School Partnership

Design Technology

Policy produced by school

Adopted by Governors FGB-Academic year 2023/24 updated 04.09.23
Review date- As changes are made

Intent of our curriculum

Curriculum design

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. Children must be able to talk about what they have learned in a knowledgeable and articulate way, using their 'public voice'.

Our 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

We provide our children with a curriculum which is engaging and stimulating and develops not just their **knowledge of design and technology**, but builds on prior learning of the skills and processes require so that their knowledge can be applied in a range of contexts relevant to everyday life and the world around us.

At our school we see the Y1 to Y6 curriculum as a body of **subject specific knowledge** defined by us and the National Curriculum and so we take a **knowledge led approach**. Skills are an outcome of the curriculum, not its purpose. When children are 'fluent' in knowledge they can then apply that knowledge as part of skill acquisition.

We have a **clear focus on subjects** as units to deliver the curriculum. Our **Curriculum Map** and units of work in every subject contain the knowledge that we have identified as essential in our school.

Our **Units of Work** in each subject have been carefully crafted by expert teachers across our school partnership, identifying **composite tasks** and breaking them down in to **component tasks** to ensure **sequential, layered knowledge acquisition**. These Units of Work also support our particular **'instructional'** style of teaching and help with the speedy and effective induction of new staff. This is particularly important in an inner London environment where the cost of accommodation prevents most of our staff from being able to stay with us long term.

We use a questioning approach in order to help children with **knowledge retention** and issues around **working memory** to ensure that children **know more and remember more**. Our

teaching style has a strong focus on the effective retention and use of **subject specific vocabulary** using Walk The Word techniques.

Visits and Visitors are detailed on the Whole School Curriculum Map. Teachers will record evidence of visits and visitors as a photo page (with an explanation) in children's science books. It is the teacher's responsibility to book visits and visitors according to school policy. Teachers are also responsible for booking transport and completing a preliminary visit for the risk assessment prior to the visit.

Implementation of our curriculum

The implementation of our curriculum is greatly supported by **carefully structured unit plans, leading pupils through component knowledge and skills to composite knowledge and skills** in all subjects.
Our pedagogical approach is based on **Rosenshine's Principles of Direct Instruction**. The brilliant clarity and simplicity of this approach supports teachers to engage with cognitive science and the wider world of educational research.
The Principles of Direct Instruction

1. Daily Review
2. Present new material using small steps
3. Ask questions
4. Provide models
5. Guide student practice
6. Check for student understanding
7. Obtain a high success rate
8. Provide scaffolds for difficult tasks
9. Independent practice
10. Weekly and monthly review

Resources

Design and technology resources should be stored in the resource room and the art cupboard.

Assessment

From Y1- Y6 children are assessed individually against the statutory outcomes for each year group. They are graded Below Expected Standard (Y?), Working towards Expected Standard, Expected Standard and Greater Depth within Expected Standard. The design and technology assessment statements can be found at the end of this policy document.

Staff training

Staff receive termly support and training through a programme of Professional Development Meetings and 1-1 coaching opportunities, keeping their knowledge, skills and understanding up to date and relevant for delivering the curriculum.
New staff are given a mentor for 12 months.

Parent involvement

Through parents' meetings, the school newsletter and the school website parents are encouraged to support their children's learning in design and technology.

The role of the subject co ordinator

Subject leaders

- provide continuous professional development for staff
- monitor the quality of provision in the design and technology curriculum and report to senior leaders
- monitor pupil outcomes in design and technology and report to senior leaders
- conduct termly audits of resources and organise the ordering of resources in need of replenishment

Monitoring and evaluation

The quality of provision in design and technology is monitored and evaluated according to the annual school monitoring and evaluation plan.

Progression through the Design and technology curriculum								
	RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7 (KS3)
Design Structures	We are learning to talk about the materials we need to create a 3D structure. We are learning to discuss our design ideas for a 3D structure. We are learning to plan what to use to join attach materials together.	We are learning to design a model house.	We are learning to explore kite designs.	We are learning to design a stable structure for a purpose.	We are learning to design a functional kite.	We are learning to design a recreated musical instrument.	We are learning to design a scale model bridge structure. We are learning to design a product based on a brief.	We are learning to create designs based on user needs. We are learning to identify and solve our own design problems. We are learning to develop specifications to inform our designs. We are learning to use a range of techniques to develop and communicate design ideas.
Mechanical Systems		We are learning to design a fire engine model with moving wheel mechanisms. We are learning to design a model windmill.	We are learning to design picture with a sliding mechanism. We are learning to design a model vehicle.	We are learning to design a pneumatic system.	We are learning to design a children's book with mechanical features.	We are learning to design a movable toy featuring an automaton mechanism.		

Electrical Systems				We are learning to design an illuminated sign featuring a circuit.	We are learning to design a torch featuring an electric circuit.	We are learning to design an alarm featuring a buzzer.	We are learning to design a model fairground ride featuring a circuit with a motor.	
Make Structures	We are learning to create 3D structures. We are learning to explore different ways to cut, shape and join materials.	We are learning to make a model house structure.	We are learning to construct a kite based on a design.	We are learning to make a mini greenhouse structure.	We are learning to make a kite.	We are learning to make an African style musical instrument.	We are learning to make a scale model bridge. We are learning to make functional bird house structures.	We are learning to select and use specialist tools, techniques and equipment.
Mechanical Systems			We are learning to make a picture with a moving mechanism. We are learning to make a model vehicle with working wheels, axels and chassis.	We are learning to make a monster with a pneumatic system.	We are learning to make a story book with mechanical, movable pieces.	We are learning to make a movable toy featuring an automaton mechanism.		

Electrical Systems				We are learning to construct an illuminated sign featuring a working circuit.	We are learning to make a working torch model.	We are learning to make an alarm featuring a working buzzer circuit.	We are learning to make a fairground ride model featuring a circuit with a motor.	
Evaluate		We are learning to ask and answer questions about our product.	We are learning to answer questions about our work. We are learning to wonder about how we can improve our products.	We are learning to evaluate our product and record our evaluations.	We are learning to evaluate the function of our product. We are learning to evaluate the decorative aspects of our product.	We are learning to evaluate the function of our product. We are learning to evaluate our product against design criteria.	We are learning to evaluate our product against design criteria. We are learning to evaluate whether our product meets a design brief. We are learning to evaluate other people's products.	We are learning to analyse work of professionals. We are learning to investigate new and emerging technologies. We are learning to test, evaluate and refine our ideas and products against a specification. We are learning to understand developments in design and technology.
Technical Knowledge	We are learning to attach materials securely.	We are learning to join and combine shapes. We are learning about	We are learning to make sliders and levers. We are learning to use	We are learning to understand and make pneumatic systems.	We are learning to create a circuit with a bulb and switch. We are	We are learning to create automaton mechanisms. We are	We are learning to create a circuit featuring a motor. We are	We are learning to use materials purposefully to achieve functioning solutions.

		how wheels, axels and chassis work.	wheels, axels and chassis in our models	We are learning to create a circuit featuring a bulb.	learning to explore and create different moveable mechanisms.	learning to create a circuit featuring a buzzer. We are learning to select materials based on their functional properties.	learning to make scale models. We are learning to cut a range of materials safely.	We are learning to understand advanced mechanical systems. We are learning to understand how advanced electrical and electronic systems can be powered.

Design and technology

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.

Attainment targets

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Schools are not required by law to teach the example content in [square brackets].

A: Autumn C: Summer
B: Spring

Subject content

Key stage 1

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

- design purposeful, functional, appealing products for themselves and other users based on design criteria - 1a, b, c + 2a, b, c
- generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology - 1a, b, c + 2a, b, c

Make

- select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] - 1a, 1b, 1c, 2b
- select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics - 1b, 2a, 2c

Evaluate

- explore and evaluate a range of existing products 1a, 1c, 2a, 2b
- evaluate their ideas and products against design criteria 1a, b, c + 2a, b, c

Technical knowledge

- build structures, exploring how they can be made stronger, stiffer and more stable 1a, 1c, 2b
- explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products. 1b, 2a, 2c

Key stage 2

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].

When designing and making, pupils should be taught to:

Design

3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c

- 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 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c

Make

3c, 4b, 5b, 6a, 6c

- 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 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c

Evaluate

3b, 4a, 4b, 5a, 5b, 5c, 6a, 6c

- 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 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c
- understand how key events and individuals in design and technology have helped shape the world 3b, 4b, 5b, 6a

Technical knowledge

- apply their understanding of how to strengthen, stiffen and reinforce more complex structures 3c, 4b, 5b, 6a, 6c
- understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] 3a, 4c, 5a
- understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] 3b, 4a, 5c, 6b
- apply their understanding of computing to program, monitor and control their products.

Computing Year 3 and 5 curriculum

Design and Technology Assessment Statements
Year 1 **Name:**

Expected standard Year 1

Statements of assessment	February	July
Disciplinary knowledge		
I can comment on the design and function of existing products		
I can generate and communicate my ideas through discussion		
I can design a functional and appealing product based on a design criteria		
I can select from and use a wide range of materials according to their functional properties and aesthetic qualities		
I can select from and use a range of tools and equipment to perform practical tasks (e.g. cutting, shaping, joining and finishing)		
I can use mechanical systems (e.g. wheels, axels and chassis) in my products		
I can ask and answer questions about my created product		
I can compare my product to the design criteria		
I can explore ways to make structures stronger, stiffer and more stable		
Substantive knowledge		
I can build products (e.g. a mini house, a mini fire engine and a windmill) based on a design		

February assessment point **On track to**_____

July assessment point _____

Design and Technology Assessment Statements
Year 2 **Name:**

Expected standard Year 2

Statements of assessment	February	July
Disciplinary knowledge		
I can explore and evaluate a range of existing products.		
I can generate and communicate my ideas through discussion		
I can design a functional and appealing product based on a design criteria		
I can select from and use a wide range of materials according to their functional properties and aesthetic qualities		
I can select from and use a range of tools and equipment to perform practical tasks (e.g. cutting, shaping, joining and finishing)		
I can use mechanical systems (e.g. sliders, levers, wheels, axels and chassis) in my products		
I can ask and answer questions about my created product		
I can evaluate my ideas and products against the design criteria		
I can explore ways to make structures stronger, stiffer and more stable		
Substantive knowledge		
I can build products (e.g. a moving picture, a kite and a model vehicle) based on a design		

February assessment point **On track to**_____

July assessment point _____

Design and Technology Assessment Statements
Year 3 **Name:**

Expected standard Year 3

Statements of assessment	February	July
Disciplinary knowledge		
I can comment on the design and function of a range of existing products		
I can develop design criteria to inform the construction of a product		
I can consider and ask questions about how key events in design technology have helped shape the world		
I can generate and communicate my ideas through discussion, annotated sketches and diagrams		
I can select from and use a wide range of materials according to their functional properties and aesthetic qualities		
I can select from and use a range of tools and equipment to perform practical tasks (e.g. cutting, shaping, joining and finishing)		
I can use mechanical systems in my products		
I can apply my knowledge of how to strengthen, stiffen and reinforce a structure		
With support, I can apply my knowledge of science to control a product I have made		
I can evaluate my ideas and products against my own design criteria		
I can talk about ways to improve my work		
Substantive knowledge		
I can create fit for purpose products (e.g. a moving monster, a light up sign and a mini greenhouse) based on a design		

February assessment point **On track to**_____

July assessment point _____

Design and Technology Assessment Statements
Year 4 **Name:**

Expected standard Year 4

Statements of assessment	February	July
Disciplinary knowledge		
I can comment on the design and function of a range of existing products		
I can develop design criteria to inform the construction of a product		
I can consider and ask questions about how key events in design technology have helped shape the world		
I can generate and communicate my ideas through discussion, annotated sketches and diagrams		
I can select from and use a wide range of materials according to their functional properties and aesthetic qualities		
I can select from and use a range of tools and equipment to perform practical tasks (e.g. cutting, shaping, joining and finishing)		
I can use mechanical systems in my products		
I can apply my knowledge of how to strengthen, stiffen and reinforce a structure		
I can apply my knowledge of science to control a product I have made		
I can evaluate my ideas and products against my own design criteria		
I can consider ways to improve my work		
Substantive knowledge		
I can explain how key events and individuals in design and technology have helped shaped the world		
I can create fit for purpose products (e.g. a torch, a Chinese kite and a storybook) based on a design		

February assessment point **On track to**_____

July assessment point _____

Design and Technology Assessment Statements
Year 5 **Name:**

Expected standard Year 5

Statements of assessment	February	July
Disciplinary knowledge		
I can investigate and analyse a range of existing products		
I can develop design criteria to inform the construction of a product		
I can generate, develop and communicate my ideas through discussion, annotated sketches and diagrams		
I can select from and use a wide range of materials according to their functional properties and aesthetic qualities		
I can select from and use a wide range of tools and equipment to perform practical tasks (e.g. cutting, shaping, joining and finishing)		
I can use mechanical systems in my products		
I can apply my knowledge of how to strengthen, stiffen and reinforce a structure		
I can apply my knowledge of science to control a product I have made		
I can evaluate my ideas and products against my own design criteria		
I can consider the views of others to improve my work		
Substantive knowledge		
I can explain how key events and individuals in design and technology have helped shaped the world		
I can create fit for purpose products (e.g. a moving toy, an African instrument and an electrical alarm clock) based on a design		

February assessment point **On track to**_____

July assessment point _____

Design and Technology Assessment Statements
Year 6 **Name:**

Expected standard Year 6

Statements of assessment	February	July
Disciplinary knowledge		
I can investigate and analyse a range of existing products		
I can generate my own design criteria based on a brief		
I can generate, develop and communicate my ideas through discussion, annotated sketches and diagrams		
I can select from and use a wide range of materials according to their functional properties and aesthetic qualities		
I can select from and use a wide range of tools and equipment to perform practical tasks (e.g. cutting, shaping, joining and finishing)		
I can use mechanical systems in my products		
I can apply my knowledge of how to strengthen, stiffen and reinforce a structure		
I can apply my knowledge of science to control a product I have made		
I can evaluate my ideas and products against my own design criteria		
I can consider the views of others to improve my work		
Substantive knowledge		
I can explain how key events and individuals in design and technology have helped shaped the world		
I can apply my knowledge of mathematics to create scale model structures (e.g. a bridge, fairground ride and a bird house)		

February assessment point **On track to**_____

July assessment point _____