

CURRICULUM STATEMENT: DESIGN TECHNOLOGY

Our Curriculum Intent for Design and Technology:

The 'drivers' around which our curriculum is centred, without any subject preference or bias, are:

EXPLORE PERSEVERE (BE) INDEPENDENT COMMUNICATE

We want our pupils to develop EPIC qualities and become EPIC learners.

E: We want our pupils to have a love of exploring facts, finding information and developing new skills; we want them to be inquisitive and enquiring.

P: We want them not to give up at the first hurdle (or even the second); we want them to know that effort, commitment and hard work can pay dividends; we want them to persevere.

I: We want them to learn how to learn; to learn how to pursue lines of enquiry and interest themselves; we want them to develop independence.

C: We want them to be able to tell others, with confidence and clarity, what they know, what they think, what they imagine...we want them to be good communicators.

Whilst our 'Curriculum to Inspire' is based on the EYFS Curriculum and the National Curriculum, we have been proactive in our school by developing a new curriculum which inspires our children to learn and is relevant to their needs now - and in the future. We have tried to balance the 'have to' aspects alongside the 'got to' and the 'want to' aspects.

The aim of our curriculum is for pupils to have the requisite skills to be successful, independent and motivated learners in readiness for their next stage of education.

The Key Characteristics that we have identified, and that we believe, will make a good Design Technologist are:

- The ability to take creative risks to **explore**, then produce innovative ideas and **communicate** these through practical, written and verbal means.
- The ability to carry out research, showing initiative and **perseverance**. Asking questions to develop an understanding of users' needs.
- The ability to work **independently** and with others, whilst using time efficiently.
- An understanding of which tools, equipment and materials to use to make their products.
- The ability to **explore** a range of risks. To **communicate** these to others and manage the risks to make products safely and hygienically.

- A desire to **explore** technological innovations in materials, products and systems. Including taking inspiration from great designers in History.
- The ability to apply knowledge from other subject areas.

We believe that Design and Technology prepares pupils to participate in a rapidly changing world in which work, and other activities, are increasingly being transformed by technology. With this in mind, we encourage children to develop creative and innovative thinking, and so are better able to conceptualise, to understand and use Technological skills for their future.

Design Technology is a practical subject, in which invention and resourcefulness are encouraged. At Mountfields Lodge, Design and Technology enables our pupils to develop skills including design, make and evaluate. Using Design and Technological skills to support problem solving and enrich learning across the curriculum, ensures our children grow up prepared for an ever changing technological age.

Our Curriculum Implementation for DESIGN and TECHNOLOGY

At Mountfields Lodge School, we use the National Curriculum for Design and Technology, supplemented by other materials from the Design and Technology Association as the basis for our teaching.

A creative and practical approach which combines the teaching of skills and technical knowledge, through projects based on real and relevant problems within a variety of contexts. The projects include the six essential learning characteristics of the subject, as well as engaging in the iterative process of Design and Technology (Design, make and evaluate) The different aspects of the subject (e.g. materials, textiles or Cooking and nutrition) are planned in a way that is appropriate pupils' ages to encourage a growing confidence, creativity and independence in Design and Technology.

Pupils are taught to use resources and equipment responsibly as creative problem solvers, whilst respecting the environment and health and safety.

Our approach in the Early Years enables pupils to safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function and use what they have already learnt about media and materials in original ways, thinking about uses and purposes.

Our expectations for Teaching and Learning are:

- A progression map for Design and Technology (based on the NC Programme of study), which shows a clear progression of the knowledge understanding and skills of designing, making and evaluating are covered in each key stage. Attention is given to what pupils have already experienced, and subsequent steps in learning planned.

- Application of skills and processes should be linked to themes and across the curriculum, where appropriate.
- Teachers should find ways of contextualising Design and Technology, helping pupils relate this to real world situations.
- Skills are modelled and taught in directed lessons. Pupils then should be encouraged to apply skills independently. They should be given opportunities to evaluate and refine their designs rather than complete a finished product.
- Pupils are taught in mixed ability, and sometimes mixed-age group classes. However, those pupils identified with a higher learning potential should be challenged further and children who find aspects of their learning more difficult should be appropriately supported to experience success.
- We would expect children to engage with a unit on Food each year. Mechanisms, Electrical Systems, Textiles and Structures will be taught in line with our two year rolling program. We aim to teach 3 Design Technology projects a year.

Progression Map for DESIGN and TECHNOLOGY is:

DESIGN TECHNOLOGY PROGRESSION MAP

DESIGN TECHNOLOGY PROGRESSION MAP				
Mechanism		KS1	LKS2	UPS2
	Design	<ul style="list-style-type: none"> • Generate ideas and simple design criteria. • Develop and communicate ideas through drawings and mock-ups. • Planning making, selecting tools and using finishing techniques. 	<ul style="list-style-type: none"> • Generate their own realistic ideas and use annotated sketches and prototypes to develop, model and communicate ideas. • Understand and use pneumatic mechanisms. • Understand and use lever and linkages, and fixed and loose pivots. 	<ul style="list-style-type: none"> • Generate a design from research; develop a specification, model and communicate ideas. • Develop and communicate a simple design specification.
	Make	<ul style="list-style-type: none"> • Select a range of tools and equipment and materials to perform practical tasks. 	<ul style="list-style-type: none"> • Select and use tools with some accuracy, cut and join materials and components such as tubing, syringes and balloons. • Select and use tools with some accuracy to cut, shape and join paper and card. 	<ul style="list-style-type: none"> • Select use a range of tools and equipment to make products that that are accurately assembled and well finished within the constraints of time, resources and cost. • Produce lists of tools and materials and plans to make accurately assembled and well finished products within constraints.
	Evaluate	<ul style="list-style-type: none"> • Explore wheels and axles and evaluate their ideas and products against original criteria. • Exploring books and products; evaluating own product against original criteria. • Exploring sliders and levers; understanding types of movement; technical vocabulary. 	<ul style="list-style-type: none"> • Investigate and find information on and products with pneumatic mechanisms and evaluate their own products and ideas against criteria and user needs. • Investigate and analyse their own and others' products with lever and linkage mechanisms. 	<ul style="list-style-type: none"> • Compare final product to the original specification; test products with the intended user and critically evaluate the product, considering the views of others. • Investigate famous manufacturing and engineering companies relevant to the project.
	THEME	Wheels and Axels Sliders and Levers	Pneumatics Levers and Linkages	Cams Pulleys or Gears

	KS1	LKS2	UPS2
Textiles	Design	<ul style="list-style-type: none"> Generate, develop, and communicate ideas. Design a functional, appealing product for a chosen user and purpose. 	<ul style="list-style-type: none"> Generate innovative ideas through research. Produce detailed lists of equipment and fabrics and formulate step-by-step plans for making. Develop these using mock-ups and prototypes including using computer-aided design. Design functional, appealing products for the intended user that are fit for purpose based on a simple design specification.
	Make	<ul style="list-style-type: none"> Use a range of textiles, tools and equipment to perform practical tasks. Understand how 3-D textile products are made, using joining, templates and finishing to create two identical shapes. 	<ul style="list-style-type: none"> Select and use a range of tools and equipment, including CAD, to make products that are accurately assembled and well finished. Work within the constraints of time, resources and cost. Know that a 3-D textile product can be made from a combination of pattern pieces, fabric shapes and different fabrics and that fabrics can be strengthened, stiffened and reinforced.
	Evaluate	<ul style="list-style-type: none"> Explore and evaluate existing textile products and their own ideas and products. 	<ul style="list-style-type: none"> Investigate and analyse textile products linked to their final product and compare the final product to the original design specification.
	THEME	Templates and joining techniques	2-D shape to 3D product Using computer-aided design (CAD) in textiles Combining different fabric shapes

		KS1	LKS2	UPS2
Food	Design	<ul style="list-style-type: none">Designing appealing products for a user; investigating fruit and vegetables and generating ideas; communicating through talk and drawings.	<ul style="list-style-type: none">Generate ideas and develop design criteria for an appealing product for a user and purpose.Plan the main stages of a recipe, listing ingredients, utensils and equipment.	<ul style="list-style-type: none">Generate and explore innovative ideas through research and discussion to develop a design brief.Write a step-by-step recipe, including a list of ingredients, equipment and utensils.
	Make	<ul style="list-style-type: none">Selecting a range of fruits and vegetables; using simple utensils and equipment.Understand where ingredients come from and the basis of a healthy and varied diet.	<ul style="list-style-type: none">Select from a range of ingredients to make appropriate food products.Carry out and record evaluations of a variety of ingredients and products.	<ul style="list-style-type: none">Using appropriate utensils and equipment accurately, make, decorate and present a food product for the intended user and purpose.Understand seasonality and the source of different food products.
	Evaluate	<ul style="list-style-type: none">Tasting and evaluating user's preference; evaluating ideas and finished products against original criteria.	<ul style="list-style-type: none">Know a range of appropriate ingredients, and whether they are grown, reared or caught.	<ul style="list-style-type: none">Evaluate a range of relevant products and ingredients and the final product with reference to the design brief and specification.
	THEME	Preparing fruit and vegetables	Healthy and Varied Diet	Celebrating culture and seasonality

	KS1	LKS2	UPS2
Structures	Design	<ul style="list-style-type: none"> Generating design ideas; developing modelling and explaining using talk, mock-ups and drawings. 	<ul style="list-style-type: none"> Generate ideas and designs, developing them through analysis of shell structures and use CAD to model and communicate ideas. Plan the making and use appropriate tools and software, explaining their choices. Use computer-generated finishing techniques.
	Make	<ul style="list-style-type: none"> Planning making, selecting tools and new and recycled materials; using finishing techniques. Know about strengthening structures; knowledge of vocabulary 	<ul style="list-style-type: none"> Order the stages of making; selecting tools and using with some accuracy. Develop knowledge of nets of cubes and cuboids and more complex 3D shapes and how to construct strong, stiff shell structures. Formulate a plan with a step-by-step list of tasks and resources. Use tools to accurately measure, mark out, cut, shape and join materials to make frameworks. Use finishing techniques suitable for the product and critically evaluate their products against a range of criteria
	Evaluate	<ul style="list-style-type: none"> Exploring existing freestanding structures; evaluating their own products against original criteria. 	<ul style="list-style-type: none"> Investigate and evaluate shell structures, and construct strong, stiff shell structures. Test and evaluate own products against design criteria and intended user and purpose. Evaluate shell structures and their own products. Research user needs and existing products and develop and model innovative ideas into a design specification. Research key events and individuals relevant to frame structures.
	THEME	Freestanding structures	Shell structures Frame structures Shell structures using computer-aided design (CAD)

		KS1	LKS2	UPS2
Electrical Systems	Design		<ul style="list-style-type: none"> • Use annotated sketches, cross-sectional and exploded diagrams to develop and communicate ideas. • Gather information and develop and communicate realistic design ideas using annotated sketches and prototypes. 	<ul style="list-style-type: none"> • Develop a design specification for a functional product that responds automatically to changes in the environment. • Formulate a step-by-step plan to making, listing tools, equipment, materials and components. • Develop a design specification for a product that responds automatically to environmental changes in the environment. • Generate and communicate ideas through annotated sketches and representations of electrical circuits or circuit diagrams.
	Make		<ul style="list-style-type: none"> • Select and use tools with some accuracy to cut, shape, join and finish. • Use construction materials and electrical components according to their functional properties and aesthetic qualities. • Connect simple electrical components in a series circuit and program an interface to enhance the way the product works. 	<ul style="list-style-type: none"> • Use a computer control program to enable an electrical product to work automatically in response to changes in the environment. • Create and modify a computer control program to enable their electrical product to respond to changes in the environment.
	Evaluate		<ul style="list-style-type: none"> • Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers. • Investigate and analyse a range of powered products including programmed, and evaluate their own products and design criteria. • Understand and use computing to program and control products with electrical systems. 	<ul style="list-style-type: none"> • Test and evaluate the system to demonstrate its effectiveness for the intended user and purpose. • Know and use technical vocabulary relevant to the project.
	THEME	Freestanding structures	Simple circuits and switches Simple programming and control	More complex switches and circuits Monitoring and Control

The school is committed to resourcing the Design and Technology Curriculum in terms of technology and peripherals.

Pupils are given the opportunity to use Design and Technology skills independently at home through choices in their Remote Learning.

Our Curriculum Impact for DESIGN and TECHNOLOGY:

In our school we have a set of assessment 'tasks'/tools that we use across all Foundation subjects; tasks/tools that are widely used (by teachers) and widely known (by pupils). We use these in **Design and Technology**

We believe that they have maximum impact on T&L outcomes (learning 'stickiness' and impact on 'next lesson' content and approach) for minimum demand upon staff workload and pupil wellbeing.

In **Design and Technology** we recognise that we need to:

- **Share the Curriculum 'Journey'** – *do the pupils know what they are doing and why they are doing it and where it 'fits in'?*
- **Check previous knowledge/understanding/skills** – *what can the pupils remember from previous learning? Has it stuck?*
- **Check new knowledge/understanding/skills** – *have the pupils retained the objective of the lesson? Has it stuck?*
- **Using 'the checks' to adjust T&L** and improve outcomes.

We believe that if our assessment is regular, consistent and focused in **Design and Technology** it will be relevant and impactful.

Our 3 agreed approaches to assessment in Design and Technology are

1) At the Planning Stage

CTs refer to the **Progression Map for Design and Technology** (x-ref Curriculum Implementation statement) at the point of planning and consider not only the 'current' Yr Gp expectations but also make themselves fully aware of the 'previous' and the 'next' expectations.

CTs then reference 'prior learning' in their introductory slide(s) (ppt/flipchart) to a new theme/unit; i.e. 'Do you remember in Year ? when you did/learned about/found out about?'

CTs judge the 'stickiness of the prior learning' and help pupils contextualise their learning. We do this to remind our pupils of what they have already been taught/have learnt and how it fits in to previous (and possibly future) learning/knowledge and skills acquisition.

2) The Learning Journey

CTs create and share **The Learning Journey** of each unit/theme in **Design and Technology** (in a ppt or flipchart slide); this includes * **Questions** (max.6) that are to be answered throughout the theme/unit, Unit-specific **vocabulary** that must be used/taught and the **Core Learning** expectations.

The slide is referred to at the beginning of each **Design and Technology** lesson; the strength of this is the coming back to it regularly and making sure the questions are answered and the vocabulary is embedded.

Our school's **Core Learning** expectations in **Design and Technology** map out the 'non-negotiables' along the Learning Journey of a pupil in MfL. These **Core Learning** expectations are taken from our school's **Design and Technology Progression Map**, which itself reflects the **National Curriculum**.

They clarify **our Curriculum Intent** for **Design and Technology**. They are our, ***'by the time a pupil in MfL leaves (an identified Yr Gp) they must know/have experience of/ learn...'***

They 'build' on previous learning/K&U/skills and are our 'points of assessment' in **Design and Technology** along the Learning Journey; they are things that are assessed by CTs and their stickiness monitored by Subject Leads and the SLT. They are how we assess **Design and Technology**

Core Learning Statements for Design and Technology:

D&T		
Year 1/2	Year 3/4	Year 5/6
Design Communicate design ideas for products that have a clear purpose and an intended user through talking and drawing.	Design Communicate design ideas for products that have a purpose through talking, annotated sketches, mock-ups and templates.	Design Use research to develop ideas of innovative, functional and appealing products that are fit for purpose. Generate, develop, model and communicate their ideas through most appropriate medium e.g. exploded diagrams, prototypes, computer aided design.
Make Make products, refining the design as work progresses.	Make Make products by working efficiently (such as by carefully selecting materials).	Make Make products through stages of prototypes, making continual refinements Ensure products have a high quality finish, using art skills where appropriate
Evaluate Explore and evaluate a range of existing products to identify likes and dislikes of the designs and suggest improvements. Evaluate their ideas and products against given design criteria.	Evaluate Evaluate their ideas and products against their own design criteria. Refine work and techniques as work progresses.	Evaluate Evaluate their ideas and products independently against design criteria and consider the views of others to improve their work. Refine work and techniques as work progresses.
Each year children will experience an aspect of cooking & nutrition, textiles, materials & mechanisms which will incorporate the design process of Design/Make/Evaluate.		

3) Photo Books

Each class has a **Photo Book**; it is used to 'capture the active learning' that the pupils have undertaken'.

We know that **our pupils** are more able to recall previous learning when they have a photo/picture/artefact prompt - a class photobook enables that. The Photo Book is referred to in class to bring prior learning to the fore, i.e. 'Do you remember when...?'

The aim is to ultimately produce QR codes (QR stands for Quick Response; it is basically a quick, scannable barcode-like image that takes you to a specific digital destination) for any videos/pieces of evidence of active/inspiring/engaging T&L that would be saved in our Shared Drive.

Our 3 agreed assessment tools in 'SUBJECT' are:

A) Flashcards:

We use these to engage 'active recall' through securing memory connections.

We believe that comparing recalled answers with correct /given answers, strengthens self-reflection (or metacognition).

B) Quizzes

These are short and focused; they can be online, self-quizzes, group quizzes or class 'team' quizzes. They are 'low stake' i.e. they are not considered to be the 'be all and end all' of assessment; there is no scoring, marking, recording or ranking of classmates etc.

We believe that frequent no- or low-stakes - quizzes help cement long-term learning as they require pupils to bring previously acquired information to mind. By retrieving information, they organise it and create cues and connections. We believe that quizzing enables pupils to interact with the learning content; to think, dig deep and be an active participant.

C) Exit Tickets

These are used at the end of a T&L session; again they are 'low stake'. Questions are posed to each individual on 'exit' from the lesson, or random individuals are selected, or table groups are questioned etc. We use these to consolidate, embed and check understanding; 'tickets' can be based on 'current'/recent learning OR can reference prior but linked learning.

We understand that the assessments made in **Design and Technology** must be

- Utilitarian – seeking the greatest good for the greatest number
- Opportunist – picking up ideas and misconceptions as you find them
- Efficient – keeping things simple and brief
- Mastery-oriented – seeking to get every pupil to a key level of understanding

We believe it is extremely important that pupils do not see going back to the previous lesson as a punishment, for the teacher or for them – the culture in the classroom has to be that it is a chance to improve and to understand fully.

We do not forget that Marking and Feedback of our pupils' learning also enables us to provide effective feedback to pupils on their learning performance. We can give recognition and appropriate praise for achievement. It helps us identify effective strategies and 'next steps' for improvement; it helps inform future planning. (x-ref. Marking and Feedback Policy).

Using the 3 agreed 'tools' for assessment in **Design and Technology** and ensuring we deliver on our 3 agreed 'assessment approaches' we believe we are well placed to confidently report to pupils and parents in the statutory end-of-year Individual Pupil Reports in terms of Core Learning attainment.

We do not believe that in **Design and Technology** there is any value, or need, to have a complex method of capturing attainment 'data' that, on first glance, might look good (i.e. a class list against a range of objectives, all annotated with colours/lines/marks that mean something once the coding is understood) but has little to no impact on T&L outcomes; i.e. 67% of Class 'B' attained at the expected standard in Music. Such data, in our experience, has little value, or impact on the 33% who didn't make the grade? Does it mean the learning was too hard for them? Does it mean the teaching didn't engage them? Does it mean they have failed? Does it mean they have missed that learning opportunity and won't revisit it for 2 more years?

We believe, that our considered method of assessment in **Design and Technology** does everything we need it to do.

We actively involve pupils in their own learning in Design and Technology. We aim to promote the motivation of our pupils and their desire to improve, asking them to evaluate their own learning and recognise their achievement.

We measure progress in Design and Computing through pupil work sampling and observation. We measure the success of our curriculum through pupil interview and curriculum review; we ask our pupils how they feel about their learning as their voice is important to us.

In Early Years Foundation Stage, we assess pupils' ability to handle equipment and tools effectively. We also safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Children will begin to use what they have learnt about media and materials in original ways, thinking about their uses and purposes. They represent their own ideas, thoughts and feelings through all areas of Design and Technology, Art, Music, Dance, role play and stories.