

KEY STAGE 3: Design and Technology – Programmes of Study

		Year 7	Year 8	Year 9
Design	<i>Understanding contexts, users and purposes</i>	<ul style="list-style-type: none"> • Develop detailed design specifications to guide their thinking • Use research including the study of different cultures, to identify and understand user needs • Identify and solve their own design problems 		<ul style="list-style-type: none"> • Develop design specifications that include a wider range of requirements such as environmental, aesthetic, cost, maintenance, quality and safety • Research the health and wellbeing, cultural, religious and socio-economic contexts of their intended users • Understand how to reformulate design problems given to them
		<ul style="list-style-type: none"> • Work confidently within a range of relevant domestic, local and industrial contexts, such as the home, health, leisure, culture, engineering, manufacturing, construction, food, energy, agriculture and fashion • Consider the influence of a range of lifestyle factors and consumer choices when designing products • Take creative risks when making design decisions • Analyse where human values may conflict and compromise has to be achieved 		
	<i>Generating, developing, modelling and communicating ideas</i>	<ul style="list-style-type: none"> • Use 2D and begin to use 3D CAD packages to model their ideas • Produce models of their ideas 		<ul style="list-style-type: none"> • Use 3D CAD to model, develop and present their ideas • Use CAD and related software packages to validate their designs in advance of manufacture
		<ul style="list-style-type: none"> • Use specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations • Combine ideas from a variety of sources • Use a variety of approaches to generate creative ideas and avoid stereotypical responses • Decide which design criteria clash and determine which should take priority • Develop and communicate design ideas using annotated sketches • Produce 3D models to develop and communicate ideas • Give oral and digital presentations and use computer-based tools 		

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Make	<i>Planning</i>	<ul style="list-style-type: none"> produce ordered sequences and schedules for making products they design, detailing resources required produce costings using spreadsheets for products they design and make 		<ul style="list-style-type: none"> Create production schedules that inform their own and others' roles in the manufacturing of products they design Make simple use of planning tools, for instance Gant charts Communicate their plans clearly so that others can implement them Match and select suitable materials considering their fitness for purpose
		<ul style="list-style-type: none"> Select appropriately from specialist tools, techniques, processes, equipment and machinery Select appropriately from a wider, more complex range of materials, components and ingredients, taking into account their properties such as water resistance and stiffness 		
	<i>Practical skills and techniques</i>	<ul style="list-style-type: none"> Make use of specialist equipment to mark out materials Use a broad range of material joining techniques including stitching, mechanical fastenings, heat processes and adhesives Investigate and develop skills in modifying the appearance of materials including textiles and other manufactured materials e.g. dying and applique 		<ul style="list-style-type: none"> Adapt their methods of manufacture to changing circumstances Recognise when it is necessary to develop a new skill or technique
		<ul style="list-style-type: none"> Follow procedures for safety and hygiene and understand the process of risk assessment Use a wider, more complex range of materials, components and ingredients, taking into account their properties Use a broad range of manufacturing techniques including handcraft skills and machinery to manufacture products precisely Apply a range of finishing techniques, including those from art and design, to a broad range of materials including textiles, metals, polymers and woods 		
Evaluate	<i>Own ideas and product</i>	Year 7	Year 8	Year 9
		<ul style="list-style-type: none"> Evaluate their products against their original specification and identify ways of improving them. Actively involve others in the testing of their products 		<ul style="list-style-type: none"> Select appropriate methods to evaluate their products in use and modify them to improve performance

			<ul style="list-style-type: none"> Produce short reports, making suggestions for improvements
		<ul style="list-style-type: none"> Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups 	
	<i>Existing products</i>	<p>Investigate and analyse:</p> <ul style="list-style-type: none"> Products through disassembly to determine how they are constructed and function The positive and negative impact that products can have in the wider world 	<p>Investigate and analyse:</p> <ul style="list-style-type: none"> Products that they are less familiar with using themselves How products can be developed considering the concept of 'cradle to grave' The concept of circular economy approaches in relation to product development and consumption
		<ul style="list-style-type: none"> Investigate and analyse new and emerging technologies Know about an increasing range of designers, engineers, chefs, technologists and manufacturers and be able to relate their products to their own designing and making 	
Technical Knowledge	<i>Making products work</i>	<ul style="list-style-type: none"> Know how to classify materials by structure e.g. hard woods, soft woods, ferrous and non-ferrous, thermoplastic and thermosetting plastics Know about the physical properties of materials e.g. grain, brittleness, flexibility, elasticity, malleability and thermal Know how more advanced electrical and electronic systems can be powered and used in their products Know how to use simple electronic circuits incorporating inputs and outputs Know about textile fibre sources e.g. natural and synthetic and fabrics e.g. plain and woven Know how to select and modify patterns and use in textile construction 	<ul style="list-style-type: none"> Know how materials can be cast in moulds Know how to apply the concepts of feedback in systems Know how to control outputs such as actuators and motors Know how to make use of microcontrollers in products they design and manufacture themselves Know how to construct and use simple and compound gear trains to drive mechanical systems from a high revving motor
		<ul style="list-style-type: none"> Use learning from science to help design and make products that work Use learning from mathematics to help design and make products that work Understand the properties of materials, including smart materials, and how they can be used to advantage Understand the performance of structural elements to achieve functioning solutions Understand how more advanced mechanical systems used in their products enable changes in movement and force 	

		<ul style="list-style-type: none"> How to competently use a range of cooking techniques for example, selecting and preparing ingredients; using utensils and electrical equipment 		
Cooking and Nutrition	<i>Where food comes from</i>	Year 7	Year 8	Year 9
		<ul style="list-style-type: none"> Know how to compare the cost of food when planning to eat out or cook at home Know about the influence of food marketing, advertising and promotion on their own diet and purchasing behaviour 		
	<ul style="list-style-type: none"> Know that food is produced, processed and sold in different ways, e.g. conventional and organic farming, fair trade Know that people choose different types of food and that this may be influenced by availability, season, need, cost, where the food is produced, culture and religion 			
	<i>Food preparation, cooking and nutrition</i>	<ul style="list-style-type: none"> Know the importance of a healthy and varied diet as depicted in The eatwell plate and Eight tips for healthy eating Know that food provides energy and nutrients in different amounts; that they have important functions in the body; and that people require different amounts during their life Know how to taste and cook a broader range of ingredients and healthy recipes, accounting for a range of needs, wants and values Know how to actively minimise food waste such as composting fruit and vegetable peelings and recycling food packaging 		<ul style="list-style-type: none"> Know the importance of energy balance and the implications of dietary excess or deficiency, e.g. malnutrition, maintenance of a healthy weight Know how to use nutrition information and allergy advice panels on food labels to help make informed food choices Know how to use a broader range of preparation techniques and methods when cooking, e.g. stir-frying, steaming, blending Know how to modify recipes and cook dishes that promote current healthy eating messages Know the principles of cleaning, preventing cross-contamination, chilling, cooking food thoroughly and reheating food until it is steaming hot
<ul style="list-style-type: none"> Know how to store, prepare and cook food safely and hygienically Know how to use date-mark and storage instructions when storing and using food and drinks Know how to select and prepare ingredients Know how to use utensils and electrical equipment Know how to apply heat in different ways 				

		<ul style="list-style-type: none">• Know how to use taste, texture and smell to decide how to season dishes and combine ingredients• Know how to adapt and use their own recipes• Cook a repertoire of predominantly savoury dishes to feed themselves and others a healthy and varied diet
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