

Design Technology

Progression of Skills and Knowledge

Document



The Design Technology at Moorfield

Believe, Achieve, Succeed

Introduction:

The purpose of this document is to outline the approach and method that has been adopted to implement the Design and Technology curriculum at Moorfield. It sets out what we aim to achieve and the knowledge and understanding that we have apportioned to each class and key stage. The decisions made have been done so by reference to the school's Mission Statement, the staff and Governing Body's vision for the future of our school. This document summarises the organisation of the Design and Technology curriculum and the school's method of securing children's entitlement to essential knowledge and skills to equip them for the next stage of their education and for later life.

Aims

- To ensure standards remain high and English and Maths is taught discretely
- To ensure reading remains a high priority
- To utilize the rich resource and history of our local community of Irlam
- To support our school's values and ethos
- To ensure pupils leave as 'well rounded' and confident individuals
- To ensure the wider sports curriculum and the arts are a key focus

Curriculum End Points

- By the time our designer leave us in year 6 we want them to
- Be able to design and make products that solve real and relevant problems within a variety of contexts.
- Have broad subject knowledge and make links to mathematics, science, engineering, computing and art.
- Are inspired by engineers, designers, chefs and architects and are able to create a range of structures, mechanisms, textiles, electrical systems and food products with a real life purpose.

Intent

All teaching of DT should follow the design, make and evaluate cycle. The design process should incorporate real life, relevant contexts to give meaning to learning. While making, children should be given choice and a range of tools to choose freely from. To evaluate, children should be able to evaluate their own products against a design criteria. Key skills and key knowledge have been mapped across the school to ensure progression between year groups. This also ensures that there is no overlap and each year group is aware of the skills that need to be built upon from the previous year. The medium term planner states what each year group is teaching and how each element from the curriculum fits into the topic. We also use the scheme of work 'Projects on a Page' which identifies progression of skills across the key stages. In year 3 the children complete a DT activity based on their topic 'Our Local Area'. They learn about the canal systems, The Manchester Ship Canal and design and make a structure to go across the canal.

DT is taught to a high standard, where each of the stages of the DT curriculum are given equal weight. DT is taught in a block therefore all children are required to complete each aspect of the curriculum before completing their product. All children are included in DT lessons regardless of their needs.

Knowledge and skills Moorfield wants our pupils to achieve at each stage:

Early Years Foundation Stage

During the EYFS pupils explore and use a variety of media and materials through a combination of child initiated and adult directed activities.

KS1

Design: Children are able to use appropriate planning formats to design purposeful products.

Make: Children are able to select and use a wide range of tools and materials that are suitable to make their product.

Evaluate: Children are able to evaluate their own and existing products against a criteria.

Technical Knowledge: Children are able to build and then improve different structures and explore and use various mechanisms.

Cooking and Nutrition: Children will understand where food comes from and will be able to prepare a healthy, balanced dish.

KS2

Design: Children are able to use research about a product to generate their own designs, recording these designs using various methods.

Make: Children are able to accurately select and use the correct tools required in order to make their product.

Evaluate: Children are able to investigate and analyse a range of products taking into consideration the opinions of others. Children understand the importance of inventors and the impact they have had on the world.

Technical Knowledge: Children are able to use technology and various systems whilst making their products.

Cooking and Nutrition: Children will be able to use a range of cooking tools to make and prepare savoury dishes and understand where we get our ingredients from.

Implementation

DT staff meetings have been delivered by the DT coordinator, who also attends CDP on what makes a good subject leader.

The subject is taught through discrete, (occasionally with a cross curricular link to the current topic) meaningful lessons. Children are taught through the three phases of designing, making and evaluating their own products. Each year group focuses on 2/3 topics throughout the year and each topic will focus on a separate set of skills. As children progress through the school, they are presented with opportunities to develop these skills, as they are revisited and built upon.

During DT lessons teachers use questioning to assess children's understanding of what has been taught throughout the lesson and any misconceptions are acknowledged, addressed and explained. In DT lessons, many cross-curricular links are observed. For example Maths links, during cooking topics, where children are measuring out ingredients, as well as calculating the quantities of different recipes. Instructions are often created as part of the 'design' phase, which has a direct link to English. Science knowledge is practiced when children are creating products that contain electrical components.

DT is taught using cross curricular links to the topic that is being taught. Therefore skills are transferred from one lesson to another and used multiple times in order to embed this knowledge into the children's long term memory.

Assessment of children's learning in Design Technology is an ongoing monitoring of children's understanding, knowledge and skills by the class teacher throughout lessons. This assessment is then used to inform differentiation, support and challenge required to support the children.

Summative assessment is conducted by class teachers across each year group, using target tracker. This is used to inform the subject leader/teacher of progress or skills and knowledge still to be embedded.

Impact

We ensure that children develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world. Pupils 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 and critique, evaluate and test their ideas and products and the work of others.

They understand and apply the principles of nutrition and learn how to cook. Children design and make a range of products. A good quality finish is expected in all design and activities made, appropriate to the age and ability of the child.

DT Long Term Plan						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery	Describe the texture of things, use various construction materials, construct, stack blocks vertically and horizontally, making enclosures and creating spaces, joins construction pieces together to build and balance, Use tools for a purpose					
Reception	Explore what happens when they mix colours, experiment to create different textures, understand that different media can be combined to create new effects, manipulates materials to achieve a planned effect, create simple representations of events, people and objects, and choose particular colours to use for a purpose.					
Year 1	Bonfire moving picture POP - Mechanisms	Play equipment designs POP- structures		Fruit Kebabs POP- Food		Animal Habitats POP- structures
Year 2		Design and make a healthy snack- link to science POP- Food	Recycled/ upcycled fabrics POP- Textiles			Geography: Our Design and make a mode of transport POP - Mechanisms
Year 3	Enterprise Week	Baking and Nutrition POP- Food	Catapults POP Mechanisms pneumatics	Board Games – Think Forward POP Mechanisms	Build a bridge to go over a canal POP- Structures Link to key events and	

				levers and linkages	individuals in design and technology who have helped shape the world	
Year 4	POP- Electrical systems	Christmas Product POP- Textiles	Enterprise Week	Board Games – Think Back POP Mechanisms levers and linkages	Cooking POP - Food	
Year 5	Tribal Huts POP - Structures		Viking Bread Baking POP- Food		Moving Toys linked to Victorians POP -Mechanical systems pulleys or gears/ cams Link to key events and individuals in design and technology who have helped shape the world	
Year 6	Mayan Chocolate Wrappers / package POP- Textiles Link to key events and individuals in design and technology who have helped shape the world				Periscopes POP - Electrical systems Link to science	

Skills and content coverage

National Curriculum Content – Design & Technology				
Early Years	Design and Technology			
	Exploring Media and Materials			
30- 50 mths	<p>Uses various construction materials.</p> <p>Beginning to construct, stacking blocks vertically and horizontally, making enclosures and creating spaces.</p> <p>Joins construction pieces together to build and balance.</p> <p>Realises tools can be used for a purpose.</p>			
40- 60 mths	<p>Manipulates materials to achieve a planned effect.</p> <p>Constructs with a purpose in mind, using a variety of resources.</p> <p>Uses simple tools and techniques competently and appropriately.</p> <p>Selects appropriate resources and adapts work where necessary.</p> <p>Selects tools and techniques needed to shape, assemble and join materials they are using.</p>			
KS1	Coverage	Autumn	Spring	Summer
	NC Skills	<p>Pupils should develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world</p> <p>They should 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</p> <p>They should critique, evaluate and test their ideas and products and the work of others</p> <p>They should understand and apply the principles of nutrition and learn how to cook.</p> <p>Pupils should be taught how to cook and apply the principles of nutrition and healthy eating.</p>		
Y1	NC Content	<p>Bonfire Moving Pictures select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]</p> <p>Play equipment designs</p>	<p>Fruit Kebabs use the basic principles of a healthy and varied diet to prepare dishes</p> <p>understand where food comes from.</p>	<p>Gaudi buildings build structures, exploring how they can be made stronger, stiffer and more stable</p> <p>evaluate their ideas and products against design criteria</p>

		explore and evaluate a range of existing products design purposeful, functional, appealing products for themselves and other users based on design criteria evaluate their ideas and products against design criteria		
Y2	NC Content	<u>Design and make a healthy snack link to science</u> explore and evaluate a range of existing products generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups use the basic principles of a healthy and varied diet to prepare dishes understand where food comes from.	<u>Recycled/upcycled fabrics</u> explore and evaluate a range of existing products design purposeful, functional, appealing products for themselves and other users based on design criteria select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics	<u>Design and make a mode of transport</u> explore and evaluate a range of existing products explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products. select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] evaluate their ideas and products against design criteria
KS2	NC Skills	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 develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world They should 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 should critique, evaluate and test their ideas and products and the work of others They should understand and apply the principles of nutrition and learn how to cook. Pupils should be taught how to cook and apply the principles of nutrition and healthy eating.		
Y3		<u>Baking and Nutrition</u> 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	<u>Catapults</u> understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] understand how key events and	<u>Build a bridge to go over the canal</u> apply their understanding of how to strengthen, stiffen and reinforce more complex structures investigate and analyse a range of existing products understand how key

		understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.	individuals in design and technology	events and individuals in design and technology have helped shape the world 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
Y4		<p><u>Electrical systems linked to science</u> 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.</p> <p><u>Textiles: Christmas product</u> 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</p>	<p><u>Board games</u> 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 select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</p>	<p><u>Cookery</u> 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</p>
Y5		<p><u>Tribal Huts</u> apply their understanding of how to strengthen, stiffen and reinforce more complex structures understand how key events and individuals in</p>	<p><u>Bread Baking</u> prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques understand seasonality, and know</p>	<p><u>Moving Toys</u> understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]</p>

		<p>design and technology have helped shape the world</p> <p>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</p>	<p>where and how a variety of ingredients are grown, reared, caught and processed.</p>	<p>understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]</p> <p>apply their understanding of computing to program, monitor and control their products. select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</p>
Y6		<p><u>Chocolate Wrappers link to Aztec topic</u></p> <p>understand how key events and individuals in design and technology have helped shape the world</p> <p>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</p> <p>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</p>		<p><u>Periscopes</u></p> <p>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 select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</p>

Skills					
Design and Technology					
Milestone 1		Milestone 2		Milestone 3	
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Making – planning practical skills and techniques					
<ul style="list-style-type: none"> *generate ideas and recognise characteristics of familiar products *use pictures and words to describe what they want to do *show that, with help, ideas can be put into practice *use tools and materials with help, where needed *choose materials from a range independently or suggested by teacher 	<ul style="list-style-type: none"> *begin to generate ideas and plan what to do next, based on their experience of working with materials and components *use models, pictures and words to describe their designs *select appropriate tools, techniques and materials, explaining their choices *select and use tools from a range suggested by teacher *choose materials and techniques *use correct technical vocabulary for projects from a range selected by teacher *begin to assemble, join and combine materials and components in a variety of ways 	<ul style="list-style-type: none"> *generate ideas and begin to recognise that designs have to meet a range of different needs *clarify ideas when asked and begin to use words, labelled sketches and models to communicate the details of their designs *make realistic plan for achieving aims i.e. ordering the stages of making *begin to think ahead about the order of their work *begin to identify appropriate tools, equipment, materials, components and techniques *select appropriate tools *measure, mark out, cut and shape a range of materials with a fair degree of accuracy *join, assemble and combine materials with a fair degree of accuracy 	<ul style="list-style-type: none"> *generate ideas by collecting and using information, take users' views into account *begin to produce step-by-step plans *communicate alternative ideas using words, labelled sketches and models *begin to demonstrate an awareness of constraints *select appropriate tools, equipment, materials, components and techniques *select appropriate techniques to make product *measure, mark out, cut and shape a range of materials accurately *join, assemble and combine materials accurately *use finishing techniques to strengthen and improve appearance of the product *demonstrate safe and careful procedures for 	<ul style="list-style-type: none"> *draw on and use various sources of information *use understanding of the characteristics of familiar products when developing own ideas *clarify ideas through discussion, drawing and modelling demonstrate an awareness of constraints *work from their own detailed plans, modifying where appropriate *select appropriate tools and techniques to make product *explain the sensory qualities of different materials cut and shape a range of materials with increasing precision *join, assemble and combine components with increasing precision *use a range of finishing techniques to strengthen and improve the appearance of the 	<ul style="list-style-type: none"> *draw on and use a range of sources of information including those of others *show understanding of form and function of familiar products *develop criteria for designs and use these to explore design proposals *produce plans that outline alternative methods of progressing *make models and drawings to explore and test their design thinking, discussing their ideas *produce step-by step plans as a guide for making *select and use appropriate tools and techniques and explain why they have been chosen *explain how different materials and processes might be used *measure, mark out, cut and shape a range of

		<ul style="list-style-type: none"> *use simple finishing techniques to improve the appearance of the product *use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical 	handling food	<ul style="list-style-type: none"> product *formulate step-by step plans as a guide to making 	<ul style="list-style-type: none"> materials with increasing precision *join, assemble and combine components with increasing precision *use appropriate finishing techniques to strengthen and improve the appearance of the product *check work as it develops and modify approach in the light of progress *formulate step-by step plans as a guide to making
Evaluating - own ideas and existing products					
<ul style="list-style-type: none"> *talk about their own and other people's work in simple terms *begin to describe how a product works *think of things they could have improved *talk about what and who products are for 	<ul style="list-style-type: none"> *begin to recognise that they have done well as work progresses *begin to suggest things they could do better in the future *talk about how products are used and what materials are used 	<ul style="list-style-type: none"> *compare own work with that of others *Say what they think and feel about their own work *Why materials were chosen 	<ul style="list-style-type: none"> *reflect on their designs as they develop, bearing in mind the way the product will be used *begin to identify what is working well and what could be improved *discuss how real products have been designed and if they achieve their purpose 	<ul style="list-style-type: none"> *begin to test and evaluate their products *show an understanding of the situations in which their designs will have to function *evaluate their products and their use of information sources *how well products have been designed and if designs achieve their purpose 	<ul style="list-style-type: none"> *evaluate how effectively they have used information sources *reflect on the quality of design and quality of build as they work *recognise that the quality of the product depends on how well it meets its purpose *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

Technical Knowledge					
<ul style="list-style-type: none"> *understand about the working characteristics of some materials *understand how mechanisms can be used in different ways *how free standing structures can be made stiffer and more stable *know that 3D textiles products can be produced from identical 2D shapes e.g. puppets 	<ul style="list-style-type: none"> *explain about the working characteristics of common materials *explain how mechanisms can be used in different ways – levers, sliders, wheels and axles 	<ul style="list-style-type: none"> *explain how the working characteristics of common materials affect the way they might be used *suggest how a mechanism could be used to make something move in a different way e.g. how mechanical systems such as levers and linkages or pneumatic systems create movement *know that a single fabric shape can be used to make a 3D textiles project 	<ul style="list-style-type: none"> *explain how the working characteristics of materials affect the way they might be used *suggest how a mechanism could be used to make something move in a different way *use electrical circuits with switches to good effect *suggest how to make strong stable structures *know how to program a computer to control their products 	<ul style="list-style-type: none"> *think how materials might be combined to create more useful properties *suggest how a mechanism such as a belt and a pulley could be used to make something move in a different way *use electrical circuits with motors and switches to good effect *suggest how to reinforce and strengthen a 3D framework *know that a 3D textiles product can be made from a combination of fabric shapes 	<ul style="list-style-type: none"> *suggest materials that could be combined for properties such as strength *use ICT control programme to make a mechanism work *create mechanical systems such as cars, pulleys or gears to create movement *know more complex electrical circuits and components can be used to create functional products *know how to program a computer to monitor changes in the environment and control their products *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
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