



## **Frimley Church of England School**

### **Approach to DT**



#### **Purpose**

**DT** is a subject where we learn to design, create, experiment, test, improve and evaluate.

#### **Intent**

Through the teaching of DT, the aim is to improve children's engagement, creativity and provide them with opportunities to develop and extend their skills. All children will have the opportunity to express their individual ideas, thoughts and interests through a variety of mediums, equipment and resources. Children will become more confident artists and creators understanding that there is no 'wrong' result/outcome and develop resilience to improving their outcomes. They will learn more about different techniques and skills and have opportunities to practice these to become more confident inventors and creators of their own works of art and projects. Where possible activities will include child-choice and be child-led to develop creativity and independence further.

#### **Implementation**

Lessons are taught in blocks by the class or PPA teachers. Planning will follow a small step approach to mastery. Children will be influenced through enrichment, after school clubs and assemblies to provide further opportunity for creativity and child-led approaches. Lessons will be exciting and creative where children can explore their ideas through different mediums, equipment and resources in a supportive style of small-step learning to build confidence and more positive outcomes.

Class teachers will take photographs of the children's work and submit a selection half-termly to enable skills and knowledge progression to be monitored. Monitoring will also be through flip scrutiny, sketchbook scrutiny and pupil/staff voice. The curriculum overview will show progression in line with the approach document.

#### **Impact**

In classrooms you will see:

- Excitement, engagement and enthusiasm.
- Exploration of techniques and equipment.
- Children expressing their interests, ideas and thoughts with more confidence.
- Children will broaden and deepen their understanding in these areas and enjoy the varied creative opportunities.
- Evidence is collected through sketch books (where relevant) and photos (where appropriate).

Children will be able to:

- Become better creative risk takers.
- Become more resilient.
- Become more experimental and understand how to better their outcomes.
- Children will broaden and deepen their understanding in these areas and enjoy the varied creative opportunities.

Children leave Frimley:

- With a wide range of skills, knowledge and techniques
- Have the ability to express their own ideas, interests and thoughts on paper.
- With a confident approach to creative learning (being an individual).

Well equipped to plan and carry out creative learning and have developed their skills to achieve better outcomes

**National curriculum expectations:**

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].

**Pupils should be taught to:**

<b>Design</b>	<ul style="list-style-type: none"><li>• 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.</li><li>• generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.</li></ul>
<b>Make</b>	<ul style="list-style-type: none"><li>• select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately.</li><li>• 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</li></ul>
<b>Evaluate</b>	<ul style="list-style-type: none"><li>• investigate and analyse a range of existing products.</li><li>• evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.</li><li>• understand how key events and individuals in design and technology have helped shape the world.</li></ul>
<b>Technical language</b>	<ul style="list-style-type: none"><li>• apply their understanding of how to strengthen, stiffen and reinforce more complex structures.</li><li>• understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages).</li><li>• understand and use electrical systems in their products (for example, series circuits, switches, bulbs, buzzers and motors).</li><li>• apply their understanding of computing to program, monitor and control their products</li></ul>

**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.

## DT Long term plan

	Year 3	Year 4	Year 5	Year 6
Autumn 1	Landmarks (full project)	Landmarks (full project), Light up boxes using electrical circuits (part project)	Cams (part project)	Landmarks (full project)
Autumn 2	Cooking and Nutrition - Big Soup	Cooking and Nutrition - Big Soup	Cooking and Nutrition - Big Soup	Cooking and Nutrition - Big Soup
Spring 1				
Spring 2		Levers and Linkages (part project)	Moon buggy project with pulley and electrical component (full project)	
Summer 1	Gears (part project)			Digestion teaching model (part project)
Summer 2	Pneumatic Systems (part project)		Kites (part project)	Computing – program, monitor and control (part project)

## What Frimley offers to its pupils: (DT medium term plans)

		Year 3	Year 4	Year 5	Year 6
Autumn term	Knowledge	Landmarks (full project) <ul style="list-style-type: none"> <li>Begin to apply their understanding of how to strengthen, stiffen and reinforce simple structures</li> </ul>	Landmarks (full project) <ul style="list-style-type: none"> <li>Develop their understanding of how to strengthen, stiffen and reinforce more complex structures</li> </ul>	Cams (part project) <ul style="list-style-type: none"> <li><b>Understand how cams create movement.</b></li> </ul>	Landmarks (full project) <ul style="list-style-type: none"> <li><b>Confidently</b> apply their understanding of how to strengthen, stiffen and reinforce <b>complex structures</b>.</li> </ul>
		<u>Design</u> <ul style="list-style-type: none"> <li>Begin to research design ideas with support.</li> <li>Develop simple design criteria to inform the design of functional products that are fit for purpose.</li> <li>Share ideas through discussion.</li> <li>Begin to use sketches and diagrams.</li> </ul>	<u>Design</u> <ul style="list-style-type: none"> <li>Carry out research <b>gathering information about the needs and wants of particular individuals and groups</b>.</li> <li>Develop design criteria to inform the design of <b>innovative</b> and functional products that are fit for purpose.</li> <li>Develop their own design criteria and <b>use these to inform their ideas</b>.</li> <li>Share and <b>clarify</b> ideas through discussion.</li> <li>Model their ideas using <b>prototypes</b> and <b>pattern pieces</b>.</li> <li>Begin to use <b>annotated</b> sketches, cross-sectional drawings and diagrams.</li> </ul>		<u>Design</u> <ul style="list-style-type: none"> <li>Carry out research, using surveys, interviews, <b>questionnaires and web-based resources</b>.</li> <li>Identify the needs, wants, preferences and <b>values</b>.</li> <li>Develop a <b>detailed</b> design specification which can be justified with reasons.</li> <li><b>Recognise when their products have to fulfil conflicting requirements</b>.</li> <li>Generate innovative ideas, <b>drawing on research</b>.</li> <li>Make design decisions, taking account of constraints such as time, <b>resources and cost</b>.</li> <li>Use annotated sketches, drawings and diagrams, cross-sectional exploded diagrams, prototypes, <b>pattern pieces and computer-aided design</b>.</li> </ul>

		<b>Make</b> <ul style="list-style-type: none"> <li>Begin to select tools and equipment for the task.</li> <li>Measure, mark out, cut and shape, assemble, join and combine materials, with some accuracy.</li> </ul>	<b>Make</b> <ul style="list-style-type: none"> <li>Select from a range of tools and equipment <b>suitable for the task.</b></li> <li>Measure, mark out, cut and shape, assemble, join and combine materials accurately.</li> <li><b>Begin to apply modelled finishing techniques.</b></li> </ul>		<b>Make</b> <ul style="list-style-type: none"> <li><b>Explain their choice of materials/components according to their functional and aesthetic qualities.</b></li> <li>Measure, mark out, cut and shape <b>to the nearest mm.</b></li> <li>Assemble, join and combine materials <b>in a sensible order.</b></li> <li>Apply a range of finishing techniques, <b>including those from art and design.</b></li> </ul>
		<b>Evaluate</b> <ul style="list-style-type: none"> <li>Begin to investigate existing products; identifying who made them and when, what they like and dislike about them.</li> <li>Identify what they like and dislike about their products.</li> <li>Identify what is the same/different from their original design.</li> <li>Begin to consider the views of others.</li> </ul>	<b>Evaluate</b> <ul style="list-style-type: none"> <li>Investigate existing products; who made them and when, <b>materials used, method of construction, strengths and weaknesses.</b></li> <li>Identify <b>strengths and weaknesses of their own products.</b></li> <li>Identify whether they achieved their design criteria <b>and give reasons why/why not.</b></li> <li><b>Consider</b> the views of others, <b>including intended users.</b></li> </ul>		<b>Evaluate</b> <ul style="list-style-type: none"> <li>Investigate and analyse existing products; who made them, when and where, materials used, method of construction, whether products meet users' needs and wants, <b>how much they cost to make, how sustainable are the materials.</b></li> <li>Evaluate the quality, <b>manufacture and fitness for purpose of the product in detail</b> and refer to own design criteria when evaluating, suggesting ways to improve.</li> <li>Consider the views of others, including users to improve work.</li> </ul>
	<b>Crucial Learning</b>	<b>Design</b> <ul style="list-style-type: none"> <li><i>A diagram is a simple drawing showing the appearance, structure or workings of something.</i></li> </ul>	<b>Design</b> <ul style="list-style-type: none"> <li><i>Research is an investigation to establish facts and information.</i></li> <li><i>Innovative means to introduce new ideas, original and creative thinking.</i></li> <li><i>Design criteria are the precise goals that a project must achieve.</i></li> <li><i>A prototype is a first version from which other forms are developed.</i></li> <li><i>A pattern piece is a template.</i></li> <li><i>Annotated sketches combine text and sketches to illustrate ideas.</i></li> <li><i>Cross sectional drawings show what the inside of something looks like.</i></li> </ul>	<b>Technical language</b> <ul style="list-style-type: none"> <li><i>A cam is a rotating or sliding piece in a mechanical linkage used especially in transforming rotary motion into linear motion.</i></li> </ul>	<b>Design</b> <ul style="list-style-type: none"> <li><i>Research takes many forms.</i></li> <li><i>Design decisions must take account of constraints including time, resources and cost.</i></li> <li><i>Computer aided design is the use of computers to aid in the creation, modification, analysis or optimisation of a design.</i></li> </ul>
		<b>Make</b> <ul style="list-style-type: none"> <li><i>To measure is to work out the size or amount needed.</i></li> <li><i>To assemble is to fit together the separate parts.</i></li> <li><i>Stiffen is to make rigid.</i></li> </ul>	<b>Make</b> <ul style="list-style-type: none"> <li><i>Accurately means in a way that is correct and exact.</i></li> <li><i>Finishing techniques are used to help achieve a high quality finish.</i></li> <li><i>Strengthen is to make stronger.</i></li> </ul>		<b>Make</b> <ul style="list-style-type: none"> <li><i>Explaining is to give a reason and to justify.</i></li> <li><i>Functional is designed to be practical and useful.</i></li> </ul>

					<ul style="list-style-type: none"> <li><i>Aesthetic is used to talk about beauty or art.</i></li> <li><i>Reinforce is to strengthen and support with additional material.</i></li> </ul>
		<b>Evaluate</b> <ul style="list-style-type: none"> <li><i>Likes and dislikes are opinions that can support design.</i></li> </ul>	<b>Evaluate</b> <ul style="list-style-type: none"> <li><i>Investigate is to carry out research.</i></li> <li><i>Strengths are tasks or actions done well.</i></li> <li><i>Weaknesses are a disadvantage or fault.</i></li> </ul>		<b>Evaluate</b> <ul style="list-style-type: none"> <li><i>Sustainable means to fulfil the needs of current generations without compromising the needs of future generations.</i></li> </ul>
	<b>Knowledge</b>	<b>Cooking and Nutrition - Big Soup</b> <ul style="list-style-type: none"> <li>Identify foods that are healthy and unhealthy.</li> <li>Prepare and cook using simple cooking techniques modelled by a teacher.</li> <li>Begin to identify where food comes from.</li> </ul>	<b>Cooking and Nutrition - Big Soup</b> <ul style="list-style-type: none"> <li>Identify foods that are healthy and unhealthy and <b>begin to understand and name food groups.</b></li> <li>Prepare and cook using simple cooking techniques <b>with increasing independence.</b></li> <li><b>Identify</b> where and how a variety of ingredients are grown, reared, caught and processed.</li> </ul>	<b>Cooking and Nutrition - Big Soup</b> <ul style="list-style-type: none"> <li>Identify <b>food groups</b> and how these <b>help us maintain a healthy diet.</b></li> <li>Prepare and cook using <b>more complex</b> cooking techniques – <b>following a recipe.</b></li> <li><b>Measure accurately using the metric scale.</b></li> <li>Understand seasonality – identify when a variety of ingredients are grown.</li> </ul>	<b>Cooking and Nutrition - Big Soup</b> <ul style="list-style-type: none"> <li><b>Adapt and create recipes applying the principles of a healthy diet.</b></li> <li>Prepare and cook using more complex cooking techniques – follow recipes independently.</li> <li><b>Adapt a recipe using ratio.</b></li> <li>Measure accurately using the metric <b>and imperial scale.</b></li> </ul>
	<b>Crucial Learning</b>	<ul style="list-style-type: none"> <li><i>Healthy food is food that gives you all the nutrients you need to stay healthy, feel well and have plenty of energy.</i></li> <li><i>Unhealthy foods are food that are high in fat, sugar and calories.</i></li> <li><i>Prepare is to make something.</i></li> <li><i>Cooking is preparing by mixing, combining and heating ingredients.</i></li> <li><i>Food comes from a variety of places.</i></li> </ul>	<ul style="list-style-type: none"> <li><i>Food groups are collections of foods that are similar.</i></li> <li><i>Grown means natural development by increasing in size and changing physically.</i></li> <li><i>Reared is to bring up and care for until fully grown.</i></li> </ul>	<ul style="list-style-type: none"> <li><i>Maintain is to enable to continue.</i></li> <li><i>Healthy diet is a diet that maintains or improves overall health.</i></li> <li><i>A recipe is a set of instructions for preparing a particular dish.</i></li> <li><i>Accurately is in a way that is correct in all details.</i></li> <li><i>Metric scale is a system of measurement used.</i></li> <li><i>Seasonality of food refers to the times of year when a food is at its peak.</i></li> </ul>	<ul style="list-style-type: none"> <li><i>Adapt is to make something suitable for a (new) purpose.</i></li> <li><i>Ratio is the relationship between two amounts.</i></li> <li><i>Imperial scale is a system of measurement now mostly superseded by the metric system.</i></li> <li><i>Healthy diet is a diet that maintains or improves overall health.</i></li> </ul>
	<b>Knowledge</b>		Light up boxes using electrical circuits (part project)		
	<b>Crucial Learning</b>		<ul style="list-style-type: none"> <li><i>Electrical circuits provide a path that carries electricity.</i></li> </ul>		
	<b>Theology and vision links</b>	Explicit links to love and honesty when evaluating DT or using DT to represent/reflect beliefs. Love honesty and forgiveness when offering advice etc. Links to bible stories where appropriate e.g. Noah's Ark (boats), Moses basket etc.			
<b>Spring term</b>	<b>Knowledge</b>		Levers and Linkages (part project)  <b>Understand</b> how levers, linkages create movement.	Moon buggy project with pulley and electrical component (full project) <ul style="list-style-type: none"> <li><b>Begin to understand how pulleys and gears create movement.</b></li> </ul>	

				<ul style="list-style-type: none"> <li>Begin to understand and use electrical circuits incorporating switches and motors within products.</li> </ul>	
				<p><b>Design</b></p> <ul style="list-style-type: none"> <li>Carry out research, using <b>surveys and interviews</b>.</li> <li>Identify the needs, wants and <b>preferences</b> of particular individuals and groups.</li> <li>Develop a design <b>specification</b> to inform the design of innovative, functional and <b>appealing</b> products that are fit for purpose and <b>aimed at particular individuals or groups</b>.</li> <li>Generate innovative ideas.</li> <li><b>Make design decisions, taking account of constraints such as time.</b></li> <li><b>Use annotated sketches, drawings and diagrams, cross-sectional exploded diagrams.</b></li> </ul> <p><b>Make</b></p> <ul style="list-style-type: none"> <li><b>Produce lists of tools, equipment and materials they need, giving simple reasons for choices.</b></li> <li>Measure, mark out, cut and shape to <b>the nearest cm.</b></li> <li>Assemble, join and combine materials <b>following a method.</b></li> <li>Apply a range of finishing techniques.</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>Investigate and <b>analyse</b> existing products; who made them, when <b>and where</b>, materials used, method of construction, <b>whether products meet users' needs and wants, can the products be recycled/ reused?</b></li> <li><b>Evaluate the quality of their product in detail</b> and refer to their own design criteria when evaluating, <b>suggesting ways to improve.</b></li> <li>Consider the views of others, including intended users <b>to improve their work.</b></li> </ul>	
			<ul style="list-style-type: none"> <li><i>Levers are rigid bars resting on a pivot.</i></li> </ul>	<ul style="list-style-type: none"> <li><i>A pulley is a simple and manoeuvrable way to move large objects.</i></li> </ul>	

	Crucial Learning		<ul style="list-style-type: none"><li>A pivot is the central point on which a mechanism turns or oscillates.</li><li>Linkages are a collection of parts joined together to change or help movement.</li></ul>	<ul style="list-style-type: none"><li>A mechanical system is a device that changes movement in some way.</li><li>Electrical circuits provide a path that carries an electrical current</li></ul> <div>Design<ul style="list-style-type: none"><li>A survey is a research method used for collecting data.</li><li>Preference means a greater liking for one over others.</li><li>Design specification is a detailed document that sets out exactly what a product or a process should present.</li><li>Exploded diagrams show how a product can be assembled and how the separate parts fit together.</li></ul></div> <div>Make<ul style="list-style-type: none"><li>A method is a procedure for approaching something.</li><li>Finishing techniques are used to help achieve a high quality finish.</li><li>Reinforce is to strengthen and support with additional material.</li></ul></div> <div>Evaluate<ul style="list-style-type: none"><li>Analyse is to examine in detail.</li><li>Evaluate is to judge something's quality.</li><li>Improve is to make or become better.</li></ul></div>	
	Theology and vision links	Explicit links to love and honesty when evaluating DT or using DT to represent/reflect beliefs. Love honesty and forgiveness when offering advice etc. Links to bible stories where appropriate e.g. Noah's Ark (boats), Moses basket etc.			
Summer term	Knowledge	Gears (part project) <ul style="list-style-type: none"><li>Begin to understand how simple gears and pneumatic systems create movement.</li></ul>		Kites (part project) <ul style="list-style-type: none"><li>Develop their understanding of how to strengthen, stiffen and reinforce more <b>complex structures</b></li></ul>	Digestion teaching model (part project)
	Crucial Learning	<ul style="list-style-type: none"><li>A gear is a rotating part in a machine and it has teeth cut around the edge.</li></ul>			
	Knowledge	Pneumatic Systems (part project) <ul style="list-style-type: none"><li>Begin to understand how simple gears and pneumatic systems create movement.</li></ul>			Computing – program, monitor and control (part project) <ul style="list-style-type: none"><li>Apply knowledge of computing to control and monitor products</li></ul>

	Crucial Learning	<ul style="list-style-type: none"> <li>A pneumatic system is the use of pressurised air for mechanical motion.</li> </ul>			<ul style="list-style-type: none"> <li>Programs are designed, written and debugged to accomplish specific goals</li> </ul>
	Knowledge				Electrical circuits <ul style="list-style-type: none"> <li><b>Understand and use more complex</b> circuits with switches, bulbs buzzers and motors in products.</li> </ul>
	Crucial Learning				<i>Electrical circuits provide a path that carries an electrical current. These are used for a specific purpose.</i>
	Theology and vision links	Explicit links to love and honesty when evaluating DT or using DT to represent/reflect beliefs. Love honesty and forgiveness when offering advice etc. Links to bible stories where appropriate e.g. Noah's Ark (boats), Moses basket etc.			