Design and Technology Curriculum Long Term Overview

CURRICULUM	CHARACTER	COMMUNITY
Design and Technology Curriculum Overview		
Intent: To ignite children's curiosity for how things work and to equip them with the technical knowledge and the practical skills in their long-term memory to enable them to design, make, break and evaluate a range of products for a specific user and purpose.		
Substantive Knowledge	Substantive knowledge in D&T refers to the factual and conceptual understanding pupils need to design and make effective products. This includes knowledge of materials and their properties, mechanical and electrical components, nutrition and food sources and the purpose and features of existing products.	
Disciplinary Knowledge Strands	Disciplinary knowledge in D&T refers to understanding the practices and thinking processes that underpin the work of designers and engineers. It encompasses recognising what makes a product effective, approaching problems creatively and testing and refining ideas in response to real needs.	
Procedural knowledge	Procedural knowledge in D&T is the knowledge of how to perform tasks: the hands-on skills, techniques and methods needed to design, make and evaluate products effectively. It encompasses everything from how to cut, shape, join and finish materials to using tools, equipment and ingredients safely and accurately.	
Substantive Knowledge Categories		
Cooking and nutrition	Cooking and nutrition is about helping pupils understand food, health and basic cooking processes. Children learn how to prepare simple dishes, understand balanced diets and explore where food comes from.	

Design and Technology Curriculum Long Term Overview

Electrical systems	Electrical Systems introduces pupils to the basic principles of electricity and how electrical components can be used in products and systems. Through practical investigation and design activities, pupils learn how electrical systems work and how they can be applied to create purposeful products. This area of learning focuses on developing pupils' understanding of simple circuits, electrical components, and control systems, alongside opportunities to design, make and evaluate products that use electricity.
Mechanisms/mechanical systems	Mechanisms and Mechanical Systems introduces pupils to how moving parts work together within products. Pupils learn how different mechanisms create movement and how these systems can be used to solve problems and improve the function of designed products. Through practical investigation, design and making activities, pupils develop an understanding of movement, force and mechanical components. They explore how mechanisms such as sliders, levers, wheels, axles, pulleys and gears allow products to move or operate effectively.
Structures	Structures introduce pupils to how objects and buildings are designed and constructed to be strong and stable. Pupils learn how different shapes, materials and construction techniques affect the strength and stability of a structure. Through investigation and practical design activities, pupils explore how structures support loads, resist forces, and remain stable. They learn how designers and engineers use specific design features to strengthen structures and ensure they perform effectively.
Textiles	Textiles introduces pupils to how fabrics and materials can be joined, shaped and decorated to create functional and aesthetic products. Pupils develop an understanding of different textiles, how they are used in everyday life and how they can be manipulated using simple tools and techniques. Through practical design and making activities, pupils learn how to select appropriate materials, join fabrics in different ways, and add decorative features.
Digital world	Digital World introduces pupils to how digital systems and programmable technologies are used to control and enhance products in everyday life. Pupils develop an understanding of how digital devices work and how simple programming can be applied to create functional, interactive products. Through practical, design-based activities, pupils explore how digital components and simple coding can be used to solve problems and control outputs such as lights, sounds, and movement.

Design and Technology Curriculum Long Term Overview

	Unit 1	Unit 2	Unit 3	Unit 4
EYFS	STRUCTURES Junk Modelling - joining *Product: A house* *Purpose: To live in* *User: Three little pigs*	STRUCTURES Solid Structures *Product: A boat* *Purpose: To float on water* *User: Small characters*	COOKING AND NUTRITION Making soup *Product: soup* *Purpose: to explore local ingredients* *User: parents and children*	TEXTILES Threading and Weaving *Product: a bookmark* *Purpose:to use in a book* *User: library users/librarian*
Year 1	TEXTILES Simple stitches *Product: bunting* *Purpose: For decorating the classroom* *User: class*	COOKING AND NUTRITION Portable Snacks - Smoothies *Product: A fruit smoothie* *Purpose: A tasty & nutritious snack* *User: Family*	STRUCTURES 1.4 Stable Structures *Product: A pencil pot* *Purpose: To hold pencils* *User: Teacher/parent*	MECHANISMS Wheel and Axle Mechanisms *Product: A wind powered car* *Purpose: To transport people* *User: People*
Year 2	STRUCTURES Stable structures *Product: A throne for a king* *Purpose: To sit on* *User: the king*	COOKING AND NUTRITION A healthy wrap *Product: a wrap* *Purpose: A quick, nutritious snack* *User: Family*	MECHANISMS Lever Mechanisms *Product: A small grabber* *Purpose: To pick up litter* *User: Children*	TEXTILES Running stitches *Product: a pouch* *Purpose: To hold goods* *User: parents*
Year 3	TEXTILES (Y5 unit) Blanket stitch *Product: A stuffed toy* *Purpose: To play with* *User: EYFS children/younger siblings*	MECHANICAL SYSTEMS Pneumatic systems *Product: A pneumatic toy* *Purpose: To entertain* *User: children*	COOKING AND NUTRITION Eating seasonally *Product: seasonal tarts* *Purpose: using seasonal ingredients to make a main course* *User: Friends & family*	ELECTRICAL SYSTEMS Electrical poster *Product: A poster about the romans encompassing a simple circuit* *Purpose: To showcase knowledge* *User: A museum*
Year 4	TEXTILES Fastenings *Produce: A book sleeve* *Purpose: To protect books* *User: librarians*	MECHANICAL SYSTEMS/DIGITAL WORLD Mechanical cars *Product: A controlled car* *Purpose: To entertain children* *User: Children* *Combination of Kapow and lego/wedo*	COOKING AND NUTRITION Adapting a recipe *Product: biscuits* *Purpose: to select ingredients and follow a budget* *User: Family and friends*	STRUCTURES Shell structures *Product: A helmet* *Purpose: To understand how to strengthen and protect* *User: Warehouse workers*
Year 5	ELECTRICAL SYSTEMS/DIGITAL WORLD Circuits and motors	TEXTILES (Y3 unit) Cross stitch and appliqué	MECHANICAL SYSTEMS Pulleys and Gears	COOKING AND NUTRITION Developing a recipe

Design and Technology Curriculum Long Term Overview

	Product: A moon rover (doodler) *Purpose: Astronauts to travel on the moon* *User: Astronauts*	*Product: An egyptian collar* *Purpose: decorate an Egyptian* *User: Egyptian royalty*	*Product: Eco-gadget bike* *Purpose: To transport people* *User: Tourists*	*Product: Bolognese* *Purpose: To understand ingredients and how they are processed and to evaluate nutritional content* *User: Family*
Year 6	MECHANICAL SYSTEMS Automata toys *Product: An automation toy* *Purpose: To entertain a child* *User: Children aged 5 -7*	TEXTILES Designing *Product: A bag* *Purpose: To develop design ideas* *User: Family members*	STRUCTURES/DIGITAL WORLD Playground design structure *Product: a playground design using tinkercad* *Purpose: A school (HF)* *User: Teachers & Pupils*	COOKING AND NUTRITION Recipe design *Product: Three course meal* *Purpose: To provide a family meal* *User: Family*

Progression of Skills & knowledge

Structures

EYFS	
Skills Design • Making verbal plans and material choices. • Developing a junk model. • Designing a junk model boat. • Using knowledge from exploration to inform design. Make • Improving fine motor/scissor skills with a variety of materials. • Joining materials in a variety of ways (temporary and permanent). • Joining different materials together. • Describing their junk model, and how they intend to put it together. • Making a boat that floats and is waterproof, considering material choices. Evaluate	Knowledge Technical • To know there are a range to different materials that can be used to make a model and that they are all slightly different. • Making simple suggestions to fix their junk model. • To know that 'waterproof' materials are those which do not absorb water. Additional • To know that some objects float and others sink. • To know the different parts of a boat.

• Giving a verbal evaluation of their own and others' junk models with adult support. • Checking to see if their model matches their plan. • Considering what they would do differently if they were to do it again. • Describing their favourite and least favourite part of their model. • Making predictions about, and evaluating different materials to see if they are waterproof. • Making predictions about, and evaluating existing boats to see which floats best. • Testing their design and reflecting on what could have been done differently. • Investigating the how the shapes and structure of a boat affect the way it moves	
Year 1	
Skills Design • Thinking about what others might want from a design. • Beginning to recognise how products and designs in the world around us solve certain needs. • Considering who they are designing for – identifying the user • Stating what they intend to make and why – identifying the purpose. • Talking about ideas, with purpose and user in mind. • Talking about existing products when generating ideas. • Using basic drawing skills to communicate ideas.	Knowledge Technical • Recognising that different structures are used for different purposes. • Exploring the features of structures. • Describing structures as buildings or freestanding structures. • Making stable structures from card. • Creating supporting structures to aid stability. • Using stable objects like cylinders to create structures. • To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses).

Design and Technology Curriculum Long Term Overview

- Learning the importance of a clear design criteria
- Including individual preferences and requirements in a design

Make

- Choosing between a small number of materials, ingredients or components.
- Explaining their choices based on personal experiences.
- Requesting equipment appropriate to the purpose. (e.g. scissors for cutting, glue for joining)
- Beginning to use objects with a fixed width or length to create even spacing of markings or cuts (e.g. a lolly stick).
- Refining their grip to cut competently and confidently.
- Cutting straight lines and evenly spaced lines.
- Beginning to cut large shapes and thicker materials like card.
- Making stable structures from card.
- Following instructions to cut and assemble the supporting structure of a windmill.
- Making functioning turbines and axles which are assembled into a main supporting structure
- Finding the middle of an object.
- Puncturing holes.
- Adding weight to structures.
- Creating supporting structures.
- Cutting evenly and carefully.

Evaluate

- Discussing existing products, saying what they like about them.

- To understand that axles are used in structures and mechanisms to make parts turn in a circle.
- To begin to understand that different structures are used for different purposes.
- To know that a structure is something that has been made and put together.
- To know that the sails or blades of a windmill are moved by the wind.
- To know that a structure is something built for a reason.
- To know that stable structures do not topple.
- To know that adding weight to the base of a structure can make it more stable

Additional

- To know that the ‘user’ is the person who will use the product.
- To know that different users may want different things from a design.
- To know that who they are designing for makes a difference to what they design.
- To know that the purpose is what something is for.
- To know that existing products can help when deciding what to design.
- To know that drawings are a way to explain ideas.
- To know that a plan is deciding what to do first and next.
- To know that different equipment does different things.
- To know the names of common pieces of equipment.
- To know that some products will be better than others.
- To know that their ideas or products can be made better.

Design and Technology Curriculum Long Term Overview

• Comparing two products and discuss which is better for a specific purpose. • Saying what they like about their peers' designs and products. • Accepting feedback and understanding it is meant to improve their work • Evaluating a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't. • Suggest points for improvements.	• To know that their ideas can improve someone else's work. • To know that other people's ideas can help make their work better. • To know that a structure is something that has been made and put together. • To know that stable structures do not topple. • To know that shapes and structures with wide, flat bases or legs are the most stable. • To know that adding weight to the base of a structure can make it more stable. • To know that design criteria are a list of points to ensure the product meets the clients needs and wants. • To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity. • To know that windmill turbines use wind to turn and make the machines inside work. • To know that a windmill is a structure with sails that are moved by the wind. • To know the three main parts of a windmill are the turbine, axle and structure. • To know that windmills are used to generate power and were used for grinding flour,

National curriculum - end of KS1

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

select from and use a range of tools and equipment to perform practical tasks

select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics

explore and evaluate a range of existing products

evaluate their ideas and products against design criteria

build structures, exploring how they can be made stronger, stiffer and more stable

explore and use mechanisms in their products.

use the basic principles of a healthy and varied diet to prepare dishes

understand where food comes from.

Progression of Skills & knowledge

Structures

Year 2	
Skills Design • Using a simple design brief that outlines the intended use, target user, and key features of the product, to create simple design criteria. • Creating ideas with design criteria in mind. • Referring to specific parts of existing products when generating ideas. • Generating and communicating ideas using sketching and modelling. • Learning about different types of structures, found in the natural world and in everyday objects. Make • Choosing materials, ingredients or components from a wider range of materials, ingredients or components. • Explaining their choices based on the properties of materials and components. • Looking for ways to make cutting easier, like turning the material they are cutting, not fully closing scissors etc. • Choosing known geometric shapes when making. • Beginning to shape objects to improve how they work. • Making a structures according to design criteria.	Knowledge Technical • Recognising that different structures are used for different purposes. • Exploring the features of structures. • Making stable structures from card. • Creating supporting structures to aid stability. • Using stable objects like cylinders to create structures. • Building a strong and stiff structure by folding paper. • Folding to strengthen or stiffen. • Comparing the stability of different shapes. • Identifying the weakest part of a structure. • To know that shapes and structures with wide, flat bases or legs are the most stable. • To understand that the shape of a structure affects its strength. • To know that materials can be manipulated to improve strength and stiffness. • To know that a structure is something which has been formed or made from parts. • To know that a ‘stable’ structure is one which is firmly fixed and unlikely to change or move.

	• To know that a ‘strong’ structure is one which does not break easily. • To know that a ‘stiff’ structure or material is one which does not bend easily. Additional • To know that a design brief helps to decide what to make. • To know that design criteria are the steps for making a product successful. • To know that design criteria help when thinking of ideas. • To know that different products work in different ways and have parts that make them work. • To know some properties of materials like hard, soft, flexible, waterproof, strong etc. • To know the names of some geometric shapes, triangle, pyramid, square, cube, circle, sphere. • To know that existing products can be evaluated against design criteria. • To know that design criteria help to decide if their product is a success. • To know that improve means to make something better. • To know that a structure is something that has been made and put together. • To know that the shape of a structure affects its strength. • To know that materials can be manipulated to improve strength and stiffness. • To know that a ‘strong’ structure is one which does not break easily. • To know that a ‘stiff’ structure or material is one which does not bend easily. • To know that natural structures are those found in nature.

Design and Technology Curriculum Long Term Overview

	• To know that man-made structures are those made by people.
Year 3	
Skills Design • Creating simple design criteria that outline basic functionality and appeal to individual users or target audiences. • Beginning to use 2D CAD software to communicate their ideas. • Designing a castle with key features to appeal to a specific person/purpose. • Drawing and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours. • Designing and/or decorating a castle tower on CAD software. Make • Creating accurate shapes from templates. • Cutting out more complex shapes accurately. • Cutting out more complex shapes accurately. • Constructing a range of 3D geometric shapes using nets. • Creating special features for individual designs. • Making facades from a range of recycled materials. Evaluate • Explaining why they think certain aspects of a peer's design are effective or why they suggested specific improvements. • Explaining why they think certain aspects of a peer's design are effective or why they suggested specific improvements. • Explaining why they think certain aspects of a peer's design are effective or why they suggested specific improvements.	Knowledge Technical • Beginning to understand how different structures are built. • Beginning to understand how different structures are built. • Beginning to understand how different structures are built. • To understand that wide and flat based objects are more stable. • To understand the importance of strength and stiffness in structures. Additional • To know that creating accurate shapes improves how they look and sometimes their function. • To know good suggestions help give better feedback. • To know that they can choose to use feedback or not. • To know that a shell structure is a hollow shape with a thin outer layer. • To know that 3D shapes can form structures. • To know structures can be strengthened by manipulating materials and shapes. • To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose. • To know that a façade is the front of a structure. • To understand that a castle needed to be strong and stable to withstand enemy attack. • To know that a paper net is a flat 2D shape that can become a 3D shape once assembled.

Design and Technology Curriculum Long Term Overview

• Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design. • Suggesting points for modification of the individual designs.	• To know that a design specification is a list of success criteria for a product.

National curriculum - end of KS2

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

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

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

apply their understanding of how to strengthen, stiffen and reinforce more complex structures

understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)

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.

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.

Progression of Skills & knowledge

Structures

Year 4	
Skills Design • Creating simple design criteria that outline basic functionality and appeal to individual users or target audiences. • Noticing simple problems or needs in everyday life. • Developing drawing and sketching skills with a focus on clarity and simplicity. • Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect. • Building frame structures designed to support weight. Make • Selecting materials, components or ingredients based on their form as well as their functional properties. • Explaining choices with regard to function and form. • Choosing shapes to suit the function of a product. • Creating a range of different shaped frame structures. • Making a variety of free standing frame structures of different shapes and sizes. • Selecting appropriate materials to build a strong structure and cladding.	Knowledge Technical • Strengthening structures by layering materials (lamination). • Strengthening structures by ribbing. • To know how some different structures are built. • To know that structures can be strengthened by manipulating materials and shapes. • To know a shell structure is a hollow shape with a thin outer layer. • To understand what a frame structure is. • To know that a ‘free-standing’ structure is one which can stand on its own. Additional • To know form is the look and shape of something. • To know function is what something does and how it works. • To know that creating accurate shapes improves how they look and sometimes their function. • To know choices of materials and equipment can affect the final product. • To know that a pavilion is a decorative building or structure for leisure activities.

Design and Technology Curriculum Long Term Overview

• Reinforcing corners to strengthen a structure. • Creating a design in accordance with a plan. • Learning to create different textural effects with materials. Evaluate • Evaluating designs by comparing them against design criteria. • Considering feedback from peers to suggest improvements. • Evaluating how effective the chosen materials were in fulfilling the design brief. • Evaluating structures made by the class. • Describing what characteristics of a design and construction made it the most effective. • Considering effective and ineffective designs.	• To know that cladding can be applied to structures for different effects. • To know that aesthetics are how a product looks. • To know that a product's function means its purpose. • To understand that the target audience means the person or group of people a product is designed for. • To know that architects consider light, shadow and patterns when designing.
Year 5	
Skills Design • Designing a stable structure that is able to support weight. • Creating a frame structure with a focus on triangulation. Make • Making a range of different shaped beam bridges. • Using triangles to create truss bridges that span a given distance and support a load. • Building a wooden bridge structure. • Independently measuring and marking wood accurately. • Selecting appropriate tools and equipment for particular tasks. • Using the correct techniques to saws safely. • Identifying where a structure needs reinforcement and using card corners for support.	Knowledge Technical • To understand some different ways to reinforce structures. • To understand how triangles can be used to reinforce bridges. • To know that properties are words that describe the form and function of materials. • To understand why material selection is important based on properties. • To understand the material (functional and aesthetic) properties of wood. Additional • To understand the difference between arch, beam, truss and suspension bridges. • To understand how to carry and use a saw safely.

Design and Technology Curriculum Long Term Overview

• Explaining why selecting appropriating materials is an important part of the design process. • Understanding basic wood functional properties. Evaluate • Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary. • Suggesting points for improvements for own bridges and those designed by others.	

National curriculum - end of KS2

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

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

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

apply their understanding of how to strengthen, stiffen and reinforce more complex structures

understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)

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.

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.

Design and Technology Curriculum Long Term Overview

Progression of Skills & knowledge

Structures

Year 6	
Skills Design • Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs. • Identifying more complex problem statements that consider multiple factors and constraints with guidance. • Developing more independence in generating ideas. • Coming up with a broader range of ideas and deeper innovation, requiring pupils to think critically about their ideas' practicality and originality. • Using 3D CAD software to communicate their ideas. • Using a series of prototypes to refine and improve their designs. Make • Building a range of play apparatus structures drawing upon new and prior knowledge of structures. • Measuring, marking and cutting wood to create a range of structures. • Using a range of materials to reinforce and add decoration to structures.	Knowledge Technical • To know that structures can be strengthened by manipulating materials and shapes. • Understanding how to reinforce structures to make them more stable. • Using triangulation to strengthen or stabilise a structure. • To know that constraints are limits or conditions when making a product. • To know that the environmental impact is how the product and making the product might affect the environment. • To know that original and innovative ideas are different from what has been made before. • To know drawings and diagrams can be communicated in 3D. • To know that annotations are detailed labels and comments on diagrams. • To know that improving on prototypes can help to improve the final design. • To know that materials and equipment lists help with planning. • To know aesthetics are the way something looks.

Design and Technology Curriculum Long Term Overview

- Producing lists of equipment, materials and tools that they need for a task.
- Selecting materials, components or ingredients based on research or user needs.
- Assessing risks associated with different tools and equipment.
- Understanding and explaining the importance of each safety rule.
- Consistently apply safety instructions.
- Using a ruler to accurately measure and draw lines and marks.
- In small groups, cutting harder wood with a saw.
- Cutting in a back-and-forth sawing motion where appropriate.
- Balancing aesthetics and functionality when creating parts of a design.
- Considering when best to apply finishing effects.

Evaluate

- Improving a design plan based on peer evaluation.
- Testing and adapting a design to improve it as it is developed.
- Identifying what makes a successful structure.
- Reflecting on the usability, aesthetics, innovation and sustainability of products and discussing how design choices impact these aspects.
- Assessing their designs against a more complex set of design criteria that includes functionality, aesthetics, user experience, sustainability and cost.
- Considering alternative materials, tools or techniques that could enhance the product.

- To know that risks are things that might go wrong.
- To know the shape of an object can affect both its aesthetics and function.
- To know aesthetics is how something looks.
- To know that the finish can make a product suitable to be used outside.

Additional

- To understand what a 'footprint plan' is.
- To understand that in the real world, design , can impact users in positive and negative ways.
- To know that a prototype is a cheap model to test a design idea.
- To know that sustainability means thinking about the materials that were used to make a product and how the product was made.
- To know that their final product can still be improved by using different materials or techniques.
- To know that evaluating their designs in detail will help them understand its successful and less successful parts.
- To know that a frame structure supports or holds a shape, and is made up of strong parts joined together, like a skeleton or a climbing frame.
- To know how to reinforce structures.
- To know triangles can be used to reinforce structures.
- To know triangles can create strong and stable structures.
- To know that bracing is a way of reinforcing a structure.

National curriculum - end of KS2

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

Design and Technology Curriculum Long Term Overview

generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

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

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

apply their understanding of how to strengthen, stiffen and reinforce more complex structures

understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)

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.

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.

Design and Technology Curriculum Long Term Overview

Progression of Skills & knowledge

Mechanisms / mechanical systems

Year 1	
Skills Design • Thinking about what others might want from a design. • Beginning to recognise how products and designs in the world around us solve certain needs. • Considering who they are designing for – by identifying the user. • Stating what they intend to make and why – by identifying the purpose • Talking about ideas with purpose and user in mind. • Talking about existing products when generating ideas. • Creating mock-ups to communicate designs. • Explaining how to adapt mechanisms, using bridges or guides to control the movement. • Designing a moving story book for a given audience. • Thinking about what others might want from a design. • Beginning to recognise how products and designs in the world around us solve certain needs. • Considering who they are designing for - by identifying the user. • Stating what they intend to make and why - by identifying the purpose.	Knowledge Technical • Recognising and exploring everyday objects that have mechanisms. • Recognising everyday objects that use a slider mechanism (e.g. drawers, sliding doors, paper trimmer). • To know that a mechanism is the parts of an object that move together. • To know that a slider mechanism moves an object from side to side. • To know that a slider mechanism has a slider, slots , guides and an object. • To know that bridges and guides are bits of card that purposefully restrict the movement of the slider. • Recognising and exploring everyday objects that have mechanisms. • Many things that move have parts inside to help them work. • Mechanisms usually limit unwanted movement. • An axle allows the wheel to turn without falling off. • To know that wheels need to be round to rotate and move. • To understand that for a wheel to move, it must be attached to a rotating axle.

Design and Technology Curriculum Long Term Overview

- Talking about ideas with purpose and user in mind.
- Talking about existing products when generating ideas.
- Using basic drawing skills to communicate ideas.
- Designing a vehicle that includes wheels, axles and axle holders, that when combined, will allow the wheels to move.
- Creating clearly labelled drawings that illustrate movement.

Make

- Planning more than one step ahead.
- Choosing between a small number of materials, ingredients or components.
- Explaining their choices based on personal experiences.
- Requesting equipment appropriate to the purpose. (e.g. scissors for cutting, glue for joining).
- Explaining in simple terms why certain tools must be handled carefully.
- Following and recalling simple safety instructions.
- Beginning to use objects with a fixed width or length to create even spacing of markings or cuts. (e.g. a lolly stick).
- Refining their grip to cut competently and confidently.
- Cutting straight lines and evenly spaced lines.
- Beginning to cut large shapes and thicker materials like card.
- Puncturing holes
- Applying masking tape to fix something in place or join to edges.
- Using tools, like scissors, to create shapes.
- Beginning to cut large shapes and thicker materials like card.
- Following a design to create moving models that use levers and sliders.
- Planning more than one step ahead.

- To know that an axle moves within an axle holder which is fixed to the vehicle or toy.
- To know that the frame of a vehicle (chassis) needs to be balanced.

Additional

- To know that the 'user' is the person who will use the product
- To know that different users may want different things from a design.
- To know that designers usually design and make something to solve a problem.
- To know that who they are designing for makes a difference to what they design.
- To know that the purpose is what something is for.
- To know that a mock-up is a model of how something works.
- To know that choosing different materials or components will have an effect on what their product does or looks like.
- To know that different equipment does different things.
- To know the names of common pieces of equipment.
- To know that some tools are sharp like scissors and knives.
- To know that following instructions helps with safety.
- To know that cutting in a straight line can be helpful when making.
- To know that some products will be better than others.
- To know that their ideas or products can be made better.
- To know that many things that move have parts inside to help them work.
- To know that mechanisms usually limit unwanted movement.
- To know that a slider mechanism moves an object in a straight line (e.g. left/right, up/down).
- To know that sliding mechanisms are designed to keep movement in one direction (e.g. using guides/rails etc).

Design and Technology Curriculum Long Term Overview

• Choosing between a small number of materials, ingredients or components. • Explaining their choices based on personal experiences. • Requesting equipment appropriate to the purpose (e.g. scissors for cutting and glue for joining). • Explaining in simple terms why certain tools must be handled carefully. • Following and recalling simple safety instructions. • Finding the middle of an object. • Refining their grip to cut competently and confidently. • Cutting straight lines and evenly spaced lines. • Beginning to cut large shapes and thicker materials like card. • Puncturing holes. • Recognising the edges of paper and card need to be stuck firmly using a glue stick. • Using tools, like scissors, to create shapes. • Beginning to cut large shapes and thicker materials like card. • Beginning to use controlled painting or colouring techniques to finish a product. • Adding texture to create visual interest. • Adapting mechanisms: - when they do not work as they should; - to fit their vehicle design; -to improve how they work after testing their vehicle. Evaluate • Discussing existing products, saying what they like about them. • Discussing how their products could be improved based on personal preferences. • Saying what they like about their peers' designs and products.	• To know that in Design and technology we call a plan a 'design'. • To know that the 'user' is the person who will use the product. • To know that different users may want different things from a design. • To know that designers usually design and make something to solve a problem. • To know that who they are designing for makes a difference to what they design. • To know that the purpose is what something is for. • To know that existing products can help when deciding what to design. • To know that drawings are a way to explain ideas. • To know that a plan is deciding what to do first and next. • To know that choosing different materials or components will have an effect on what their product does or looks like. • To know that different equipment does different things. • To know the names of common pieces of equipment. • To know that some tools are sharp like scissors and knives. • To know that following instructions helps with safety. • To know that cutting in a straight line can be helpful when making. • To know that tools can be used to shape objects. • To know that different materials can be shaped by different tools. • To know that some products will be better than others. • To know that their ideas or products can be made better. • To know that their final product might be different to their original idea. • To know that their ideas can make someone else's work better. • To know that other people's ideas can help make their work better.

Design and Technology Curriculum Long Term Overview

• Accepting feedback and understanding it is meant to improve their work. • Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed. • Reviewing the success of a product by testing it with its intended audience. • Discussing existing products, saying what they like about them. • Comparing two products and discussing which is better for a specific purpose. • Discussing how their products could be improved based on personal preferences. • Comparing their finished products with their original designs. • Saying what they like about their peers' designs and products. • Accepting feedback and understanding it is meant to improve their work. • Testing wheel and axle mechanisms, identifying what stops the wheels from turning and recognising that a wheel needs an axle in order to move.	• To know some real-life items that use wheels such as wheelbarrows, hamster wheels and vehicles.
Year 2	
Skills Design • Conducting simple surveys or discussions to gather opinions on what others need or like in a design. • Knowing that a survey is used to find out what people like. • Using a simple design brief that outlines the intended use, target user, and key features of the product, to create simple design criteria. • Knowing that a design brief helps to decide what to make.	Knowledge Technical • To know everyday objects have mechanisms. • To know many things that move have parts inside to help them work. • To know mechanisms usually limit unwanted movement. • To know everyday objects utilise wheels and axles. • To know wheels must be able to turn to work effectively. • To know axles allow wheels to turn without falling off.

Design and Technology Curriculum Long Term Overview

- Knowing that design criteria are the steps for making a product successful.
- Creating ideas with design criteria in mind.
- Referring to specific parts of existing products when generating ideas.
- Knowing that the design criteria help when thinking of ideas.
- Using labels to explain parts of a design, label materials, etc.
- Using labels to explain parts of a design, label materials, etc.
- Knowing that drawings can help explain how something works.
- Knowing that a label explains part of a drawing.
- Creating a class design criteria for a moving monster.
- Designing a moving monster for a specific audience in accordance with a design criteria.
- Creating ideas with design criteria in mind.
- Referring to specific parts of existing products when generating ideas.
- Using labels to explain parts of a design, label materials etc, including using ICT.
- Integrating moving parts when creating mock-ups.

Make

- Choosing materials, ingredients or components from a wider range of materials, ingredients or components.
- Explaining their choices based on the properties of materials and components.
- Knowing some properties of materials like hard, soft, flexible, waterproof, strong etc.
- Following and recalling simple safety instructions.
- Knowing that some tools are sharp like scissors and knives.
- Choosing known geometric shapes when making.
- Beginning to shape objects to improve how they work.

- To know that mechanisms are a collection of moving parts that work together as a machine to produce movement.
- To know that there is always an input and output in a mechanism.
- To know that an input is the energy that is used to start something working.
- To know that an output is the movement that happens as a result of the input.
- To know that a lever is something that turns on a pivot.
- To know that a linkage mechanism is made up of a series of levers.
- Recognising and exploring everyday objects that have mechanisms.
- Exploring everyday objects that use levers (e.g scissors, tongs, door handle, stapler).

Additional

- To know the features of a fairground wheel include the wheel, frame, pods, a base an axle and an axle holder.
- To know some real-life objects that contain mechanisms.
- To know that different products work in different ways and have parts that make them work.
- To know drawings can help explain how something works.
- To know many things that move have parts inside to help make them work.
- To know some properties of materials, e.g., hard, soft, flexible, waterproof, strong, etc.
- To know some pieces of equipment are better suited to certain jobs.
- To know some tools are sharp like scissors and knives.
- To know following instructions helps with safety.
- To know many things that move have parts inside to help them work.
- To know mechanisms usually limit unwanted movement.

• Knowing the names of some geometric shapes: triangle, pyramid, square, cube, circle, sphere. • Considering balance in their finishing, like evenly spaced decoration. • Making linkages using card for levers and split pins for pivots. • Experimenting with linkages adjusting the widths, lengths and thicknesses of card used. • Cutting and assembling components neatly. • Integrating moving parts when creating mock-ups. • Planning more than one step ahead. • Choosing materials or components from a wider range of materials or components. • Choosing between pieces of equipment that are used for the same purpose (e.g. joining) and explaining why their choice suits the task. • Explaining their choices based on the properties of materials and components. • Following and recalling simple safety instructions. Evaluate • Discussing a range of existing products and saying what they like and dislike about them. • Evaluating existing products against design criteria. • Evaluating their ideas and creations against simple design criteria. • Knowing that design criteria help to decide if their product is a success. • Suggesting improvements to their peers' designs and products. • Knowing that improve means to make something better. • Knowing that their suggestions can improve someone else's work. • Evaluating own designs against design criteria. • Using peer feedback to modify a final design.	• To know a pivot is the part that a lever moves around.

Design and Technology Curriculum Long Term Overview

• Discussing whether they were able to use the tools and techniques effectively. • Comparing a range of products and explaining why some better meet different design criteria than others. • Evaluating their ideas and creations against simple design criteria.	

National curriculum - end of KS1

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

select from and use a range of tools and equipment to perform practical tasks

select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics

explore and evaluate a range of existing products

evaluate their ideas and products against design criteria

build structures, exploring how they can be made stronger, stiffer and more stable

explore and use mechanisms in their products.

use the basic principles of a healthy and varied diet to prepare dishes

understand where food comes from.

Progression of Skills & knowledge

Mechanisms / mechanical systems

Year 3	
Skills Design • Creating simple design criteria that outline basic functionality and appeal to individual users or target audiences. • Taking part in structured idea blasting sessions. • Coming up with more ideas and considering the feasibility of their ideas in the classroom. • Developing drawing and sketching skills with a focus on clarity and simplicity. • Developing designs by adding detail and justifications about materials, tools, methods. • Beginning to recognise the benefit of a range of diagram types or prototypes to communicate ideas. (e.g. sketches, cross-sectional diagram, thumbnail sketches and exploded diagrams). • Designing a toy which uses a pneumatic system. • Developing design criteria from a design brief. • Generating ideas using thumbnail sketches and exploded diagrams. • Learning that different types of drawings are used in design to explain ideas clearly. Make	Knowledge Technical • Beginning to understand how mechanisms work. • Recognising pneumatic systems in everyday objects (e.g. car boot, adjustable chair.) • To understand how pneumatic systems work. • To understand that pneumatic systems can be used as part of a mechanism. • To know that pneumatic systems operate by drawing in, releasing and compressing air. Additional • To know that a problem or need is something that a designer can help to solve. • To know that extra information on drawings or diagrams can help the user understand a design or idea. • To know that thumbnail sketches are less detailed quick sketches. • To know that a cross-sectional diagram shows the inside of a product. • To know that an exploded diagram shows how the parts of a product fit together.

Design and Technology Curriculum Long Term Overview

• Selecting equipment required for a series of tasks based on the plan. Explain why each piece is suitable for each stage. • Suggesting simple safety rules based on their understanding of tool dangers. • Participating in discussions about classroom safety procedures. • Cutting out more complex shapes accurately. • Handle different sizes and types of scissors with confidence. • Using PVA glue to join corrugated card and light wood (e.g. balsa wood). • Choosing shapes to suit the function of a product. • Painting or colouring precisely to improve the finish. • Making facades from a range of materials. • Sealing edges with tape to cover gaps in joins. • Creating a pneumatic system to create a desired motion. • Building secure housing for a pneumatic system. • Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy. • Selecting materials due to their functional and aesthetic characteristics. • Manipulating materials to create different effects by cutting, creasing, folding and weaving. Evaluate • Analysing why specific products, designers or inventors are successful. • Evaluating their designs by comparing them against design criteria and considering feedback from peers to suggest improvements. • Explaining why they think certain aspects of a peer's design are effective or why they suggested specific improvements.	• To know that different pieces of equipment will be used at different stages in a plan. • To know that different tools and equipment have different dangers. • To know that scissors are useful for cutting out complex shapes. • To know that designers and inventors create products. • To know that choices of materials and equipment can affect the final product. • To know that feedback is ideas and suggestions from other people that can help improve their work. • To know that they can choose to use feedback or not. • To understand that a mechanical system can allow us to move something more easily. • To know that mechanical systems have more than one mechanism that moves to make them work. • To know that mechanical systems are often hidden in products to make them look more appealing. • To know that pushing air can be used to move a mechanism. • To know that pivots can be used to create more movement in the mechanical system. • To know that a combination of mechanisms can improve a product. • To understand how sketches, drawings and diagrams can be used to communicate design ideas. • To know that exploded-diagrams are used to show how different parts of a product fit together. • To know that thumbnail sketches are small drawings to get ideas down on paper quickly.

Design and Technology Curriculum Long Term Overview

• Reflecting on feedback to decide if and how it could be used to improve future iterations. • Using the views of others to improve designs. • Testing and modifying the outcome, suggesting improvements. • Understanding the purpose of exploded-diagrams through the eyes of a designer and their client.	
Year 4	
Skills Design • Taking part in structured brainstorming sessions. • Developing drawing and sketching skills with a focus on clarity and simplicity. • Beginning to recognise the benefit of a range of diagram types or prototypes to communicate ideas. (e.g. sketches, cross-sectional diagram, thumbnail sketches and exploded diagrams) • Creating prototypes using materials with similar properties to their final design. • Creating simple design criteria that outline basic functionality and appeal to individual users or target audiences. • Developing designs by adding detail and justifications about materials, tools, methods. Make • Following detailed safety instructions. • Using a ruler as a measuring tool with increasing accuracy by creating spaced marks using millimetres and measuring lengths of objects. • Handle different sizes and types of scissors with confidence.	Knowledge Technical • To understand that a mechanical system can allow us to move something more easily. • To know that mechanical systems have more than one mechanism that moves to make them work. • To know that mechanical systems are often hidden in products to make them look more appealing. Additional • To know that extra information on drawings or diagrams can help the user understand a design or idea. • To know that an exploded diagram shows how the parts of a product fit together. • To know that a prototype is a detailed model that helps a user understand how a product will work. • To know that a target audience is a group of people that might like the idea. • To know that different tools and equipment have different dangers. • To know that a ruler can be used to measure length. • To know that a hot glue gun can be used to join materials.

Design and Technology Curriculum Long Term Overview

• With close supervision using a hot glue gun to join wooden materials (e.g. lolly sticks). • Selecting equipment required for a series of tasks based on the plan. Explain why each piece is suitable for each stage. • Selecting materials, components or ingredients from a wider choice but within a limited design space (e.g. seasonal ingredients from May and June in the UK). Evaluate • Explaining why they think certain aspects of a peer's design are effective or why they suggested specific improvements. • Reflecting on feedback to decide if and how it could be used to improve future iterations. • Investigating and analysing a range of existing products by looking at their functionality and appeal. • Analysing why specific products, designers or inventors are successful. • Evaluating their designs by comparing them against design criteria and considering feedback from peers to suggest improvements. • Evaluating how effective their chosen materials and tools were in fulfilling the design brief.	• To know that better suggestions of improvements mean better feedback. • To know that they can choose to use feedback or not. • To know that some products are more successful than other because of their function. • To know that choices of materials and equipment can affect the final product. • To know that feedback is ideas and suggestions from other people that can help improve their work.

National curriculum - end of KS2

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

select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately

Design and Technology Curriculum Long Term Overview

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

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

apply their understanding of how to strengthen, stiffen and reinforce more complex structures

understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)

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.

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.

Design and Technology Curriculum Long Term Overview

Progression of Skills & knowledge

Mechanisms / mechanical systems

Year 5	
Skills Design • Noticing wider-reaching problems or needs in the community. • Identifying a wide range of needs and potential barriers through market research. • Writing more complex problem statements that consider multiple factors and constraints. • Creating more complex design criteria that require considering detailed user needs, environmental impact, materials and cost. • Coming up with a broader range of ideas and deeper innovation, requiring pupils to think critically about their ideas' practicality and originality. • Beginning to use more complex annotated sketches, such as cross-sectional and exploded diagrams and pattern pieces in design. • Using a series of prototypes to refine and improve their designs. Make • Consistently apply safety instructions. • Select appropriate scissors to handle delicate cutting tasks and challenging materials. • Cutting patterns and drawings accurately.	Knowledge Technical • That mechanical systems that use gears in everyday objects (e.g. bicycle, clock). • That gears and pulleys allow us to transfer movement and force from one part of a mechanical system to another. • That gears allow us to increase the output of a mechanism. Additional • That market research is a way of collecting information about problems or needs. • That constraints are things that might stop our ideas being successful. • That original and innovative ideas are different from what has been made before. • That annotations are detailed labels and comments on diagrams. • That risks are things that might happen. • That hot glue creates a strong bond quickly. • That is often better to choose safer equipment. • That sustainability means thinking about the materials that were used to make a product and how the product was made.

Design and Technology Curriculum Long Term Overview

• In supervised groups, using hot glue guns safely. • Recognising that hot glue is useful for joining materials that need a strong bond that sets quickly. • Choosing PVA glue over hot glue for its safety when joining materials in less intensive projects. Evaluate • Reflecting on the usability, aesthetics, innovation and sustainability of products and discussing how design choices impact these aspects. • Assessing their designs against a more complex set of design criteria that includes functionality, aesthetics, user experience, sustainability and cost. • Considering alternative materials, tools or techniques that could enhance the product. • Providing feedback that is helpful, specific, and encouraging. • Incorporating feedback from peers or users improves their product further, explaining the changes they made and the impact they had.	• That their final product can still be improved by different materials or techniques. • That evaluating their designs in detail will help them understand its successful and less successful parts. • That feedback should be positive, helpful and specific. • That explaining how they used feedback to improve their design can help them create better products in the future.
Year 6	
Skills Design • Noticing wider-reaching problems or needs in the community. • Coming up with a broader range of ideas and deeper innovation, requiring pupils to think critically about their ideas' practicality and originality. • Beginning to use more complex annotated sketches, such as cross-sectional and exploded diagrams and pattern pieces in design. Make	Knowledge Technical • To know that the mechanism in an automata uses a system of cams, axles and followers. • To know that different shaped cams produce different outputs. • To know which mechanisms are working together to make a mechanical system. • To know that there are different directions of movement. • To know that mechanisms can change one type of movement to another.

Design and Technology Curriculum Long Term Overview

- Producing lists of equipment, materials and tools that they need for a task.
- Selecting materials, components or ingredients based on research or user needs.
- Explaining their choices, referring to their research.
- Considering which equipment will work well together.
- Choosing from the known range of equipment available to them with little guidance.
- Assessing risks associated with different tools and equipment.
- Understanding and explaining each safety rule's importance.
- Consistently apply safety instructions.
- Cutting jelutong or other harder wood with a coping saw or a tenon saw in small groups.
- Cutting in a back-and-forth sawing motion where appropriate.
- In supervised groups, using hot glue guns safely.
- Recognising that hot glue is useful for joining materials that need a strong bond that sets quickly.

Evaluate

- Assessing their designs against a more complex set of design criteria that includes functionality, aesthetics, user experience, sustainability and cost.
- Providing feedback that is helpful, specific and encouraging.
- Incorporating feedback from peers or users to improve their product further, explaining the changes they made and the impact they had.

Additional

- To know that an automata is a hand powered mechanical toy.
- To know that a cross-sectional diagram shows the inner workings of a product.

National curriculum - end of KS2

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

Design and Technology Curriculum Long Term Overview

generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

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

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

apply their understanding of how to strengthen, stiffen and reinforce more complex structures

understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)

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.

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.

Progression of Skills & knowledge

Electrical systems (KS2 only)

Year 3	
Skills Design • Carry out research based on a given topic (e.g. The Romans) to develop a range of initial ideas. • Generate a final design for the electric poster with consideration to the client's needs and design criteria. • Design an electric poster that fits the requirements of a given brief. • Plan the positioning of the bulb (circuit component) and its purpose. Make • Create a final design for the electric poster. • Mount the poster onto corrugated card to improve its strength and allow it to withstand the weight of the circuit on the rear. • Measure and mark materials out using a template or ruler. • Fit an electrical component (bulb). • Learn ways to give the final product a higher quality finish (e.g. framing to conceal a roughly cut edge). Evaluate • Learning to give and accept constructive criticism on own work and the work of others.	Knowledge Technical • To understand that an electrical system is a group of parts (components) that work together to transport electricity around a circuit. • To understand common features of an electric product (switch, battery or plug, dials, buttons, etc.). • To list examples of common electric products (kettle, remote control etc.). • To understand that an electric product uses an electrical system to work (function). • To know the name and appearance of a bulb, battery, battery holder and crocodile wire to build simple circuits. Additional • To understand the importance and purpose of information design. • To understand how material choices (such as mounting paper to corrugated card) can improve a product to serve its purpose (remain rigid without bending when the electrical circuit is attached).

Design and Technology Curriculum Long Term Overview

• Testing the success of initial ideas against the design criteria and justifying opinions. • Revisiting the requirements of the client to review developing design ideas and check that they fulfil their needs	
Year 4	
Skills Design • Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas. Make • Making a torch with a working electrical circuit and switch. • Using appropriate equipment to cut and attach materials. • Assembling a torch according to the design and success criteria. Evaluate • Evaluating electrical products. • Testing and evaluating the success of a final product.	Knowledge Technical • To understand that electrical conductors are materials which electricity can pass through. • To understand that electrical insulators are materials which electricity cannot pass through. • To know that a battery contains stored electricity that can be used to power products. • To know that an electrical circuit must be complete for electricity to flow. • To know that a switch can be used to complete and break an electrical circuit. Additional • To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens. • To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison.
National curriculum - end of KS2 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	

Design and Technology Curriculum Long Term Overview

generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

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

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

apply their understanding of how to strengthen, stiffen and reinforce more complex structures

understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)

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.

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.

Progression of Skills & knowledge

Electrical systems (KS2 only)

Year 5

Skills Design

- Creating more complex design criteria that require considering detailed user needs, environmental impact, materials and cost.
- Developing more independence in generating ideas.
- Coming up with a broader range of ideas and deeper innovation, requiring pupils to think critically about their ideas' practicality and originality.
- Using a series of prototypes to refine and improve their designs.
- Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product.
- Developing design criteria based on findings from investigating existing products.
- Developing design criteria that clarifies the target user.

Make

- Producing lists of equipment, materials and tools that they need for a task.
- Creating a step-by-step plan for making.

Knowledge Technical

- Beginning to understand that electricity flows around a circuit.
- Using different components to produce different results from electrical systems.
- Creating working electrical circuits with a wider variety of electrical components.
- Deconstructing electrical systems to understand how they work.
- To know that series circuits only have one direction for the electricity to flow.
- To know when there is a break in a series circuit, all components turn off.
- To know that an electric motor converts electrical energy into rotational movement, causing the motor’s axle to spin.
- To know a motorised product is one which uses a motor to function.

Additional

- To know environmental impact is how the product and making the product might affect the environment.
- To know original and innovative ideas are different from what has been made before.

Design and Technology Curriculum Long Term Overview

• Selecting materials, components or ingredients based on research or user needs. • Explaining their choices, referring to their research. • Understanding and explaining each safety rule's importance. • Consistently apply safety instructions. • Balancing aesthetics and functionality when creating parts of a design. • Considering when best to apply finishing effects. • Altering a product's form and function by tinkering with its configuration. • Making a functional series circuit, incorporating a motor. • Constructing a product with consideration for the design criteria. • Breaking down the construction process into steps so that others can make the product. Evaluate • Reflecting on the usability, aesthetics, innovation and sustainability of products and discussing how design choices impact these aspects. • Assessing their designs against a more complex set of design criteria that includes functionality, aesthetics, user experience, sustainability and cost. • Considering alternative materials, tools or techniques that could enhance the product. • Providing feedback that is helpful, specific, and encouraging. • Incorporating feedback from peers or users to improve their product further, explaining the changes they made and the impact they had. • Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses.	• To know annotations are detailed labels and comments on diagrams. • To know improving on prototypes can help to improve the final design. • To know materials and equipment lists help to plan better. • To know research can help decide which materials are best for both aesthetics and functional properties. • To know some equipment can work well with other equipment. • To know risks are things that might go wrong. • To know the shape of an object can affect both its aesthetics and function. • To know sustainability means thinking about the materials that were used to make a product and how the product was made. • To know looking at other designers work can help inform designs. • To know their final product can still be improved by using different materials or techniques. • To know evaluating their designs in detail will help them understand its successful and less successful parts. • To know feedback should be positive, helpful and specific. • To know that explaining how they used feedback to improve their design can help them create better products in the future. • To know an electric motor converts electricity into rotational movement. • To know a motorised product is one which uses a motor to function. • To know the names of components that can form an electrical system. • To know that product analysis is critiquing the strengths and weaknesses of a product.

Design and Technology Curriculum Long Term Overview

• Determining which parts of a product affect its function and which parts affect its form. • Analysing whether changes in configuration positively or negatively affect an existing product. • Peer evaluating a set of instructions to build a product.	• To know that 'configuration' means how the parts of a product are arranged.
Year 6	
Skills Design • Designing a steady hand game - identifying and naming the components required. • Drawing a design from three different perspectives. • Generating ideas through sketching and discussion. • Modelling ideas through prototypes. • Understanding the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'. Make • Constructing a stable base for a game. • Accurately cutting, folding and assembling a net. • Decorating the base of the game to a high quality finish. • Making and testing a circuit. • Incorporating a circuit into a base. Evaluate • Testing own and others finished games, identifying what went well and making suggestions for improvement. • Gathering images and information about existing children's toys. • Analysing a selection of existing children's toys.	Knowledge Technical • To know that batteries contain acid, which can be dangerous if they leak. • To know the names of the components in a basic series circuit, including a buzzer. Additional • To know that 'form' means the shape and appearance of an object. • To know the difference between 'form' and 'function'. • To understand that 'fit for purpose' means that a product works how it should and is easy to use. • To know that form over purpose means that a product looks good but does not work very well. • To know the importance of 'form follows function' when designing: the product must be designed primarily with the function in mind. • To understand the diagram perspectives 'top view', 'side view' and 'back'.

Design and Technology Curriculum Long Term Overview

National curriculum - end of KS2

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

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

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

apply their understanding of how to strengthen, stiffen and reinforce more complex structures

understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)

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.

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.

Progression of Skills & knowledge

Cooking and nutrition

EYFS	
Skills Design • Designing a soup recipe as a class. • Designing soup packaging. Make • Chopping plasticine safely. • Chopping vegetables with support. Evaluate • Tasting the soup and giving opinions. • Describing some of the following when tasting food: look, feel, smell and taste. • Choosing their favourite packaging design and explaining why.	Knowledge • To know that soup is ingredients (usually vegetables and liquid) blended together. • To know that vegetables are grown. • To recognise and name some common vegetables. • To know that different vegetables taste different. • To know that eating vegetables is good for us. • To discuss why different packages might be used for different foods.
Year 1	
Skills Design • Designing smoothie carton packaging by-hand. • Learning where and how fruits and vegetables grow. Make • Chopping fruit and vegetables safely to make a smoothie.	Knowledge • To know that a blender is a machine which mixes ingredients together into a smooth liquid. • To know that a fruit has seeds and a vegetable does not. • To know that fruits grow on trees or vines.

Design and Technology Curriculum Long Term Overview

• Juicing fruits safely to make a smoothie. • Identifying if a food is a fruit. Evaluate • Tasting and evaluating different food combinations. • Describing appearance, smell and taste. • Suggesting information to be included on packaging. • Comparing their own smoothie with someone else's.	• To know that vegetables can grow either above or below ground. • To know that a vegetable is any edible part of a plant.

National curriculum - end of KS1

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

select from and use a range of tools and equipment to perform practical tasks

select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics

explore and evaluate a range of existing products

evaluate their ideas and products against design criteria

build structures, exploring how they can be made stronger, stiffer and more stable

explore and use mechanisms in their products.

use the basic principles of a healthy and varied diet to prepare dishes

understand where food comes from.

Progression of Skills & knowledge

Cooking and nutrition

Year 2	
Skills Design • Designing three wrap ideas. Make • Chopping foods safely to make a wrap. • Constructing a wrap that meets a design brief. • Grating foods to make a wrap. • Snipping smaller foods instead of cutting. • Spreading soft foods to make a wrap. • Identifying the five food groups. • Learning about a balanced diet. Evaluate • Describing appearance, smell and taste. • Tasting and evaluating different food combinations. • Describing the information that should be included on a label.	Knowledge • To know that 'diet' means the food and drink that a person or animal usually eats. • To know what makes a balanced diet. • To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar. • To know that I should eat a range of different foods from each food group, and roughly how much of each food group. • To know that 'ingredients' means the items in a mixture or recipe. • To know how to cut, grate, snip and spread to prepare foods. • To know how to review and give a score to evaluate.
Year 3	
Skills Design • Describing how climate affects where foods grow.	Knowledge

Design and Technology Curriculum Long Term Overview

Make • Identifying seasonal ingredients from the UK. • Following the instructions within a recipe. • Tasting seasonal ingredients. • Peeling foods by hand or with a peeler. • Cutting ingredients safely. • Choosing ingredients based on a design brief. Evaluate • Describing the texture and flavour of ingredients. • Describing the benefits of seasonal fruits and vegetables and the impact on the environment.	• To know that seasonal means foods that grow in a given season in a given country. • To know some seasonal foods that grow in the UK and what season they grow in. • To know that eating seasonal foods can have a positive impact on the environment. • To know how to describe the flavour and texture of foods. • To know how to cut and peel safely. • To know that the appearance of food is as important as taste. • To know that similar coloured fruits and vegetables often have similar nutritional benefits.

National curriculum - end of KS2

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

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

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

apply their understanding of how to strengthen, stiffen and reinforce more complex structures

understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)

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.

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.

Progression of Skills & knowledge

Cooking and nutrition

Year 4	
Skills Design • Designing a biscuit within a given budget. • Conducting market research. Make • Following a baking recipe • Understanding safety and hygiene rules. • Adapting a recipe. Evaluate • Evaluating an adapted recipe. • Evaluating and comparing a range of products. • Suggesting modifications.	Knowledge • To know that the amount of an ingredient in a recipe is known as the 'quantity.' • To know that safety and hygiene are important when cooking. • To know the following cooking techniques: sieving, measuring, stirring, cutting out and shaping. • To know the importance of budgeting while planning ingredients for a recipe. • To know that products often have a target audience.
Year 5	
Skills Design • Researching existing recipes. • Suggesting alternative ingredients. • Designing a jar label. Make	Knowledge • To know that beef comes from cows reared on farms. • To know that recipes can be adapted to suit nutritional needs and dietary requirements. • To know that nutritional information is found on food packaging.

Design and Technology Curriculum Long Term Overview

• Writing an alternative recipe. • Understanding cross-contamination. • Using preparation skills. • Making a developed recipe. Evaluate • Explaining the farm to fork process. • Analysing nutritional content.	• To know that coloured chopping boards can prevent cross-contamination. • To know that food packaging serves many purposes.

National curriculum - end of KS2

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

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

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

apply their understanding of how to strengthen, stiffen and reinforce more complex structures

understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)

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.

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.

Progression of Skills & knowledge

Cooking and nutrition

Year 6	
Skills Design • Writing a recipe, explaining the key steps, method and ingredients. • Including facts and drawings from research undertaken. Make • Following a recipe, including using the correct quantities of each ingredient. • Adapting a recipe based on research. • Working to a given timescale. • Working safely and hygienically with independence. Evaluate • Evaluating a recipe, considering: taste, smell, texture and origin of the food group. • Taste testing and scoring final products. • Suggesting and writing up points of improvements in productions. • Evaluating health and safety in production to minimise cross contamination.	Knowledge • To know that 'flavour' is how a food or drink tastes. • To know that many countries have 'national dishes' which are recipes associated with that country. • To know that 'processed food' means food that has been put through multiple changes in a factory. • To understand that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides. • To understand what happens to a certain food before it appears on the supermarket shelf (Farm to Fork).
National curriculum - end of KS2	

Design and Technology Curriculum Long Term Overview

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

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

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

apply their understanding of how to strengthen, stiffen and reinforce more complex structures

understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)

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.

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.

Design and Technology Curriculum Long Term Overview

Progression of Skills & knowledge

Textiles

EYFS	
Skills Design • Discussing what a good design needs. • Designing a simple pattern with paper. • Designing a bookmark. • Choosing from available materials. Make • Developing fine motor/cutting skills with scissors. • Exploring fine motor/threading and weaving (under, over technique) with a variety of materials. • Using a prepared needle and wool to practise threading. Evaluate • Reflecting on a finished product and comparing to their design	Knowledge • To know that a design is a way of planning our idea before we start. • To know that threading is putting one material through an object.
Year 1	
Skills Design • Stating what they intend to make and why - identifying the purpose. • Talking about ideas, with purpose and user in mind. • Using basic drawing skills to communicate ideas.	Knowledge Technical • Discussing fabric properties. • Threading large needles.

Design and Technology Curriculum Long Term Overview

• Using a template to create a design for a puppet. Make • Choosing between a small number of materials, ingredients or components. • Explaining their choices based on personal experiences. • Explaining in simple terms why certain tools must be handled carefully. • Following and recalling simple safety instructions. • Using a straightedge to draw a straight line. • Beginning to use objects with a fixed width or length to create even spacing of markings or cuts. (e.g. a lolly stick). • Using a large plastic needle and large-weave embroidery fabric to begin to create a running stitch. • Applying masking tape to fix something in place or join to edges. • Adding texture to create visual interest. • Cutting fabric neatly with scissors. • Using joining methods to decorate a puppet. • Sequencing steps for construction. Evaluate • Saying what they like about their peers' designs and products. • Accepting feedback and understanding it is meant to improve their work. • Reflecting on a finished product, explaining likes and dislikes.	• Rehearsing sewing techniques with large needles and thick thread, like wool. • Sewing a running stitch in large-weave embroidery fabric or hessian. • Creating patterns and following them with stitching. • Spacing stitches evenly. • To know drawings are a way to explain ideas. • To know that choosing different materials or components will affect what the product does or looks like. • To know the names of common pieces of equipment. • To know that following instructions helps with safety. • To know that spacing cuts or marks evenly can be useful. • To know that exture is how something feels. • To know their ideas or products can be made better. • To know their final product might be different to their original idea. • To know their ideas can make someone else's work better. • To know other people's ideas can help make their work better. • To know evenly spaced stitches help when following a pattern. • To know that 'joining technique' means connecting two pieces of material together. • To know that there are various temporary methods of joining fabric by using staples, glue or pins. • To understand that different techniques for joining materials can be used for different purposes. • To understand that a template (or fabric pattern) is used to cut out the same shape multiple times. • To know that drawing a design idea is useful to see how an idea will look. www.kapow

Design and Technology Curriculum Long Term Overview

National curriculum - end of KS1

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

select from and use a range of tools and equipment to perform practical tasks

select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics

explore and evaluate a range of existing products

evaluate their ideas and products against design criteria

build structures, exploring how they can be made stronger, stiffer and more stable

explore and use mechanisms in their products.

use the basic principles of a healthy and varied diet to prepare dishes

understand where food comes from.

Design and Technology Curriculum Long Term Overview

Progression of Skills & knowledge

Textiles

Year 2	
Skills Design • Designing a pouch. Make • Selecting and cutting fabrics for sewing. • Decorating a pouch using fabric glue or running stitch. • Threading a needle. • Sewing running stitch, with evenly spaced, neat, even stitches to join fabric. • Neatly pinning and cutting fabric using a template. Evaluate • Troubleshooting scenarios posed by teacher. • Evaluating the quality of the stitching on others' work. • Discussing as a class, the success of their stitching against the success criteria. • Identifying aspects of their peers' work that they particularly like and why.	Knowledge • To know that sewing is a method of joining fabric • To know that different stitches can be used when sewing. • To understand the importance of tying a knot after sewing the final stitch. • To know that a thimble can be used to protect my fingers when sewing.
Year 3	

Design and Technology Curriculum Long Term Overview

Skills	Knowledge
Design • Designing and making a template from an existing cushion and applying individual design criteria. Make • Following design criteria to create a cushion or Egyptian collar. • Selecting and cutting fabrics with ease using fabric scissors. • Threading needles with greater independence. • Tying knots with greater independence. • Sewing cross stitch to join fabric. • Decorating fabric using appliqué. • Completing design ideas with stuffing and sewing the edges (Cushions) or embellishing the collars based on design ideas (Egyptian collars). Evaluate • Evaluating an end product and thinking of other ways in which to create similar items.	• To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces. • To know that when two edges of fabric have been joined together it is called a seam. • To know that it is important to leave space on the fabric for the seam. • To understand that some products are turned inside out after sewing so the stitching is hidden.

National curriculum - end of KS2

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

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

investigate and analyse a range of existing products

Design and Technology Curriculum Long Term Overview

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

apply their understanding of how to strengthen, stiffen and reinforce more complex structures

understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)

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.

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.

Design and Technology Curriculum Long Term Overview

Progression of Skills & knowledge

Textiles

Year 4	
Skills Design • Writing design criteria for a product, articulating decisions made. • Designing a personalised book sleeve. Make • Making and testing a paper template with accuracy and in keeping with the design criteria • Measuring, marking and cutting fabric using a paper template. • Selecting a stitch style to join fabric. • Working neatly by sewing small, straight stitches. • Incorporating a fastening to a design. Evaluate • Testing and evaluating an end product against the original design criteria. • Deciding how many of the criteria should be met for the product to be considered successful. • Suggesting modifications for improvement. • Articulating the advantages and disadvantages of different fastening types.	Knowledge • To know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and velcro. • To know that different fastening types are useful for different purposes. • To know that creating a mock up (prototype) of their design is useful for checking ideas and proportions.

Design and Technology Curriculum Long Term Overview

Year 5

Skills Design

- Designing a stuffed toy, considering the main component shapes required and creating an appropriate template.
- Considering the proportions of individual components.

Make

- Creating a 3D stuffed toy from a 2D design.
- Measuring, marking and cutting fabric accurately and independently.
- Creating strong and secure blanket stitches when joining fabric.
- Threading needles independently.
- Using appliqué to attach pieces of fabric decoration.
- Sewing blanket stitch to join fabric.
- Applying blanket stitch so the spaces between the stitches are even and regular.

Evaluate

- Testing and evaluating an end product and giving point for further improvements.

Knowledge

- To know that blanket stitch is useful to reinforce the edges of a fabric material or join two pieces of fabric.
- To understand that it is easier to finish simpler designs to a high standard.
- To know that soft toys are often made by creating appendages separately and then attaching them to the main body.
- To know that small, neat stitches which are pulled taut are important to ensure that the soft toy is strong and holds the stuffing securely

National curriculum - end of KS2

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

select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately

Design and Technology Curriculum Long Term Overview

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

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

apply their understanding of how to strengthen, stiffen and reinforce more complex structures

understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)

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.

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.

Design and Technology Curriculum Long Term Overview

Progression of Skills & knowledge

Textiles

Year 6	
Skills Design • Beginning to use more complex annotated sketches, such as cross-sectional and exploded diagrams and pattern pieces in design. • Designing a waistcoat in accordance with a specification linked to set of design criteria. • Annotating designs, to explain their decisions. Make • Using a ruler to accurately measure and draw lines and marks. • Using nets to create 3D objects. • Using a combination of joining techniques to ensure strong joins (for example, using safety pins to hold fabric in place while a running stitch is sewn). • Using a template when cutting fabric to ensure they achieve the correct shape. • Using pins effectively to secure a template to fabric without creases or bulges. • Marking and cutting fabric accurately, in accordance with their design.	Knowledge Technical • Using pins effectively to secure a template to fabric without creases or bulges. • Tying knots at the end of thread to secure it. • Attaching objects like buttons using thread. Additional • To know how designers use pattern pieces when creating textile products. • To know how nets can be folded to create 3D shapes. • To know safety pins can golf fabric in place before sewing. • To know consistently sized stitches improve the aesthetic of a product. • To know the shape of a product can affect both its aesthetics and function. • To know aesthetics is how something looks. • To know complete products are sometimes made in parts that are sewn together. • To understand that it is important to design clothing with the client/ target customer in mind.

Design and Technology Curriculum Long Term Overview

• Sewing a strong running stitch, making small, neat stitches and following the edge. • Tying strong knots. • Decorating a waistcoat, attaching features (such as appliqué) using thread. • Finishing the waistcoat with a secure fastening (such as buttons). • Learning different decorative stitches. • Sewing accurately with evenly spaced, neat stitches. Evaluate • Reflecting on the usability, aesthetics, innovation and sustainability of products and discussing how design choices impact these aspects. • Reflecting on their work continually throughout the design, make and evaluate process.	• o know that using a template (or clothing pattern) helps to accurately mark out a design on fabric. • To understand the importance of consistently sized stitches.

National curriculum - end of KS2

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

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

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

Design and Technology Curriculum Long Term Overview

apply their understanding of how to strengthen, stiffen and reinforce more complex structures

understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)

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.

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.

Design and Technology Curriculum Long Term Overview

Progression of Skills & knowledge

Digital world

Year 3	
Skills Design • Problem solving by suggesting which features on a Micro:bit might be useful and justifying my ideas. • Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge. • Developing design ideas through annotated sketches to create a product concept. • Developing design criteria to respond to a design brief. Make • Following a list of design requirements. • Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm. Evaluate • Analysing and evaluating wearable technology. • Using feedback from peers to improve design.	Knowledge Technical • To understand that, in programming, a 'loop' is code that repeats something again and again until stopped. • To know that a Micro:bit is a pocket-sized, codeable computer. • To know that a simulator is able to replicate the functions of an existing piece of technology. Additional • To know what the 'digital revolution' is and the features of some of the products that evolved as a result. • To understand what is meant by 'point of sale display.' • To know that CAD stands for 'Computer-aided design'. • To know what a focus group is by taking part in one.
Year 4	
Skills Design	Knowledge Technical

Design and Technology Curriculum Long Term Overview

- Writing design criteria for a programmed timer (Micro:bit).
- Exploring different mindfulness strategies.
- Applying the results of my research to further inform my design criteria.
- Developing a prototype case for my mindful moment timer.
- Using and manipulating shapes and clipart by using computer-aided design (CAD), to produce a logo.
- Following a list of design requirements.

Make

- Developing a prototype case for my mindful moment timer.
- Creating 3D structures using modelling materials.
- Programming a micro:bit in the Microsoft micro:bit editor, to time a set number of seconds/minutes upon button press.

Evaluate

- Investigating and analysing a range of timers by identifying and comparing their advantages and disadvantages.
- Evaluating my Micro:bit program against points on my design criteria and amending them to include any changes I made.
- Documenting and evaluating my project.
- Understanding what a logo is and why they are important in the world of design and business.
- Testing my program for bugs (errors in the code).
- Finding and fixing the bugs (debug) in my code.
- Using an exhibition to gather feedback.
- Gathering feedback from the user to make suggested improvements to a product.

- To understand what variables are in programming.
- To know some of the features of a Micro:bit.
- To know that an algorithm is a set of instructions to be followed by the computer.
- To know that it is important to check my code for errors (bugs).
- To know that a simulator can be used as a way of checking your code works before installing it onto an electronic device.

Additional

- To understand the terms 'ergonomic' and 'aesthetic'.
- To know that a prototype is a 3D model made out of cheap materials, that allows us to test design ideas and make better decisions about size, shape and materials.
- To know that an exhibition is a way for companies to showcase products, meet potential new customers and gather feedback from users.

National curriculum - end of KS2

Design and Technology Curriculum Long Term Overview

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

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

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

apply their understanding of how to strengthen, stiffen and reinforce more complex structures

understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)

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.

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.

Progression of Skills & knowledge

Digital world

Year 5	
Skills Design • Researching (books, internet) for a particular (user's) animal's needs. • Developing design criteria based on research. • Generating multiple housing ideas using building bricks. • Understanding what a virtual model is and the pros and cons of traditional and CAD modelling. • Placing and manoeuvring 3D objects, using CAD. • Changing the properties of, or combining one or more 3D objects, using CAD. Make • Understanding the functional and aesthetic properties of plastics. • Programming to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range. Evaluate • Stating an event or fact from the last 100 years of plastic history. • Explaining how plastic is affecting planet Earth and suggesting ways to make more sustainable choices. • Explaining key functions in my program (audible alert, visuals).	Knowledge Technical • To know that a 'device' means equipment created for a certain purpose or job and that monitoring devices observe and record. • To know that a sensor is a tool or device that is designed to monitor, detect and respond to changes for a purpose. • To understand that conditional statements (and, or, if booleans) in programming are a set of rules which are followed if certain conditions are met. Additional • To understand key developments in thermometer history. • To know some key events and facts from the history of plastic and how these affects the future outlook. • To know the 6Rs of sustainability. • To understand what a virtual model is and the pros and cons of traditional vs CAD modelling.

Design and Technology Curriculum Long Term Overview

• Explaining how my product would be useful for an animal carer including programmed features.	
Year 6	
Skills Design • Writing a design brief from information submitted by a client. • Developing design criteria to fulfil the client's request. • Considering and suggesting additional functions for my navigation tool. • Developing a product idea through annotated sketches. • Placing and manoeuvring 3D objects, using CAD. • Changing the properties of, or combining one or more 3D objects, using CAD. Make • Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo). • Explaining material choices and why they were chosen as part of a product concept. • Programming an N,E, S, W cardinal compass. Evaluate • Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool. • Developing an awareness of sustainable design. • Identifying key industries that utilise 3D CAD modelling and explaining why.	Knowledge Technical • To know that accelerometers can detect movement. • To understand that sensors can be useful in products as they mean the product can function without human input. Additional • To know that designers write design briefs and develop design criteria to enable them to fulfil a client's request. • To know that 'multifunctional' means an object or product has more than one function. • To know that magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing.

Design and Technology Curriculum Long Term Overview

• Describing how the product concept fits the client's request and how it will benefit the customers. • Explaining the key functions in my program, including any additions. • Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool. • Explaining the key functions and features of my navigation tool to the client as part of a product concept pitch. • Demonstrating a functional program as part of a product concept pitch.	

National curriculum - end of KS2

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

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

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

apply their understanding of how to strengthen, stiffen and reinforce more complex structures

understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)

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.

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.