

Nansledan School DT and Engineering Progression of Skills

Our Vision and Aims

Design and Technology is a subject where children's capability in designing and making is developed through combining their designing and making skills with knowledge and understanding. At Nansledan school we view Design and Technology as a subject which allows children to apply their knowledge and understanding in a creative way to design and make products.

Their work in DT will include elements of engineering. Children will be taught about this field of work and given time to develop their ideas and approaches to finding solutions to real-life problems through invention. In every year group the DT and Engineering curriculum consists of a theme-based approach to learning that is firmly rooted upon teaching of skills that are progressive. These themes are appropriate for the interest levels and stages of the pupils, yet flexible enough to allow for the academic rigor needed to challenge the most able.

EYFS National Curriculum Expectations

Expressive Arts and Design (Exploring and Using Media and Materials)

Children safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.

Physical Development (Moving and Handling)

Children handle equipment and tools effectively, including pencils for writing.

Expressive Arts and Design (Being Imaginative)

Children use what they have learnt about media and materials in original ways, thinking about uses and purposes. They represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories.

Key Stage 1 National Curriculum Expectations

Design

Pupils should be taught to:

- design purposeful, functional, appealing products for themselves and other users based on design criteria.
- generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.

Make

Pupils should be taught to:

- select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing].
- select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics.

Evaluate

Pupils should be taught to:

- explore and evaluate a range of existing products.
- evaluate their ideas and products against design criteria.

Technical Knowledge

Pupils should be taught to:

- build structures, exploring how they can be made stronger, stiffer and more stable.
- explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.

Cooking and Nutrition

Pupils should be taught to:

- use the basic principles of a healthy and varied diet to prepare dishes.
- understand where food comes from.

Key Stage 2 National Curriculum Expectations

Design

Pupils should be taught to:

- 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

Pupils should be taught to:

- 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

Pupils should be taught to:

- 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

Pupils should be taught to:

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

Designing

Designing	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Understanding contexts, users and purposes	Children design purposeful, functional, appealing products for themselves, and other users based on design criteria. <ul style="list-style-type: none"> Work confidently within a range of contexts such as imaginary, story-based, home, school, gardens, playgrounds, local community and the wider environment. State what products they are designing and making. Say whether their products are for themselves or other users. Describe what their products are for. Say how their products will work. Say how they will make their products suitable for intended users. Use simple design criteria to help develop their ideas. 	Children 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. <ul style="list-style-type: none"> Work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment. Describe the purpose of their products. Indicate the design features of their products that will appeal to intended users. Explain how particular parts of their products work. 	
		<ul style="list-style-type: none"> Gather information about the needs and wants of particular individuals and groups. Develop their own design criteria and use these to inform their ideas. 	<ul style="list-style-type: none"> Carry out research, using surveys, interviews, questionnaires and web-based resources. Identify the needs, wants, preferences and values of particular individuals and groups. Develop a simple design specification to guide their thinking.
Generating, developing, modelling and communicating ideas.	They generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology. <ul style="list-style-type: none"> Generate ideas by drawing on their own experiences. Use knowledge of existing products to come up with ideas. 	They generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer- aided design. <ul style="list-style-type: none"> Share and clarify ideas through discussion. Model their ideas using prototypes and pattern pieces. Use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas. Use computer-aided design to develop and communicate their ideas. 	

	<ul style="list-style-type: none"> • Develop and communicate ideas by talking and drawing. • Model ideas by exploring materials, components and construction kits and by making templates and mock-ups. • Use information and communication technology, where appropriate, to develop and communicate their ideas. 	<ul style="list-style-type: none"> • Generate realistic ideas, focusing on the needs of the user. • Make design decisions that take account of the availability of resources. 	<ul style="list-style-type: none"> • Generate innovative ideas, drawing on research. • Make design decisions, taking account of constraints such as time, resources and cost.
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Making

Making	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Planning	<ul style="list-style-type: none"> Plan by suggesting what to do next. Select from a range of tools and equipment, explaining their choices. Select from a range of materials and components according to their characteristics. 	<ul style="list-style-type: none"> Select tools and equipment suitable for the task. Explain their choice of tools and equipment in relation to the skills and techniques they will be using. Select materials and components suitable for the task. Explain their choice of materials and components according to functional properties and aesthetic qualities. 	
		<ul style="list-style-type: none"> Order the main stages of making. 	<ul style="list-style-type: none"> Produce appropriate lists of tools, equipment and materials that they need. Formulate step-by-step plans as a guide to making.
Practical skills and techniques	<ul style="list-style-type: none"> Follow procedures for safety and hygiene. Use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components. Measure, mark out, cut and shape materials and components. Assemble, join and combine materials and components. Use finishing techniques, including those from art and design. 	<ul style="list-style-type: none"> Follow procedures for safety and hygiene. Use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components. 	
		<ul style="list-style-type: none"> Measure, mark out, cut and shape materials and components with some accuracy. Assemble, join and combine materials and components with some accuracy. Apply a range of finishing techniques, including those from art and design, with some accuracy. 	<ul style="list-style-type: none"> Accurately measure, mark out, cut and shape materials and components. Accurately assemble, join and combine materials and components. Accurately apply a range of finishing techniques, including those from art and design. Use techniques that involve a number of steps. Demonstrate resourcefulness when tackling practical problems.

Evaluating

Evaluating	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Own ideas and products	<ul style="list-style-type: none"> • Talk about their design ideas and that they are making. • Make simple judgements about their products and ideas against design criteria. • Suggest how their products could be improved. 	<ul style="list-style-type: none"> • Identify the strengths and areas for development in their ideas and products. • Consider the views of others, including intended users, to improve their work. 	
		<ul style="list-style-type: none"> • Refer to their design criteria as they design and make. • Use their design criteria to evaluate their completed products. 	<ul style="list-style-type: none"> • Critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make. • Evaluate their ideas and products against their original design specification.
Existing products	<ul style="list-style-type: none"> • What products are. • Who products are for. • What products are for. • How products work. • How products are used. • Where products might be used. • What materials products are made from. • What they like and dislike about products. 	<ul style="list-style-type: none"> • How well products have been designed. • How well products have been made. • Why materials have been chosen. • What methods of construction have been used. • How well products work. • How well products achieve their purposes. • How well products meet user needs and wants. 	
		<ul style="list-style-type: none"> • Who designed and made the products. • Where products were designed and made. • When products were designed and made. • Whether products can be recycled or reused. 	<ul style="list-style-type: none"> • How much products cost to make. • How innovative products are. • How sustainable the materials in products are. • What impact products have beyond their intended purpose.
Key events and individuals	Not a requirement in KS1	Inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.	

Technical Knowledge

Technical Knowledge	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Making products work	<ul style="list-style-type: none"> About the simple working characteristics of materials and components. About the movement of simple mechanisms such as levers, sliders, wheels and axles. How freestanding structures can be made stronger, stiffer and more stable. That a 3-D textiles product can be assembled from two identical fabric shapes. That food ingredients should be combined according to their sensory characteristics. The correct technical vocabulary for the projects they are undertaking. 	<ul style="list-style-type: none"> How to use learning from science to help design and make products that work. How to use learning from mathematics to help design and make products that work. That materials have both functional properties and aesthetic qualities. That materials can be combined and mixed to create more useful characteristics. That mechanical and electrical systems have an input, process and output. The correct technical vocabulary for the projects they are undertaking. 	
		<ul style="list-style-type: none"> How mechanical systems such as levers and linkages or pneumatic systems create movement. How simple electrical circuits and components can be used to create functional products. How to make strong, stiff shell structures. That a single fabric shape can be used to make a 3-D textiles product. That food ingredients can be fresh, pre-cooked and processed. 	<ul style="list-style-type: none"> How mechanical systems such as cams or pulleys or gears create movement. How more complex electrical circuits and components can be used to create functional products. How to program a computer to monitor changes in the environment and control their products. How to reinforce and strengthen a 3-D framework. That a 3-D textiles product can be made from a combination of fabric shapes. That a recipe can be adapted by adding or substituting one or more ingredients.

Cooking and Nutrition

Cooking and Nutrition	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Where food comes from	<ul style="list-style-type: none"> That all food comes from plants or animals. That food has to be farmed, grown elsewhere (e.g. home) or caught. 	<ul style="list-style-type: none"> That a recipe can be adapted by adding or substituting one or more ingredients. That food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world. 	
		(see above)	<ul style="list-style-type: none"> That seasons may affect the food available. How food is processed into ingredients that can be eaten or used in cooking.
Food preparation, cooking and nutrition	<ul style="list-style-type: none"> How to name and sort foods into the five groups in the Eatwell Guide. That everyone should eat at least five portions of fruit and vegetables every day. How to prepare simple dishes safely and hygienically, without using a heat source. How to use techniques such as cutting, peeling and grating. 	<ul style="list-style-type: none"> How to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source. How to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking. 	
		<ul style="list-style-type: none"> That a healthy diet is made up from a variety and balanced of different food and drink, as depicted in the Eatwell Guide. That to be active and healthy, food and drink are needed to provide energy for the body. 	<ul style="list-style-type: none"> That recipes can be adapted to change the appearance, taste, texture and aroma. That different food and drink contain different substances – nutrients, water and fibre – that are needed for health.