Progression in Design Technology
at St Michael's CE Primary School

DESIGN TECHNOLOGY

National Curriculum Expectations

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 history 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.

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Statutory and Non-Statutory Frameworks:

EYFS		KS1		LKS2		UKS2	
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Early years foundation stage (EYFS) statutory framework	Early years foundation stage (EYFS) statutory framework	**National Curriculum** 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 and school, gardens and playgrounds, the local community, industry and the wider environment].		**National Curriculum** 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 and school, gardens and playgrounds, the local community ,industry and the wider environment]. When designing and making, pupils should be taught to: design, make, evaluate and develop technical knowledge.			

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Statutory Framework for the early years foundation stage ELG: Expressive arts and design • Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. • Share their creations, explaining the process they have used. • Make use of props and materials when role playing characters in narratives and stories.	When designing and making, pupils should be taught to: design, make, evaluate and develop technical knowledge.

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Our Design Technology curriculum will allow children to develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world. Children will 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. They will critique, evaluate and test their ideas and products and the work of others and understand and apply the principles of nutrition and learn how to cook.

Big Ideas

Design

Make

Evaluate

Technical Knowledge

Cooking and Nutrition

'Good buildings come from good people, and all problems are solved by good design'

Stephen Gardiner (Architect)

'Food is much more than sustenance. Food is love'

Nadiya Hussain (Baker)

Links with other subjects

English
- High quality texts
- Vocabulary and non-fiction writing
- Reasoning and inference

Maths
- Number, measuring, direction, handling data

Pedagogy
- Low stakes quizzing for long term memory
- Varied teaching and learning activities
- Thoughtful sequencing of content
- Specific teaching of vocabulary
- Higher order thinking tasks

Progress
- Units of work are carefully sequenced so prior knowledge and concepts are built upon
- Regular formative assessment and assessment for learning (including low-stakes quizzing) ensures gaps are filled
- Effective questioning and higher order thinking features in every lesson
- Progress and attainment within units is recorded and shared with all teaching staff

Support

For staff:
- National Curriculum
- Subject associations – DATA
- Knowledge organisers

For Pupils:
- Ambitious targets
- Quality first planning and teaching to meet all needs
- Guidance from individual support plans
- Texts / resources chosen which are accessible

		• Opportunities are provided for revisiting content or applying learning at greater depth.	• Children requiring support do not miss the same lesson every week

Long term plan over a 2-year cycle:

Year A September 2020 and then September 2022

	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
EYFS	**Make** Explore how things work and develop ideas and manipulate materials Homes for the three little pigs		**Tools** Develop use of tools for a variety of tasks (Stanley's Stick)		**Food** Making healthy choices An Italian meal	
KS1	**Mechanisms** Moving Pictures		**Structures** Freestanding structures (Sci/Computing)		**Food** Preparing fruit and vegetables (including cooking and nutrition requirements for KS1) Healthy pirate sandwiches (DT)	
LKS2	**Structures** Packaging		**Food** Healthy and varied diet (including cooking and nutrition requirements for KS2) Design a brand of tea		**Textiles** 2-D shape to 3-D product Anglo-Saxon purses (Hist/Art))	
UKS2	**Structures** Bridges		**Mechanical Systems** Pulleys or gears Mountain cable cars (Geog)		**Electrical Systems** More complex switches and circuits (including programming, monitoring and control) (Science)	

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Year B September 2021 and then 2023

	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
EYFS	**Tools** Develop use of tools for a variety of tasks		**Make** Explore how things work and develop ideas and manipulate materials Sea creature textile collage		**Food** Making healthy choices	
KS1	**Mechanisms** Wheels and axles Great fire of London Fire engines (Hist)		**Food** Preparing fruit and vegetables (including cooking and nutrition requirements for KS1) Balanced Scottish shortbread		**Textiles** Templates and joining techniques Chinese dragon puppets	
LKS2	**Mechanical Systems** Levers and linkages Steam boats (Hist)		**Food** Celebrating culture and seasonality (including cooking and nutrition requirements for KS2) American Food		**Electrical Systems** Simple circuits and switches (including programming and control) (Sci)	
UKS2	**Textiles** Combining different fabric shapes (including computer-aided design) Historical Hats (Hist)		**Food** Celebrating culture and seasonality (including cooking and nutrition requirements for KS2) Chocolate Enterprise Challenge (Hist/Computing)		**Food** Healthy and varied diet (including cooking and nutrition requirements for KS2) Cooking a savoury meal (rationing) (Hist)	

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Skills Progression	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 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 the language of designing and making (join, build, shape, longer, shorter, heavier etc.)	* have own ideas * explain what I want to do *explain what my product is for, and how it will work * use pictures and words to plan * design a product for myself following design criteria *research similar existing products	*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	*begin to research others' needs * show design meets a range of requirements * describe purpose of product * follow a given design criteria * have at least one idea about how to create product * create a plan which shows order, equipment and tools *describe design using an accurately labelled sketch and words * make design decisions *explain how product will work * make a prototype * begin to use computers to show design	*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 a product and suggest improvements for design. * produce a plan and explain it to others *say how realistic the 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.	*use internet and questionnaires for research and design ideas *take a user's view into account when designing * begin to consider needs/wants of individuals/groups when designing and ensure product is fit for purpose *create own design criteria * have a range of ideas *produce a logical, realistic plan and explain it to others. *use cross-sectional planning and annotated sketches * make design decisions considering time and resources. *clearly explain how parts of product will work. *model and refine design ideas by making prototypes	* 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

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						and using pattern pieces. *use computer-aided designs	model and refine design ideas by making prototypes and using pattern pieces * use computer-aided designs
		Design **End of Key Stage 1 Expectations** *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		**Design** **End of Key Stage 2 Expectations** *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 compute raided design		
Make	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	*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	*explain what I'm making and why *consider what I need to do next *select tools/equipment to cut, shape, join, finish and explain choices *measure, mark out, cut and shape, with support *choose suitable materials and explain choices *try to use finishing techniques to	*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	*select suitable tools/equipment, explain choices; begin to use them accurately * select appropriate materials, fit for purpose. * work through plan in order *consider how good product will be * begin to measure, mark out, cut and shape materials/components with some accuracy * begin to assemble, join and combine	*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 a 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/equipment with good level of precision * produce suitable lists of tools, equipment/materials needed *select appropriate materials, fit for purpose; explain choices, considering functionality * create and follow detailed step-by-step plan * explain how product will appeal to an audience * mainly accurately	* 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

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	safe and hygienic *Record experiences by drawing, writing, voice recording *Understand different media can be combined for a purpose	make product look good *work in a safe and hygienic manner	choices depending on characteristics. *use finishing techniques to make product look good *work safely and hygienically	materials and components with some accuracy * begin to apply a range of finishing techniques with some accuracy		measure, mark out, cut and shape materials/components *mainly accurately assemble, join and combine materials/components * mainly accurately apply a range of finishing techniques * use techniques that involve a small number of steps * begin to be resourceful with practical problems	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
		Make **End of Key Stage 1 Expectations** *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		**Make** **End of Key Stage 2 Expectations** *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	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	*Adapt work if necessary *Dismantle, examine, talk about existing objects/structures *Consider and manage some	*talk about my work, linking it to what I was asked to do * talk about existing products considering: use,	*describe what went well, thinking about design criteria * talk about existing products considering: use, materials, how they work, audience, where they might be	* look at design criteria while designing and making *use design criteria to evaluate finished product * say what I would change to make	*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	*evaluate quality of design while designing and making *evaluate ideas and finished product against specification, considering purpose and appearance.	*evaluate quality of design while designing and making; is it fit for purpose? *keep checking design is the best it can be. *evaluate ideas and finished product

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	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	materials, how they work, audience, where they might be used *talk about existing products, and say what is and isn't good * talk about things that other people have made *begin to talk about what could make product better	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	design better *begin to evaluate existing products, considering: how well they have been made, are they strong enough, materials, whether they work, how they have been made, fit for purpose * begin to understand by whom, when and where products were designed * learn about some inventors/designers/ engineers/chefs/ manufacturers of ground breaking products	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	*test and evaluate final product * evaluate and discuss existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose * begin to evaluate how much products cost to make and how innovative they are *research how sustainable materials are *talk about some key inventors/designers/ engineers/ chefs/manufacturers of ground breaking products	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

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		Evaluate **End of Key Stage 1 Expectations** *Explore and evaluate a range of existing products *Evaluate their ideas and products against design criteria	**Evaluate** **End of Key Stage 2 Expectations** *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

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Technical knowledge – Materials /structures		*begin to measure and join materials, with some support *describe differences in materials *suggest ways to make material/product stronger	*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	*use appropriate materials *work accurately to make cuts and holes * join materials *begin to make strong structures	*measure carefully to avoid mistakes *attempt to make products strong *continue working on a product even if original didn't work *make a strong, stiff structure	*select materials carefully, considering intended use of product and appearance *explain how product meets design criteria *measure accurately enough to ensure precision *ensure product is strong and fit for purpose *begin to reinforce and strengthen a 3D frame	*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 using different types of truss.
		Technical Knowledge **Materials/Structures** **End of Key Stage 1 Expectations** *Build structures, exploring how they can be made stronger, stiffer and more stable		**Technical Knowledge** **Materials/Structures** **End of Key Stage 2 Expectations** *Apply their understanding of how to strengthen, stiffen and reinforce more complex structures			

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	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Technical knowledge - Mechanisms		*begin to use levers or slides	*use levers or slides *begin to understand how to use wheels and axles	*select appropriate tools / techniques *alter product after checking, to make it better *begin to try new/different ideas *use simple lever and linkages to create movement *begin to try and strengthen a structure.	*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 *begin to try strengthen and stiffen a structure..	*refine product after testing *grow in confidence about trying new/ different ideas *begin to use cams, pulleys or gears to create movement *apply understanding of how to strengthen, stiffen and reinforce a structure.	*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 **apply understanding of how to strengthen, stiffen and reinforce a more complex structure.
		Technical Knowledge Mechanisms End of Key Stage 1 Expectations *Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.		**Technical Knowledge Mechanisms End of Key Stage 2 Expectations** *Understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)			
	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

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Technical knowledge - Textiles		*measure, cut and join textiles to make a product, with some support *choose suitable 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.	*join different textiles in different ways *choose textiles considering appearance and functionality *begin to understand that a simple fabric shape can be used to make a 3D textiles project	*think about the end 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 and aesthetics when choosing textiles *use own template * think about how to make product strong and look better *think of a range of ways to join things *begin to understand that a single 3D textiles project can be made from a combination of fabric shapes	*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.
		Technical Knowledge Textiles End of Key Stage 1 Expectations *Explore and use textiles in their products.		**Technical Knowledge Textiles End of Key Stage 2 Expectations** *choose and manipulate textiles to suit the product.			
Technical knowledge – Food and nutrition	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	*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	*describe textures *wash hands & clean surfaces *think of interesting ways to decorate food *say where some foods come from, (i.e. plant or	*explain hygiene and keep a hygienic kitchen *describe properties of ingredients and importance of varied diet *say where food	*carefully select ingredients *use equipment safely *make product look attractive *think about how to grow plants to use in cooking	*explain how to be safe/hygienic *think about presenting product in interesting/ attractive ways *understand	*explain how to be safe / hygienic and follow own guidelines *present product well - interesting, attractive, fit for purpose *begin to understand	understand a recipe can be adapted by adding / substituting ingredients *explain seasonality of foods *learn about food processing methods *name some types of

	variety in food *Begin to understand that eating well contributes to good health	animal) *describe differences between some food groups (i.e. sweet, vegetable etc.) *discuss how fruit and vegetables are healthy *cut, peel and grate safely, with support	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	*begin to understand food comes from UK and wider world *describe how healthy diet - variety/balance of food/drinks *explain how food and drink are needed for active/healthy bodies. *prepare and cook some dishes safely and hygienically *grow in confidence using some of the following techniques: peeling, chopping, slicing, grating, mixing, spreading, kneading and baking	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,	seasonality of foods *understand food can be grown, reared or caught in the UK and the wider world *describe how recipes can be adapted to change appearance, taste, texture, aroma *explain how there are different substances in food / drink needed for health *prepare and cook some savoury dishes safely and hygienically including, where appropriate, use of heat source * use range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking.	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.

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					kneading and baking		
		Technical Knowledge Food & Nutrition End of Key Stage 1 Expectations *Use the basic principles of a healthy and varied diet to prepare dishes *Understand where food comes from.		**Technical Knowledge Food & Nutrition End of Key Stage 2 Expectations** *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.		
Technical knowledge – Electrical systems	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				*use simple circuit in product *learn about how to program a computer to control product.	*use number of components in circuit *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	*use different types of circuit in product * think of ways in which adding a circuit would improve product * program a computer to monitor changes in environment and control product
				Technical Knowledge Electrical Systems End of Key Stage 2 Expectations *Understand and use electrical systems in their products for example, series circuits			

Promoting SMSC and British Values in Design Technology

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Spiritual	Moral	Social	Cultural
• Reflecting on products and inventions, the diversity of materials and ways in which design can improve the quality of our lives • Evaluation of products – does it meet the criteria – self and peer review and reflection	• Awareness of the moral dilemmas created by technological advances • Use of sustainable materials	• Opportunities to work as a team recognising others' strengths, sharing equipment. • Make healthy choices in designing menus.	• How different cultures have contributed to Technology.

Democracy	The Rule of Law	Individual Liberty	Respect	Tolerance of those with different faiths
○ Group work and enquiry ○ Allocating roles in group work ○ Turn taking and safe use of equipment ○ Valuing the contribution of others	○ Safety in DT ○ Tolerance of other's work and their views about our products in evaluation ○ Use of 'constructive criticism'	○ Children are taught that when working as a group people may hold different opinions about an idea. ○ They are encouraged to learn skills in tolerance and compromise where necessary.	○ Pupils are encouraged to reflect their own work and each other's' work which promotes respect and tolerance of different work and styles. ○ Pupils are taught how to respond to the work of others, taking into	○ Respect for products and practices from other countries and cultures

			account the impact of their words.	