

# Roundwood Park School



## Design and Technology.

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

*“To guide, instruct and facilitate the development of; skilled and knowledgeable designers, makers, thinkers and logisticians. To ensure they are equipped to approach 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 innovative 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.
- Understand how to become informed consumers
- Learn key knowledge of nutrition and health.
- Experience bringing learning to life but having real life scenario problems to solve.
- To experience making prototypes both in the SOL and in extra-curricular clubs.
- Have a knowledge 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	<b>Core Knowledge and Skills Year 7</b>	<b>Intent of Year 7 D&amp;T</b>
<b>YEAR 7 TERM 1</b>	<b>Design communication and thinking-</b> Graphics	<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/CAM 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 1&amp;2 point perspective drawings. 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, metal and plastic and the theory behind this. They will have experimented with basic CAD software. 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>
<b>YEAR 7 TERM 2</b>	<b>Skills, materials and processes-</b> Workshop	<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> Workshop health and safety booklet, different machine and how to use them safely. Real life scenarios.</p> <p>Theory work on wood, metals and plastics, product analysis. Maths cross-curricular, evaluation.</p> <p><b>Assessment-</b></p> <ol style="list-style-type: none"> <li>1) Understanding CAD and CAM.</li> <li>2) Knowledge based question on Materials.</li> <li>3) Knowledge based questions on Metals</li> </ol>	
<b>YEAR 7 TERM 3</b>	<b>Learning to cook-</b> 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. Food safety. High risk foods, hazards and diet through life. Function of ingredients and evaluation of food.</p> <p><b>Assessment-</b></p> <ol style="list-style-type: none"> <li>1) Research on high risk foods,</li> <li>2) Analysing a hazard environment.</li> <li>3) Sensory analysis of muffins.</li> </ol>	

Year / term	Unit of work	Core Knowledge and Skills Year 8	Intent of Year 8 D&T
YEAR 8 TERM 1	Cities in the Ocean /Journey to school. Infographics and 3D printing- Graphics	<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><b>Skills-</b> 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></p> <ol style="list-style-type: none"> <li>1)Rapid prototyping and design thinking.</li> <li>2) Cities in the ocean- end of unit assessment.</li> <li>3)Journey to School- Step by step prototype.</li> </ol>	<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 the 3D printer and focus more on the manufacturing processes 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 TERM 2	On the Move- Workshop	<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></p> <ol style="list-style-type: none"> <li>1)Aerodynamics.</li> <li>2) Forces/gliders.</li> <li>3)End of unit assessment.</li> </ol>	
YEAR 8 TERM 3	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> Macronutrients- Protein/fats/carbohydrates/vitamins/minerals/ fibre. Informed choices for a healthy diet. Diet through life. Food analysis and nutrition of a food label. Diet related risks. Food hygiene. Theory of gelatinisation. Aeration. Theory of bread. Designing their own pasta dish. High risk foods. How to create a method sheet.</p> <p><b>Assessment-</b></p> <ol style="list-style-type: none"> <li>1)Construct a flow chart.</li> <li>2) Computer research on the school food plan and nutritional analysis of a recipe.</li> <li>3) Food safety sheet on high risk foods.</li> </ol>	

Year / term	Unit of work	Core Knowledge and skills Year 9- Core	Intent of D&T Year 9
YEAR 9 TERM 1	Paper engineering- Graphics	<p><b>Skills-</b> Laminator printing, vacuum forming, craft knife skills. Measurements and production aids. Manufacturing Processes - Process Types and Processing used with Paper and board. Wasting, addition and reforming. How jigs, templates and patterns are used in production manufacture. The reason why accuracy is important when manufacturing products and prototypes. Quality control and quality assurance (QC &amp; QA). Importance of tolerances when manufacturing products. Selection of materials, factors that can influence the choice of material for a product, important properties required by commercial products, Impact of CAD and CAM on production.</p> <p><b>Knowledge-</b>Primary users, packaging. Ecological, Environmental and Social Issues. Fairtrade. The work of other designers. The main features of iterative design, user-centred design and system-based approach to design. Impact of Society and the Environment. The impact of the new, emerging technologies on sustainability and the environment. The characteristics of Materials paper and board. The purpose of surface treating and finishing materials. How surface treatments and finishing techniques are applied to a range of materials.</p> <p><b>Assessment-</b></p> <ol style="list-style-type: none"> <li>1)Paper engineering</li> <li>2) Folds, angles and stakeholders.</li> <li>3) 2D design</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. They will gain an understanding of expectations of GCSE's.</p>
YEAR 9 TERM 2	Sustainable living, water tower filtration unit- Workshop	<p><b>Knowledge-</b> Exploring the context, i.e. situation, primary user, stake holders, Sustainable living. Investigating existing products. Materials and components. 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	Come dine with me- Food	<p><b>Knowledge-</b> Food from different countries. Vegan and vegetarians- how animals are treated in the country. Sustainability. Food analysis and nutrition. Food hygiene and safety. Gelatinisation. Introduction to food science and the raising agents in food. 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.</p> <p><b>Skills -</b>Weigh and measure, pastry skills, knife skills, all in one method. Dough- kneading, proving, fermenting. Using a wok. Prepare ingredients and equipment, testing food. Knife skills, using the cooker/oven grill. Cooking methods, Combine, prepare and shape. Making sauces and doughs. 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) Main course dish planning.</li> <li>3) Presentation challenge- practical assessment.</li> </ol>	

Year / term	Unit of work	Core Knowledge and skills Year 9- OPTION	Intent and Skills of Year 9
YEAR 9 TERM 1	<b>Inclusive design, ergonomic pen modelling.</b> Graphics	<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 choice and more about food provenance. They will be given further opportunities to develop their expertise at designing their own recipes to allow for dietary needs and design their own recipes. 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 TERM 2	<b>Mechanical engineering-</b> Workshop based module devised by MBA.	<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. How jigs, templates and patterns are used in production manufacture 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)Levers</li> <li>2) Gears</li> <li>3) Designers.</li> </ol>	
YEAR 9 TERM 3	<b>Food and the environment-</b> Food based module devised by CCO.	<p><b>Knowledge</b>- Product analysis, field to fork, food labelling, moral, social, ethical and medical choice. Food from different countries, sustainability, food analysis and nutrition. Food hygiene. Dietary needs. Look at the role of a celebrity chef. Selecting a recipe.</p> <p><b>Skills</b>- Weigh and measure, pastry skills, knife skills, how to shape a burger. How to make pasta from scratch. Cake decorating skills. Presentation skills. 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 labelling.</li> <li>2) Product development cheesecake.</li> <li>3) High risk food safety sheet.</li> </ol>	

