. Sustainability. Food analysis and nutrition. Food hygiene and safety. Gelatinisation. Food miles and seasonality. Choosing recipes. Adapting foods for their nutritional content. Environmental impact of food. Choosing their own recipes and planning their own methods. Fortification of food. Dietary needs of a teenager.</p> <p><b>Skills -</b> Weigh and measure, pastry skills, knife skills, rolling sping rolls. Using a wok. Prepare ingredients and equipment, testing food. , using the cooker/oven grill. Cooking methods, Combine, prepare and shape. Making sauces-custard. Evaluating food through taste. Following their own method.</p> <p><b>Assessment-</b></p> <ol style="list-style-type: none"> <li>1) Vegan research</li> <li>2) Presentation challenge- practical assessment.</li> <li>3) Summerative assessment of knowledge learnt.</li> </ol>	

Year / term	Unit of work	Core Knowledge and Skills Year 8	Intent of Year 8 D&T
		<p><b>SUPER CURRICULAR</b></p> <p><b>D&amp;T:</b> Independently enter a design competition- look at the design Ventura website for inspiration, Carry out a study on your favourite designer or the work they have achieved over time. e.g. Alessi. How has their life changed through their design work? Design and build a prototype model in an area of design you are knowledgeable and interested in. This could be food, mechanical, graphical, electrical or textile based. Read articles on the MoDA website. MoDA (The Museum of Domestic Design &amp; Architecture) is part of the Middlesex University and is an accessible research collection. Read the MBDA website. Write the out three things to remember about MBDA in Stevenage. Find out the types of jobs and qualifications needed to work at MBDA in Stevenage. Read the TRENT PARK MUSEUM website and then visit it. What were they listening for at Trent Park? Write a diary. Read articles about electric bikes, discuss advantages and disadvantages. Visit the Mark Hall Cycle Museum. Find out how the bicycle has developed over the years, create an infographic timeline. Read about your favourite designer and do further research. Find out and read what the V&amp;A's DesignLab is all about. Visit The Victoria and Albert Museum. Pick a V &amp; A DesignLab project and work through it.</p> <p><b>FOOD-</b> Look through food websites such as Good Food website. There is huge range of choice available. Carry out a taste testing experiment on your family and record the results in a sensory analysis chart. Research current food trends by using Good Food Magazine or the internet .Look up and try technical challenges from the Great British Bake off. Find out about jobs in food production farming, food research and nutrition. Read about a local chef, how did they train? Visit the farmers market in Harpenden. Speak to family and find out how food/trends equipment and dietary advice have changed. Read one of Jamie Oliver's recipe books. What style of food does he cook? Interview a friend or family member about their favourite foods. Find out from an older member of the family what dishes they cooked when they were at school.</p>	<p><b>Literacy in year 9</b></p> <p>In our SOL throughout year 9 we complete a spelling test in each term and a literacy reading task. In D&amp;T they read the theory of materials. A variety of DO NOW's are focused on common spelling errors and general Literacy. In all areas of D&amp;T we have a literacy reading board that students can access and use as extension activities.</p>

Year / term	Unit of work	Core Knowledge and skills Year 9 - OPTION	Intent and Skills of Year 9
YEAR 9	Inclusive design, ergonomic pen modelling.	<p><b>Knowledge</b>-Exploring how contexts inform decisions and outcomes, the importance of usability when prototyping, what opportunities and constraints influence designing and making, the wider implications that can have an influence on the process of designing and making, how designers source information when problem solving, the impact of new and emerging technologies.</p> <p><b>Skills</b>-Analysis, evaluation, comparison, measuring, data generation, collation, presentation and analysis, transposition of knowledge and concepts, research and dissemination, scratch prototyping, CAD based and freehand drawing organic forms, using mirror images and crating, working with scale, experimenting with SMART material, application, implication and re-usability, marketing and promotion.</p> <p><b>Assessment-</b></p> <ol style="list-style-type: none"> <li>1)Inclusive design and anthropometrics data.</li> <li>2)Biometrics</li> <li>3) End of term assessment.</li> </ol>	<p>These SOL build and expand from the projects completed in the Core DT lessons. In food, they will start to look at food science and how to carry out food experiments. They will be given further opportunities to develop their expertise at designing their own recipes and recap key processes such as shortening and aeration. In D&amp;T they will be given further opportunities to develop their expertise and further explore aspects of the design process e.g. levers and motions whilst gaining knowledge of new and emerging technologies including smart materials.</p>
YEAR 9	Mechanical engineering-	<p><b>Knowledge</b>-Forces/Mechanical systems. The four types of motion. The basic principles of a lever. How linkages, cams, gears and pulleys transfer motion. Properties of materials Standard components, Measurements and production aids. Impact on industry. Explain the impact of new and emerging technologies on industry and enterprise. Ecological, Environmental and Social Issues Explain how designing and making is affected by ecological, environmental and social issues. The benefits of fair trade for producers and customers</p> <p><b>Skills</b>-Energy Generation, how energy is generated and stored. Selection of materials. Reinforcement used in products. The range of factors that can influence the choice of material for a product. Using quality control and quality assurance (QC &amp; QA). Manufacturing Processes: Electronics Systems. Follow the processes and equipment used to manufacture electronic systems. Understand, select and use appropriate input, process and output devices in production</p> <p><b>Assessment-</b></p> <ol style="list-style-type: none"> <li>1)Energy and mechanisms</li> <li>2)Forces and structures.</li> <li>3) Impact on new and emerging technology</li> </ol>	
YEAR 9	Food and the environment-	<p><b>Knowledge</b>- Food miles and sustainability. Free range and freedom foods. Food analysis and nutrition. Food hygiene. Food poisoning. Selecting a recipe. Introduction to food science and the raising agents in food</p> <p><b>Skills</b>- Weigh and measure, pastry skills, knife skills, shortening. Aeration. How to make pasta from scratch. Cake decorating skills. Presentation skills. Dough- kneading, proving, fermenting. Enrobing. Prepare ingredients and equipment, testing food. Knife skills, using the cooker/oven grill. Cooking methods, Combine, prepare and shape.</p> <p><b>Assessment-</b></p> <ol style="list-style-type: none"> <li>1) Food poisoning research sheet.</li> <li>2) Presentation challenge- practical assessment.</li> <li>3) Summative assessment of knowledge learnt.</li> </ol>	
		Extra Curricular- see year 9 core.	