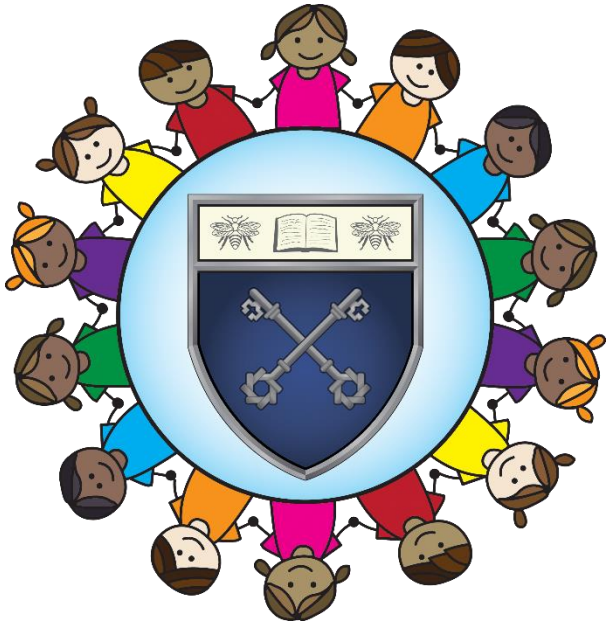
Design and Technology Curriculum



Substantive and Disciplinary Knowledge

Our Design and Technology curriculum provides pupils with an understanding of both substantive and disciplinary knowledge.

Substantive knowledge- (know what) - this is the subject knowledge and explicit vocabulary used to learn about the content of each unit of work. The carefully sequenced, factual knowledge that we learn through our curriculum.

Substantive knowledge in design and technology is based on the knowledge of four key elements of the process of design (design, make, evaluate and technical knowledge). All of these elements will be taught from Year 3 to Year 6 and vocabulary is taught explicitly and will be deliberately practised and applied through the 4 key elements.

Disciplinary knowledge– (know how) - their knowledge about *how* designers investigate existing products/ designs and *how* they design and produce their own products. Disciplinary knowledge is taught by giving children the opportunity to explore existing products evaluating these before making their own improved product. It is through this disciplinary knowledge that pupils will steadily become more expert by thinking like a designer.

Substantive Knowledge

Concepts	Year 3	Year 4	Year 5	Year 6
Cooking and Nutrition	• To understand that food has to be grown, reared and caught in the UK, Europe and the wider world • To begin to know about seasonality and where ingredients come from • To know how to identify talk about which foods are healthy and which are not	• To know that a healthy diet is made up from a variety and balance of different foods • To know where and how a variety of ingredients are grown, reared or caught	• To understand seasonallity, where ingredients come from, how they are reared, caught or grown • To know that recipes can be adapted to change the appearance, taste, texture and aroma	• To understand and apply the principles of a healthy and varied diet and demonstrate this through project design • To know where and how a variety of ingredients are grown, reared, caught and processed
Vocabulary	name of products, names of equipment, utensils, techniques and ingredients, texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, cook, fresh, savoury, hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet yeast, dough, flour, wholemeal	name of products, names of equipment, utensils, techniques and ingredients, texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, cook, fresh, savoury, hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet, yeast, dough, flour, wholemeal	ingredients, bran, flour, wholemeal, unleavened, baking soda, spice, herbs fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble	ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality, utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble
Generating ideas Design	• To understand the purpose of a design criteria • To know the three key aims for a design criteria (**something** for **someone** for some **purpose**)	• To know the fundamentals of creating a design (features – diagram with labels) • To begin to use computers to aid design	• To understand computing applications that support design	• To understand how key events and individuals in Design & Technology helped to shape the world • To know how to programm a computer to monitor

				changes in the environment and control their products
Make	• To know how to make freestanding structures stronger, stiffer and more stable	• To understand purposes of different tools and utensils	• To understand purposes of a wider range of tools	• To know purposes and practicalities of a wider range of tools
Evaluate	• To begin to know about inventors, designers, engineers, chefs and manufacturers • To understand how to evaluate • To understand and use lever and linkage mechanisms	• To begin to know about inventors, designers, engineers, chefs and manufacturers • To understand how to evaluate constructively	• To understand how key events and individuals in Design & Technology helped to shape the world • To understand how to evaluate constructively	• To understand how key events and individuals in design and technology have helped shape the world • To understand how to evaluate constructively and suggest improvements for others
Technical Knowledge	• To understand how to make strong, stiff structures • To understand that machines and mechanisms allow us to use a smaller force to have a greater effect and change motion	• To know how to join materials in different ways • To use electrical systems in their product for example series circuits, switches, bulbs and motors • To understand that an electrical system is a group of parts (components) that work together to transport electricity around a circuit. • To understand common features of an electric product (switch, battery or plug, dials, buttons etc.). • To understand that an electric product uses an electrical system to work (function). • To know the name and appearance of a bulb, battery, battery holder and crocodile wire to build simple circuits.	• To use knowledge of existing products to design his/her functional product • To understand computing to program, monitor and control their products • To know how mechanical systems such as cams, pulleys or gears create movement	• To understand some different ways to reinforce structures. • To understand how triangles can be used to reinforce bridges. • To know that properties are words that describe the form and function of materials. • To understand why material selection is important based on properties. • To understand the material (functional and aesthetic) properties of wood.

				• To understand computing to program, monitor and control their products
Vocabulary	Plan, investigate, design, make, weak, strong, cut fold, structure, user, purpose, product, function, evaluate, join, fix, framework, base, slider, lever, pivot, , label, model, appealing, criteria, scoring, assemble, mechanism, prototype, annotate, design brief, net, accuracy, adhesives, linkage, input, process, output	plan, investigate, design, make, weak, strong, cut fold, structure, user, purpose, product, function, evaluate, join, fix, framework, base, slider, lever, pivot , label, model, appealing, criteria, scoring, assemble, mechanism, prototype, annotate, design brief, net, accuracy, adhesives, linkage, input, process, output, mock-up, specification, innovative, sensory, graphics, font, reinforce, line	Plan, investigate, design, make, weak, strong, cut fold, structure, user, purpose, product, function, evaluate, join, fix, framework, base, slider, lever, pivot, , label, model, appealing, criteria, scoring, assemble, mechanism, prototype, annotate, design brief, net, accuracy, adhesives, linkage, input, process, output, mock-up, specification, innovative, sensory, graphics, font, reinforce, linear, rotary, oscillating, innovative, authentic, stiffen, transmit, strengthen, temporary, permanent, stability, rotation, spindle, drive belt, gear, pulley	Plan, investigate, design, make, weak, strong, cut fold, structure, user, purpose, product, function, evaluate, join, fix, framework, base, slider, lever, pivot, , label, model, appealing, criteria, scoring, assemble, mechanism, prototype, annotate, design brief, net, accuracy, adhesives, linkage, input, process, output, mock-up, specification, innovative, sensory, graphics, font, reinforce, linear, rotary, oscillating, innovative, authentic, stiffen, transmit, strengthen, temporary, permanent, stability, rotation, spindle, drive belt, gear, pulley, budget,

Disciplinary Knowledge				
Concepts	Year 3	Year 4	Year 5	Year 6
Cooking and Nutrition	• Talk about the different food groups and name foods from each group • To prepare ingredients safely and hygienically • To apply knowledge of a healthy and varied diet	• To begin to prepare and cook a variety of predominantly savoury dishes ,safely and hygenially, using a range of cooking techniques • To measure ingredients using scales and follow a recipe • To apply growing knowledge of a healthy and varied diet	• To prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques • To measure accurately and calculate ratios of ingredients to scale up from a recipe	• To confidently prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques • To measure accurately to the nearest gram and calculate ratios of ingredients to scale up from a recipe
Design	• To use knowledge of existing products to design his/her functional product. • To follow a design criteria • To generate and develop ideas through annotated sketches and prototypes • To make drawings with labels when designing	• To begin to gather information about the needs and wants of particular individuals and groups • To begin to develop their own design criteria • To generate and develop realistic ideas using a range of strategies eg prototypes, annotated sketches and pattern pieces focusing on the needs of the user • To use annotated sketches to indicate design features of their products that will appeal to the intended user	• To communicate, generate, develop and model ideas using a range of strategies eg computer-aided-design, cross-sectional and exploded diagrams • To begin to use research to inform design and generate own design criteria focusing on the needs of the user • To develop a design for a functional, appealing and fit for purpose product aimed at a specific audience	• To use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at a particular individual or group. • To communicate, generate, develop and model ideas using a range of strategies eg computer-aided-design, cross-sectional and exploded diagrams • To use presentation to describe in depth the purpose of a product and explain how it meets the needs of the intended user.

Make	• To begin to measure, markout, cut, join and combine materials • To select from and use a wide range of tools and equipment to perform practical tasks eg cut, shape, join and finish • To refine work and techniques as work progresses, continually evaluating the product design	• To measure, markout, cut, join and combine materials with some accuracy • To select from and use a wide range of tools, equipment, materials and components accurately • To refine work and techniques as work progresses, continually evaluating the product design and suggesting improvements	• To accurately measure, markout, cut, join and combine materials and apply a range of finishing techniques • To select from and use a range of tools and equipment to perform practical tasks for example, cutting, shaping, joining and finishing	• To accurately measure, markout, cut, join and combine materials and apply a range of finishing techniques • To make high quality products/ prototypes, select from and use a wide range of tools, equipment, materials and components accurately according to their functional properties and aesthetic qualities, • To construct more complex structures by applying a range of strategies in order to solve real/relevant problems.
Evaluate	• To evaluate a range of finished products. • To evaluate own ideas and designs against design criteria and consider the views of others to improve their work	• To evaluate a range of existing products that address real/relevant problems • To evaluate own ideas and designs against design criteria and others' work suggesting improvements and consider the views of others to improve their work	• To evaluate a range of existing products in a range of relevant contexts eg culture, industry • To generate own design criteria and evaluate ideas and products against these • To investigate and analyse a range of existing products that address real/relevant problems, in a range of relevant contexts	• To identify the strengths and areas for development in their ideas and products. • To consider the views of others, including intended users, to improve their work. • To critically evaluate the quality of design, manufacture and fitness for purpose of their product. • To recognise several designers and manufacturers who have been influential in the design and technology industries.

				• To consider the impact and innovative qualities of their products
Technical Knowledge	• To begin to make strong, stiff structures exporing how they can be made stronger, stiffer and more stabe. • To begin to apply principles of a healthy, varied diet when preparing savoury dishes using a range of cooking techniques • To explore and use mechanisms	• To use knowledge of existing products to design his/her functional product • To join textles in different ways • To to use electrical components and link scientific knowledge by using lights, switches or buzzers	• To link scientific knowledge to design by using pulleys and gears • To know how to use more complex IT programs to enhance the quality of a product	• To use knowledge to improve a made product by strengthening, stiffening or reinforcing • To know how to use electrical systems correctly and accurately to enhance a given product • To know which IT program would further enhance a product