

KS3 Design and Technology



Soar Valley College

A SPECIALIST MATHS AND COMPUTING COLLEGE

KS3 Design & Technology Curriculum Mapping

Core Knowledge Key:

Research

Processes

Designing

Making

Evaluation

National Curriculum Links	Year 7	Year 8	Year 9
<p>Use research and exploration, such as the study of different cultures, to identify and understand user needs.</p>	<ul style="list-style-type: none"> Plastic maze game Sweet dispenser Sock toy Food and nutrition <p>Using research to generate a concept and explain key design ideas. Designing products relating to target markets, discussing topics such as age and gender stereotypes.</p> <ul style="list-style-type: none"> Design suitability, intended users and target audience. Client feedback Interviews 	<ul style="list-style-type: none"> Mechanisms Electronic speaker box Textile phone pillow and Day of the Dead themed fabric keyring Food and nutrition <p>Able to build on ideas for a product based on research. User centred products focusing on influential designers, cultures and research.</p> <ul style="list-style-type: none"> Design suitability, intended users and target audience. Client feedback Specifications Cultural designers 	<ul style="list-style-type: none"> Pop-up card Metal flower Electronic wooden lamp Textile-based safety product Food and nutrition <p>Produce an outcome based on research from homework and knowledge. User centred products are created, focusing on influential designers, cultures and individual research. Using a cultural focus for designing and comparisons.</p> <ul style="list-style-type: none"> Design suitability, intended users and target audience. Life cycle assessment Specification Cultural celebrations
<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>Design work shows a confident understanding of all elements including rendering. Ideas are innovative and drawn with confidence. Some challenging images will be attempted in 3D. Simple annotation is evident throughout.</p> <ul style="list-style-type: none"> Isometric drawing Graphic labelling Packaging Rendering (timbers, textiles, baseline & plastics) 	<p>Design work shows challenge with accurate rendering. Ideas are innovative and drawn with high quality. More challenging images will be drawn in 3D moving away from 2D. Annotation is thorough and evident throughout.</p> <ul style="list-style-type: none"> Isometric drawing Rendering 2D Design (CAD) and sublimation printing Design Ideas 	<p>Design work shows challenge with tone and accuracy in rendering. Ideas are innovative and drawn with high quality. Imagery will be drawn in 3D with high accuracy. Annotation is thorough and evident throughout. Design fixation is avoided and a level of CAD is used where appropriate.</p> <ul style="list-style-type: none"> Isometric drawing Rendering Paper templates Google Sketchup Design Ideas
<p>Understand and use the properties of materials and the performance of structural elements to achieve functioning solutions.</p>	<p>Understand how to shape and manipulate timbers, fabrics and plastic.</p> <ul style="list-style-type: none"> Properties of timbers (hardwoods & softwoods) Structure of fabrics Polymers – thermosetting & thermoplastics Joining methods of timbers 	<p>Independently cut and mark out timber, plastic and fabric. Mastering their function and correct usage.</p> <ul style="list-style-type: none"> Uses of timbers (hardwoods, softwoods & manufactured boards) Finishes applied to timbers How fabrics can be joined Polymers – uses in industry Joining methods of timbers 	<p>New handling and manipulation of materials to include metals and papers + boards along with building on knowledge and retrieval of timbers, plastic and fabrics.</p> <ul style="list-style-type: none"> Uses of timbers (hardwoods, softwoods, manufactured boards) Finishes applied to timbers Creation of an independent textile product Polymers – uses in industry Joining methods of timbers
<p>Select from and use specialist tools, techniques, processes, equipment and machinery precisely.</p>	<p>Able to use a variety of materials and techniques with confident skill. New terminology for some tools and materials should be used. The students will learn how to be safe and need very little support in using and storing the equipment.</p> <p>New skills and knowledge taught through demonstration of:</p> <ul style="list-style-type: none"> Hand tools Joining methods of polymers Pillar drill Belt sander Sewing needle Sewing machine Vacuum former 	<p>Know a variety of materials and the correct techniques that can be used with confident skill. The correct terminology for all tools and materials is used. Student can be safe and independent in using the equipment</p> <p>More complex use of:</p> <ul style="list-style-type: none"> Hand tools Fret saw and belt sander Pillar drill Files / sanding – finishes Sewing machine and needle Sublimation printer Heat press Vacuum former Symbol recognition Understand and develop independence using soldering irons and printed circuit boards Laser cutting 	<p>Explore a variety of materials and techniques available to them and use them with highly exceptional skill. The correct terminology for all tools and materials will be used. Independence is needed in using the equipment and storing it.</p> <p>Competent use of the following:</p> <ul style="list-style-type: none"> Hand tools Fret saw and belt sander Pillar drill Sewing machine Iron Embroidery machine Laser cutting Stains and sanding blocks Independent use of soldering irons and printed circuit boards
<p>Identify and solve their own design problems and understand how to reformulate problems given to them. Including the use of CAD / CAM.</p>	<p>Use a design brief with a given specification to help tackle a problem. Computer Aided Design (CAD) is used to help resolve problems and create an outcome with support. A Computer Aided Manufacturing (CAM) method is also integrated in to the curriculum.</p> <ul style="list-style-type: none"> Design creation on a laptop Laser cut outcome Graphics packaging 	<p>A design brief with a specification given to help tackle a problem. Computer Aided Design (CAD) is independently used to help resolve the problem. A new Computer Aided Manufacturing (CAM) method is also integrated in to the curriculum.</p> <ul style="list-style-type: none"> Design creation on a laptop Laser cut outcome Sublimation printing 	<p>More challenging design briefs and specifications are given to help tackle a problem. Computer Aided Design (CAD) programs are used independently to help resolve problems and create an outcome which avoids design fixation.</p> <ul style="list-style-type: none"> Google Sketchup for schools Laser cut outcome Graphics product made with 3D element

<p>Investigate new and emerging technologies.</p> <p>Use a variety of approaches to cover biomimicry, UCD and avoid fixation or stereotypes.</p>	<p>Biomimicry is explored along with user centre designs produced.</p> <ul style="list-style-type: none"> • Biomimicry drawn into designs 	<p>New and emerging technologies are explored.</p> <ul style="list-style-type: none"> • Biomimicry drawn into designs 	<p>New and emerging technologies are explored. Iteration is used to encourage progression and avoid fixation.</p> <ul style="list-style-type: none"> • Smart and modern textiles.
<p>Select from and use a wider, more complex range of materials taking into account their properties.</p> <p>-Understand developments in DT, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists.</p>	<p>Understand simple implications of materials in use.</p> <ul style="list-style-type: none"> • 6R's • Environment and deforestation • Environment – material origins (timbers and plastics) • Material classifications / groups 	<p>Understand wider implications of materials in use and their uses.</p> <ul style="list-style-type: none"> • 6R's • Environment and deforestation • Material classifications / groups 	<p>Selecting materials to best suit the need of a problem taking into account their properties and uses.</p> <ul style="list-style-type: none"> • Life cycle assessment • Environment and deforestation • Environment effects • Smart and modern materials • Material classifications / groups
<p>Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups.</p>	<p>Knowledge has been added to work and students can analyse, review, incorporate and justify research through simple evaluation sentences. Analysis with some modifications. There is evidence of understanding the importance of accuracy and comments made on areas for improvement.</p> <ul style="list-style-type: none"> • Refining outcome with objective or brief. Looking for modifications 	<p>Analyse, review, incorporate and justify the research through evaluation. There is evidence of fully understanding the importance of accuracy and how to achieve this together with its impact on the quality of outcome. Knowledge is shared well alongside how to improve.</p> <ul style="list-style-type: none"> • Reviewing and refining outcome against a brief • Writing in full sentences 	<p>Prior knowledge is used to analyse, review, incorporate and justify their research through evaluation; going beyond the task set. Students can suggest modifications to work, and written work is fluent. All work is exemplary. Knowledge is shared confidently and can lead others in the class.</p> <ul style="list-style-type: none"> • Reviewing and refining outcome against objectives • Peer assessment • Using PASS and ABC with correct terminology
<p>Health and Safety.</p>	<p>Handheld plastic maze game – fusion glue, craft knives, guillotine, vacuum former, laser cutter Sweet Dispenser – Tenon saw, Pillar drill, belt sander, centre punch, engineers square, screwdriver, PVA glue Textile sock toy – needle, pins, sewing machine, fabric shears</p>	<p>Mechanisms – Scroll saw, files, coping saw Spinning top – tenon saw, files, bench hook Electronic speaker box – Tenon Saw, soldering iron, belt sander, PVA glue Textile phone holder and 'Day of the Dead' key ring – needle, pins, sewing machine, fabric shears, heat press</p>	<p>Pop up card – Laminator, guillotine, craft knives Metal rose – Centre punch, scribe, tap and die, tin snips, files, pillar drill, brazing hearth, enamel paint Electronic wooden Lamp – Soldering iron, scroll saw, tenon saw, wood oil and paints Textile safety product – needle, pins, sewing machine, fabric shears, embroidery machine, iron</p>

KS3 Food Curriculum Mapping

Nutrition and Health

Food Preparation and Cooking

Food Knowledge

National Curriculum Links	Year 7	Year 8	Year 9
- Understand and apply the principles of nutrition and health	<p>Understand the basics of nutrition and the function of these foods in the body as well as the diet.</p> <ul style="list-style-type: none"> The Eatwell Guide and food groups Government eight healthy eating guidelines Nutritional function of foods - Macronutrients and micronutrients Nutrition and the link to health 	<p>Understand the importance of the macronutrients, their functions, types and sources. Alongside the impact of an excess or deficiency of the macronutrients.</p> <ul style="list-style-type: none"> Dietary requirements and the importance of the macronutrients Nutritional function of ingredients and alternatives that can be used Excesses and deficiencies of the macronutrients Allergies and intolerances 	<p>Understand the function of ingredients within a dish and the impact on sensory characteristics – taste, texture, aroma and appearance.</p> <ul style="list-style-type: none"> Dietary requirements and the importance of micronutrients – vitamins and minerals Nutritional analysis of individual ingredients used in a dish Sensory characteristics- how these can work together to impact a dish
- Cook a repertoire of predominantly savoury dishes so that they are able to feed themselves and others a healthy and varied diet	<p>Practical lessons allow students to explore and make food from the different sections of the Eat Well Guide.</p> <p><i>Dishes – Fruit kebabs, cous cous salad, flatbreads, cheese scones.</i></p>	<p>Practical lessons allow students to explore the function of ingredients in action and make ingredient choices, so dishes suit their likes/needs.</p> <p><i>Dishes – Chocolate chip cookies, macaroni cheese, frittata, savoury rice.</i></p>	<p>Practical lessons allow students to explore a range of ingredients suitable for the dishes selected.</p> <p>Understand international cuisines use a variety of ingredients and cooking methods.</p> <p><i>Dishes – Sponge dish, international dish, bread dish.</i></p>
- Become competent in a range of cooking techniques for example, 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	<p>Understand the importance of safe and hygienic practices within a kitchen environment.</p> <ul style="list-style-type: none"> Safe working practices Personal Hygiene The 4 C's Knife and oven safety <p>Weighing, measuring, chopping, dicing, kneading, forming a dough, shaping, rubbing in, melting, using the oven and hob.</p>	<p>Understand the sensory characteristics of ingredients, the different methods of applying heat safely and how ingredients change when cooked.</p> <ul style="list-style-type: none"> Food Science - plasticity, caramelisation, gelatinisation, coagulation Selecting ingredients to season and flavour dishes Applying heat by baking, grilling, frying, boiling Safe use of electric whisk and cooking methods <p>Weighing, measuring, chopping, dicing, shaping, seasoning, electric whisk, sauce making skills, boiling, simmering, frying, sauteing, using the oven, hob and grill.</p>	<p>Use their aeration knowledge to produce dishes that use mechanical, chemical and biological raising agents.</p> <p>Use international cuisines as a base to explore the function and nutrition of key ingredients within a recipe.</p> <p>Show independence in planning and preparing for each food practical by modifying the recipe and ingredient choices.</p> <ul style="list-style-type: none"> Selecting ingredients to produces dishes independently Using more complex skills – dough making, aerated sponge, shaping, complex knife skills Safe and competent use of equipment and cooking methods Selecting ingredients with consideration to sensory characteristics and nutritional content. <p>Weighing, measuring, chopping, dicing, bread making skills, rolling, shaping, baking, use of oven and hob, appropriate cooking methods for international dish e.g. wok, presentation skills.</p>
- Understand the source, seasonality and characteristics of a broad range of ingredients.	<p>Understand where food comes from and how it has been produced.</p> <ul style="list-style-type: none"> Food Provenance - grown, caught and reared foods Seasonality of ingredients Different farming methods – intensive, organic, free range and fairtrade Food miles and where ingredients come from. 	<p>Understand the function and properties of ingredients and how foods are produced.</p> <ul style="list-style-type: none"> Macronutrients – sources of ingredients Food Science - plasticity, caramelisation, gelatinisation, coagulation Primary food production – wheat, sugar, milk Secondary food production – cheese, pasta 	<p>Understand the chemical properties and function of ingredients with a focus on aeration methods – mechanical, chemical and biological.</p> <p>Independently select ingredients based on their knowledge of nutrition, sensory characteristics and link to specific cuisine.</p> <ul style="list-style-type: none"> Apply knowledge of different aeration methods when producing dishes and recognise how this impacts the dish Independent selection of ingredients for each of their dishes chosen International Cuisines – understand that different ingredients are used in different cuisines and cultures Food choice – use knowledge of different food choices when modifying meals e.g. religion, diets, intolerances, likes and dislikes