St Helena's Church of England Primary School

Design and Technology Progression Framework

Purpose of study

Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

Aims

The national curriculum for design and technology aims to ensure that all pupils:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook

(National Curriculum)

Curriculum Overview

	KS1	LKS2	UKS2
Curriculum Statement	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, such as the home and school, gardens and playgrounds, the local community, industry and the wider environment.	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, such as the home, school, leisure, culture, enterprise, industry and the wider environment.	
Design	• 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.	• 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 range of tools and equipment to perform practical tasks such as 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.	• select from and use a wider range of tools and equipment to perform practical tasks, such as 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	• explore and evaluate a range of existing products. • evaluate their ideas and products against design criteria.	• 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	• build structures, exploring how they can be made stronger, stiffer and more stable. • explore and use mechanisms, such as levers, sliders, wheels and axles, in their products.	• apply their understanding of how to strengthen, stiffen and reinforce more complex structures. • understand and use mechanical systems in their products, such as gears, pulleys, cams, levers and linkages. • understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs, buzzers and motors. • apply their understanding of computing to programme, monitor and control their products.	
Cooking and Nutrition	• use the basic principles of a healthy and varied diet to prepare dishes. • understand where food comes from.	• 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.	
EYFS Understands that media can be combined to create new effects. Constructs with a purpose in mind, using a variety of resources. Uses simple tools and techniques competently and appropriately. Selects appropriate resources and adapts work where necessary. Selects tools and techniques needed to shape, assemble and join materials they are using. Children safely use and explore a variety of materials, tools and techniques, experimenting with design, form and function. Create simple representations of objects. Children use what they have learnt about media and materials in original ways, thinking about uses and purposes.			

Progression:

Design, Make, Evaluate

Strand	EYFS	Year 1/2	Year 3/4	Year 5/6
Design	*Select appropriate resources *Use gestures, talking and arrangements of materials and components to show design * Use contexts set by the teacher and myself *Use language of designing and making (join, build, shape, longer, shorter, heavier etc.)	* have own ideas and plan what to do next * explain what I want to do and describe how I may do it * explain purpose of product, how it will work and how it will be suitable for the user * describe design using pictures, words, models, diagrams, begin to use ICT * design products for myself and others following design criteria * choose best tools and materials, and explain choices * use knowledge of existing products to produce ideas	* use research for design ideas * show design meets a range of requirements and is fit for purpose *begin to create own design criteria *have at least one idea about how to create product and suggest improvements for design. * produce a plan and explain it to others *say how realistic plan is. *include an annotated sketch *make and explain design decisions considering availability of resources *explain how product will work * make a prototype *begin to use computers to show design.	* draw on market research to inform design * use research of user's individual needs, wants, requirements for design * identify features of design that will appeal to the intended user * create own design criteria and specification * come up with innovative design ideas *follow and refine a logical plan. *use annotated sketches, cross-sectional planning and exploded diagrams * make design decisions, considering, resources and cost * clearly explain how parts of design will work, and how they are fit for purpose * independently model and refine design ideas by making prototypes and using pattern pieces * use computer-aided designs

Strand	EYFS	Year 1/2	Year 3/4	Year 5/6
Make	*Construct with a purpose, using a variety of resources *Use simple tools and techniques *Build / construct with a wide range of objects *Select tools & techniques to shape, assemble and join *Replicate structures with materials / components *Discuss how to make an activity safe and hygienic *Record experiences by drawing, writing, voice recording *Understand different media can be combined for a purpose	*explain what I am making and why it fits the purpose *make suggestions as to what I need to do next. *join materials/components together in different ways *measure, mark out, cut and shape materials and components, with support. *describe which tools I'm using and why *choose suitable materials and explain choices depending on characteristics. *use finishing techniques to make product look good *work safely and hygienically	* select suitable tools and equipment, explain choices in relation to required techniques and use accurately *select appropriate materials, fit for purpose; explain choices * work through plan in order. * realise if product is going to be good quality * measure, mark out, cut and shape materials/components with some accuracy *assemble, join and combine materials and components with some accuracy *apply a range of finishing techniques with some accuracy	* use selected tools and equipment precisely *produce suitable lists of tools, equipment, materials needed, considering constraints * select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics * create, follow, and adapt detailed step-by-step plans *explain how product will appeal to audience; make changes to improve quality * accurately measure, mark out, cut and shape materials/components * accurately assemble, join and combine materials/components * accurately apply a range of finishing techniques * use techniques that involve a number of steps * be resourceful with practical problems

Strand	EYFS	Year 1/2	Year 3/4	Year 5/6
Evaluate	*Adapt work if necessary *Dismantle, examine, talk about existing objects/structures *Consider and manage some risks *Practise some appropriate safety measures independently *Talk about how things work *Look at similarities and differences between existing objects / materials / tools *Show an interest in technological toys *Describe textures	* describe what went well, thinking about design criteria * talk about existing products considering: use, materials, how they work, audience, where they might be used; express personal opinion *evaluate how good existing products are *talk about what I would do differently if I were to do it again and why	*refer to design criteria while designing and making *use criteria to evaluate product * begin to explain how I could improve original design *evaluate existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose * discuss by whom, when and where products were designed * research whether products can be recycled or reused * know about some inventors/designers/ engineers/chefs/manufacturers of ground-breaking products	*evaluate quality of design while designing and making; is it fit for purpose? * keep checking design is best it can be. *evaluate ideas and finished product against specification, stating if it's fit for purpose *test and evaluate final product; explain what would improve it and the effect different resources may have had *do thorough evaluations of existing products considering: how well they've been made, materials, whether they work, how they've been made, fit for purpose *evaluate how much products cost to make and how innovative they are *research and discuss how sustainable materials are *consider the impact of products beyond their intended purpose *discuss some key inventors/designers/ engineers/ chefs/manufacturers of ground-breaking products

Progression:

Technical Knowledge

Strand	EYFS	Year 1/2	Year 3/4	Year 5/6
Materials and Structures		*measure materials *describe some different characteristics of materials *join materials in different ways *use joining, rolling or folding to make it stronger *use own ideas to try to make product stronger	*measure carefully to avoid mistakes *attempt to make product strong *continue working on product even if original didn't work *make a strong, stiff structure	select materials carefully, considering intended use of the product, the aesthetics and functionality. *explain how product meets design criteria * reinforce and strengthen a 3D frame
Mechanisms		*use levers or slides *begin to understand how to use wheels and axles	*select most appropriate tools / techniques *explain alterations to product after checking it *grow in confidence about trying new / different ideas. *use levers and linkages to create movement *use pneumatics to create movement	*refine product after testing, considering aesthetics, functionality and purpose *incorporate hydraulics and pneumatics *be confident to try new / different ideas *use cams, pulleys and gears to create movement
Textiles		*measure textiles *join textiles together to make a product, and explain how I did it *carefully cut textiles to produce accurate pieces *explain choices of textile	*think about user when choosing textiles *think about how to make product strong * begin to devise a template *explain how to join things in a different way	think about user's wants/needs and aesthetics when choosing textiles *make product attractive and strong *make a prototype *use a range of joining techniques

		*understand that a 3D textile structure can be made from two identical fabric shapes.	*understand that a simple fabric shape can be used to make a 3D textiles project	*think about how product might be sold *think carefully about what would improve product *understand that a single 3D textiles project can be made from a combination of fabric shapes.
Food and Nutrition	*Begin to understand some food preparation tools, techniques and processes *Practise stirring, mixing, pouring, blending *Discuss how to make an activity safe and hygienic *Discuss use of senses *Understand need for variety in food *Begin to understand that eating well contributes to good health	*explain hygiene and keep a hygienic kitchen *describe properties of ingredients and importance of varied diet *say where food comes from (animal, underground etc.) *describe how food is farmed, home-grown, caught *draw eat well plate; explain there are groups of food *describe "five a day" *cut, peel and grate with increasing confidence	*explain how to be safe/hygienic *think about presenting product in interesting/ attractive ways *understand ingredients can be fresh, pre-cooked or processed *begin to understand about food being grown, reared or caught in the UK or wider world *describe eat well plate and how a healthy diet=variety / balance of food and drinks *explain importance of food and drink for active, healthy bodies *prepare and cook some dishes safely and hygienically *use some of the following techniques: peeling, chopping, slicing, grating, mixing, spreading, kneading and baking	*understand a recipe can be adapted by adding / substituting ingredients *explain seasonality of foods *learn about food processing methods *name some types of food that are grown, reared or caught in the UK or wider world *adapt recipes to change appearance, taste, texture or aroma. *describe some of the different substances in food and drink, and how they can affect health *prepare and cook a variety of savoury dishes safely and hygienically including, where appropriate, the use of heat source. *use a range of techniques confidently such as peeling,

				chopping, slicing, grating, mixing, spreading, kneading and baking.
Electrical Systems			*use simple circuit in product *learn about how to program a computer to control product. *incorporate switch into product *confidently use number of components in circuit *begin to be able to program a computer to monitor changes in environment and control product	

	KS1		LKS2		UKS2	
	Year A	**Year B**	**Year A**	**Year B**	**Year A**	**Year B**
Materials and Structures		- measure materials - describe some different characteristics of materials - join materials in different ways - use joining, rolling or folding to make it stronger - use own ideas to try to make product stronger	- apply their understanding of how to strengthen, stiffen and reinforce more complex structures	-	- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.	
Ideas and resources.		Tudor houses Christmas cards with moving parts	Moving models/cracking contraptions			
Why Here, Why Now?		At the start of the year the children are introduced to the great fire of London as a significant event in History. Having explored STEM activities in EYFS in a less structured way, the children have the opportunity to build upon these by implementing the	Building on KS1's simple constructions, LKS2 children will refine further their modelling of a 3D free-standing structure. Planning and evaluation will be a developing skill for young model makers.		This unit builds upon strengthening and reinforcing skills taught in LKS2. Children are expected to be able to be more independent and free thinking in problem solving with materials.	

		research, design, make and evaluate process (Tudor houses).				
Mechanisms	- use levers or slides - begin to understand how to use wheels and axles	- use levers or slides - begin to understand how to use wheels and axles	- select most appropriate tools / techniques - explain alterations to product after checking it - grow in confidence about trying new / different ideas. - use levers and linkages to create movement - use pneumatics to create movement	- select most appropriate tools / techniques - explain alterations to product after checking it - grow in confidence about trying new / different ideas. - use levers and linkages to create movement - use pneumatics to create movement		- Understand and use mechanical systems in their products, such as gears, pulleys, cams, levers and linkages. - Incorporate hydraulics and pneumatics.
Ideas and resources.		Moon buggies	Lighthouse Fairground ride	Shadow puppets and theatres		
Why Here, Why Now?		Having explored space in an abstract way in EYFS, children now have the opportunity to explore mechanisms through the D.T. process of making moon buggies. This links to our History unit learning about the	Building on KS1's simple constructions, LKS2 children will add a moving/working part to their model incorporating scientific elements of sound, light and forces.	Using the scientific knowledge of shadows and light, children will create a jointed, moving structure		This unit offers opportunities for children to explore mechanisms and relate it to their locality (Year B, Farming).

		significant individual Neil Armstrong.				
Textiles	- measure textiles - join textiles together to make a product, and explain how I did it - carefully cut textiles to produce accurate pieces - explain choices of textile - understand that a 3D textile structure can be made from two identical fabric shapes.		- think about user when choosing textiles - think about how to make product strong - begin to devise a template - explain how to join things in a different way understand that a simple fabric shape can be used to make a 3D textiles project	-	- think about user's wants/needs and aesthetics when choosing textiles - make product attractive and strong - make a prototype - use a range of joining techniques - think about how product might be sold - think carefully about what would improve product - understand that a single 3D textiles project can be made from a combination of fabric shapes.	
Ideas and resources.	Medieval tabards		Ancient use of weaving to make a fabric			
Why Here, Why Now?	Having explored the basic skills of threading and sewing in EYFS this is an opportunity to build		Having explored how the ancient civilisations make their fabric and building upon KS1 simple threading and		This unit builds upon the exploration of materials and textiles in LKS2 with a stronger emphasis on	

	upon pupils' learning by designing and making a coat of arms in our History unit 'Castles, Knights and Fairy tales'. The children measure, cut and join textiles together for their medieval tabards.		costume making, LKS2 children will learn about warp and weft threads and practise the skill of threading		product design as a business opportunity (links to PSHE). The unit also interweaves with the exploration of materials in science and embroidery in art.	
Food and Nutrition	- explain hygiene and keep a hygienic kitchen - describe properties of ingredients and importance of varied diet - say where food comes from (animal, underground etc.) - describe how food is farmed, home-grown, caught - draw eat well plate; explain there are groups of food - describe "five a day" - cut, peel and grate with increasing confidence	- explain hygiene and keep a hygienic kitchen - describe properties of ingredients and importance of varied diet - say where food comes from (animal, underground etc.) - describe how food is farmed, home-grown, caught - draw eat well plate; explain there are groups of food - describe "five a day" - cut, peel and grate with increasing confidence	- explain how to be safe/hygienic - think about presenting product in interesting/ attractive ways - understand ingredients can be fresh, pre-cooked or processed - begin to understand about food being grown, reared or caught in the UK or wider world - describe eat well plate and how a healthy diet=variety / balance of food and drinks			- 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.

			- explain importance of food and drink for active, healthy bodies - prepare and cook some dishes safely and hygienically - use some of the following techniques: peeling, chopping, slicing, grating, mixing, spreading, kneading and baking			
Ideas and resources.	African dish Fruit salad-Handa's surprise Bread Gingerbread Soup Grow and make using own produce	Bread Ice lollies Smoothies	Pizzas Toppings Healthy, balanced food plates Cutting foods up			
Why Here, Why Now?	Having explored healthy eating in EYFS, this is a good chance	This is a chance for children to build upon the EYFS new	This complements the science knowledge and understanding of a			This unit offers an opportunity to develop an understanding of

	for children to expand their prior knowledge. They develop their basic cutting and grating skills to become more confident. Having acquired a basic knowledge in EYFS of where food comes from, this is an opportunity for children to grow their own produce and make their own dish.	experiences of making bread independently. Children develop their bread making skills by using the D.T. process to make different types of bread.	healthy lifestyle, body and mind. Building on breadmaking skills, children consider healthy toppings for a pizza.			our locality (Lincolnshire/Farming). The unit links to the previous Science/Geography unit (South America) as children look at where food comes from (import/export) and seasonality. It builds on cooking techniques learned in LKS2 (Pizza Making eg) by explore more complex savoury dishes that require greater application of skill.
Electrical Systems			- understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs, buzzers and motors			- Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs, buzzers and motors
Ideas and resources.			Lighthouse Fairground ride			
Why Here, Why Now?			Whilst learning the scientific knowledge of electricity, the children will apply this to building a simple			This unit interweaves with science learning around electricity/light. It builds upon LKS2

			circuit using a bulb, motor and switch for their model- making			learning but demands deeper thinking, more independence and a more complex understanding of key vocabulary and concepts.