

DESIGN TECHNOLOGY PROGRESSION MAP – KS2

STATUTORY COVERAGE KS2

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].

When designing and making, pupils should be taught to:

Design

- use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups
- generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Make

- select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately
- select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

Evaluate

investigate and analyse a range of existing products

- evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- understand how key events and individuals in design and technology have helped shape the world

Technical knowledge

- apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
- understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
- apply their understanding of computing to program, monitor and control their products.

Cooking and nutrition

As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.

Pupils should be taught to:

- understand and apply the principles of a healthy and varied diet
- prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques
- understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.

Y3	Y4	Y5	Y6
Food Healthy and varied diet (AUT) <ul style="list-style-type: none"> • Generate ideas and develop design criteria for an appealing product for a user and purpose. • Plan the main stages of a recipe, listing ingredients, utensils and equipment. • Select from a range of ingredients to make appropriate food products. • Carry out and record evaluations of a variety of ingredients and products. • Know a range of appropriate ingredients, and whether they are grown, reared or caught. 	Structures Shell structures using computer-aided design (CAD) (AUT) <ul style="list-style-type: none"> • Generate ideas and designs, developing them through analysis of shell structures and use CAD to model and communicate ideas. • Plan the making and use appropriate tools and software, explaining their choices. Use computer-generated finishing techniques. • Evaluate shell structures and their own products. • Develop knowledge of nets of cubes and cuboids and more complex 3D shapes and how to construct strong, stiff shell structures. 	Food Celebrating culture and seasonality (AUT) <ul style="list-style-type: none"> • Generate and explore innovative ideas through research and discussion to develop a design brief. • Write a step-by-step recipe, including a list of ingredients, equipment and utensils. • Using appropriate utensils and equipment accurately, make, decorate and present a food product for the intended user and purpose. • Evaluate a range of relevant products and ingredients and the final product with reference to the design brief and specification. • Understand seasonality and the source of different food products. 	Food Celebrating culture and seasonality (AUT) <ul style="list-style-type: none"> • Generate and explore innovative ideas through research and discussion to develop a design brief. • Write a step-by-step recipe, including a list of ingredients, equipment and utensils. • Using appropriate utensils and equipment accurately, make, decorate and present a food product for the intended user and purpose. • Evaluate a range of relevant products and ingredients and the final product with reference to the design brief and specification. • Understand seasonality and the source of different food products.
Textiles 2-D shape to 3-D product (AUT) <ul style="list-style-type: none"> • Generate design criteria for an appealing, functional product for specific users. • Produce annotated sketches, prototypes, final product sketches and pattern pieces. • Select fabrics and fastenings according to their functional characteristics. • Investigate a range of 3-D textile products. • Test their product against the original criteria and with the intended user. 	Electrical Systems Simple programming and control (SPR) <ul style="list-style-type: none"> • Gather information and develop and communicate realistic design ideas using annotated sketches and prototypes. • Connect simple electrical components in a series circuit and program an interface to enhance the way the product works. • Investigate and analyse a range of powered products, including programmed, and evaluate their own products and design criteria. • Understand and use computing to program and control products with electrical systems. 	Structures Frame structures (AUT) <ul style="list-style-type: none"> • Research user needs and existing products and develop and model innovative ideas into a design specification. • Formulate a plan with a step-by-step list of tasks and resources. • Use tools to accurately measure, mark out, cut, shape and join materials to make frameworks. • Use finishing techniques suitable for the product and critically evaluate their products against a range of criteria. • Research key events and individuals relevant to frame structures. 	Textiles Using computer-aided design (CAD) in textiles (AUT) <ul style="list-style-type: none"> • Generate innovative ideas through research and develop these using mock-ups and prototypes including using computer-aided design. • Design functional, appealing products for the intended user that are fit for purpose based on a simple design specification. • Select and use a range of tools and equipment, including CAD, to make products that are accurately assembled and well finished. • Work within the constraints of time, resources and cost.
Structures Shell structures (SPR) <ul style="list-style-type: none"> • Generate and develop realistic ideas and design criteria collaboratively and through analysis of existing products. 	Electrical Systems Monitoring and control (SPR) <ul style="list-style-type: none"> • Develop a design specification for a product that responds automatically to 	Mechanical Systems Pulleys or gears (SPR)	Structures Frame structures (SPR) <ul style="list-style-type: none"> • Research user needs and existing products and develop and model

<ul style="list-style-type: none"> • Order the stages of making; selecting tools and using with some accuracy. • Investigate and evaluate shell structures, and construct strong, stiff shell structures. • Test and evaluate own products against design criteria and intended user and purpose. 	<p>environmental changes in the environment.</p> <ul style="list-style-type: none"> • Generate and communicate ideas through annotated sketches and representations of electrical circuits or circuit diagrams. • Using a step-by-step plan, select and accurately assemble materials, electrical components, to produce a functional product. • Create and modify a computer control program to enable their electrical product to respond to changes in the environment. 	<ul style="list-style-type: none"> • Generate ideas through research and develop and communicate a simple design specification. • Select use a range of tools and equipment to make products that that are accurately assembled and well finished within the constraints of time, resources and cost. • Compare the final product to the original design specification and test the quality of the design, manufacture and functionality with the user. • Investigate famous manufacturing and engineering companies relevant to the project. 	<p>innovative ideas into a design specification.</p> <ul style="list-style-type: none"> • Formulate a plan with a step-by-step list of tasks and resources. • Use tools to accurately measure, mark out, cut, shape and join materials to make frameworks. • Use finishing techniques suitable for the product and critically evaluate their products against a range of criteria. • Research key events and individuals relevant to frame structures.
<p>Mechanical Systems Levers and linkages (SUM)</p> <ul style="list-style-type: none"> • Generate realistic ideas and use annotated sketches and prototypes to develop, model and communicate ideas. • Select and use tools with some accuracy to cut, shape and join paper and card. • Investigate and analyse their own and others' products with lever and linkage mechanisms. • Understand and use lever and linkages, and fixed and loose pivots. 	<p>Food Healthy and varied diet (SUM)</p> <ul style="list-style-type: none"> • Generate ideas and develop design criteria for an appealing product for a user and purpose. • Plan the main stages of a recipe, listing ingredients, utensils and equipment. • Select from a range of ingredients to make appropriate food products. • Carry out and record evaluations of a variety of ingredients and products. • Know a range of appropriate ingredients, and whether they are grown, reared or caught. 	<p>Textiles Combining different fabric shapes (SUM)</p> <ul style="list-style-type: none"> • Generate and communicate innovative ideas through research. • Produce detailed lists of equipment and fabrics and formulate step-by-step plans for making. • Investigate and analyse textile products linked to their final product and compare the final product to the original design specification. • Know that a 3-D textile product can be made from a combination of pattern pieces, fabric shapes and different fabrics and that fabrics can be strengthened, stiffened and reinforced. 	<p>Electrical Systems More complex switches and circuits (SUM)</p> <ul style="list-style-type: none"> • Develop a design specification for a functional product that responds automatically to changes in the environment. • Formulate a step-by-step plan to making, listing tools, equipment, materials and components. • Use a computer control program to enable an electrical product to work automatically in response to changes in the environment. • Test and evaluate the system to demonstrate its effectiveness for the intended user and purpose. • Know and use technical vocabulary relevant to the project.
	<p>Mechanical Systems Pneumatics (SUM)</p> <ul style="list-style-type: none"> • Generate their own realistic ideas and use annotated sketches and prototypes to develop, model and communicate ideas. • Select and use tools with some accuracy, cut and join materials and 	<p>Mechanical Systems Cams (SUM)</p> <ul style="list-style-type: none"> • Generate a design from research; develop a specification, model and communicate ideas. • Produce lists of tools and materials and plans to make accurately assembled and well finished products within constraints. 	<p>Electrical Systems Monitoring and control (SUM)</p> <ul style="list-style-type: none"> • Develop a design specification for a product that responds automatically to environmental changes in the environment.

	<p>components such as tubing, syringes and balloons.</p> <ul style="list-style-type: none">• Investigate and find information on and products with pneumatic mechanisms and evaluate their own products and ideas against criteria and user needs.• Understand and use pneumatic mechanisms.	<ul style="list-style-type: none">• Compare final product to the original specification; test products with the intended user and critically evaluate the product, considering the views of others.• Investigate famous manufacturing and engineering companies relevant to the project.	<ul style="list-style-type: none">• Generate and communicate ideas through annotated sketches and representations of electrical circuits or circuit diagrams.• Using a step-by-step plan, select and accurately assemble materials, electrical components, to produce a functional product.• Create and modify a computer control program to enable their electrical product to respond to changes in the environment.
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