

Bream C of E Primary School

Helping all children to become caring, confident and curious young people

**‘Be the best you can be; together we grow from acorns to oaks
flourishing in God’s love’**

Design & Technology Curriculum Skills Progression Document

Table of Contents

Intent, Implementation and Impact	3
How does Kapow Primary's scheme of work align with the National Curriculum?	4
Art and DT Timetable (2023-24).....	11
Progression of Knowledge - Learning Objectives.....	12
Progression of Knowledge	17
Whole School Resources and Equipment Lists	45
Appendix 1 - EYFS Core Learning.....	50
Appendix 2 - Year 1 Core Learning	51
Appendix 3 - Year 2 Core Learning.....	52
Appendix 4 - Year 3 Core Learning.....	54
Appendix 5 - Year 4 Core Learning.....	56
Appendix 6 - Year 5 Core Learning.....	57
Appendix 7 - Year 6 Core Learning.....	59

Intent, Implementation and Impact

Intent

At Bream C of E Primary School, the Design and Technology curriculum intends to develop children's academic and practical skills by encouraging them to solve problems based on initial exploration of designers and their products, leading to solving problems based on real life contexts. Design and Technology gives all children the opportunity to reflect on what they have learned through their practical exploration and then to use this knowledge to design and make their own product. It aims to encourage children to take risks, to develop new innovative designs and to be reflective learners by giving them opportunities to evaluate their own work, as well as the design and work of others within school and the wider world. Children are given time to test their own products and make necessary adjustments, thus enabling them to change their designs and improve their end product. By looking at the work of others and giving praise to celebrate success, and words of advice when products need further work, we enable children to become evaluative learners.

Implementation

The Design and Technology curriculum at Bream C of E Primary School is designed by identifying the key skills, knowledge and understanding required by the National Curriculum. It is then planned to ensure that the skills are taught sequentially across the EYFS, KS1 and KS2 and that new skills build on and develop the skills taught in previous year groups. All children have the opportunity to engage in the 'design, make and evaluate' process. They are given the opportunity to engage in a wide range of Design and Technology activities which actively encourages them to embrace the subject and develop a lifelong set of skills. Design and Technology is a practical subject in which children play with and explore a wide range products and designs. They use knowledge from this exploration to create their own designs and they then use a wide range of materials and tools to build their own products. The Design and Technology Curriculum is designed to be relevant, motivating and engaging for the children and inclusive of all groups of children and individuals across the school. Opportunities for evaluation enable the children to look deeper into their learning and reflect on what they have designed and made, and assess whether it has successfully met their own design criteria. Teachers assess pupil progress through a range of formative assessments which includes: pupil conferences, book scrutinies and pupil practical tasks. Assessments are recorded on the school assessment tracker 'Insight'. Assessment then informs planning, identifying any gaps in knowledge or skills, ensuring that our children have every opportunity to develop as inquisitive designers and technologists.

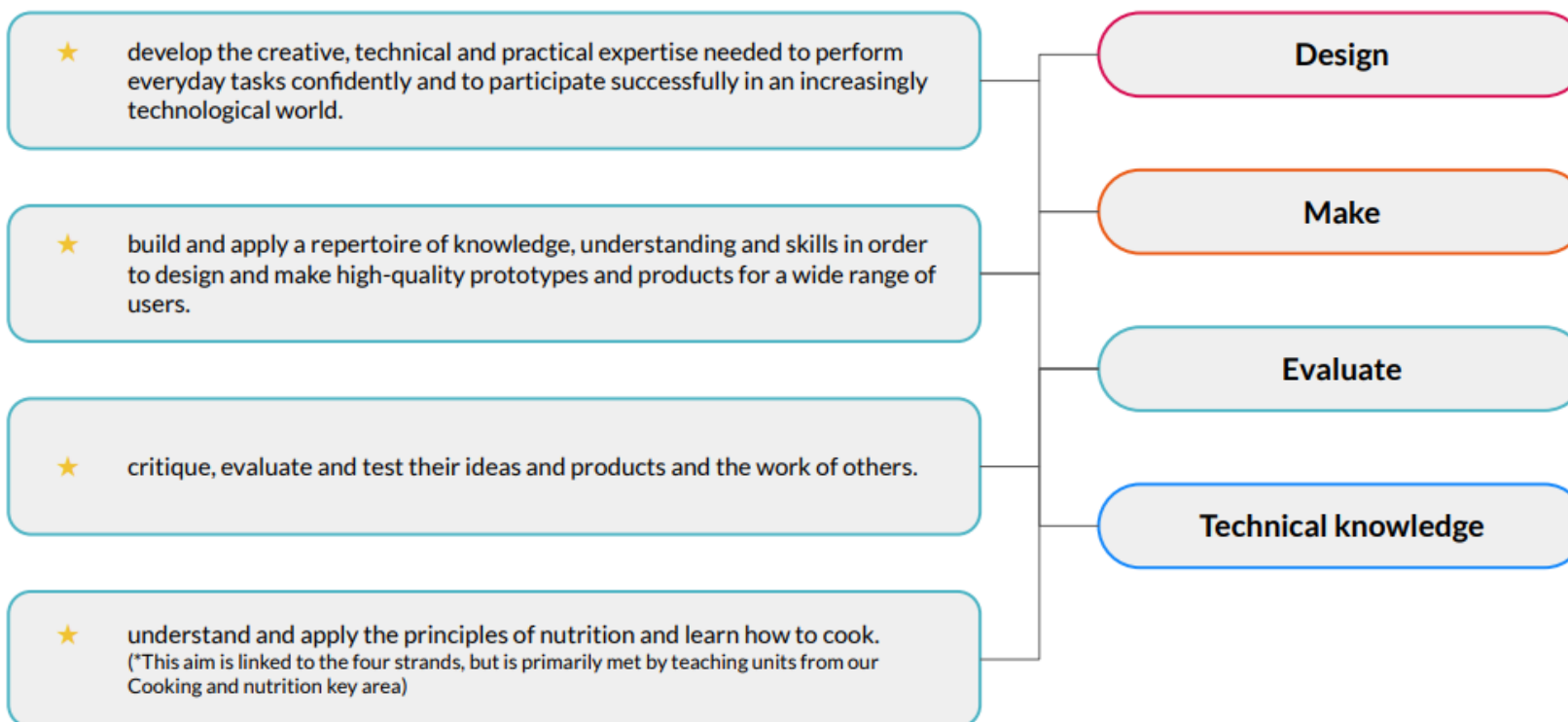
Impact

Our Design and Technology curriculum enables and encourages our children to become critical thinkers. They look at existing designs to analyse and assess their effectiveness and then they consider ways of redesigning and reconstructing these designs to improve their overall success. Through Design and technology our children learn to take risks. Children learn to be passionate and excited by the designing and making of products, including working with, preparing and tasting food. They become resourceful, innovative, enterprising and capable citizens. They develop a critical understanding of how design and technology impacts on daily life and the wider world and they also understand how design and technology makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

How does Kapow Primary's scheme of work align with the National Curriculum?

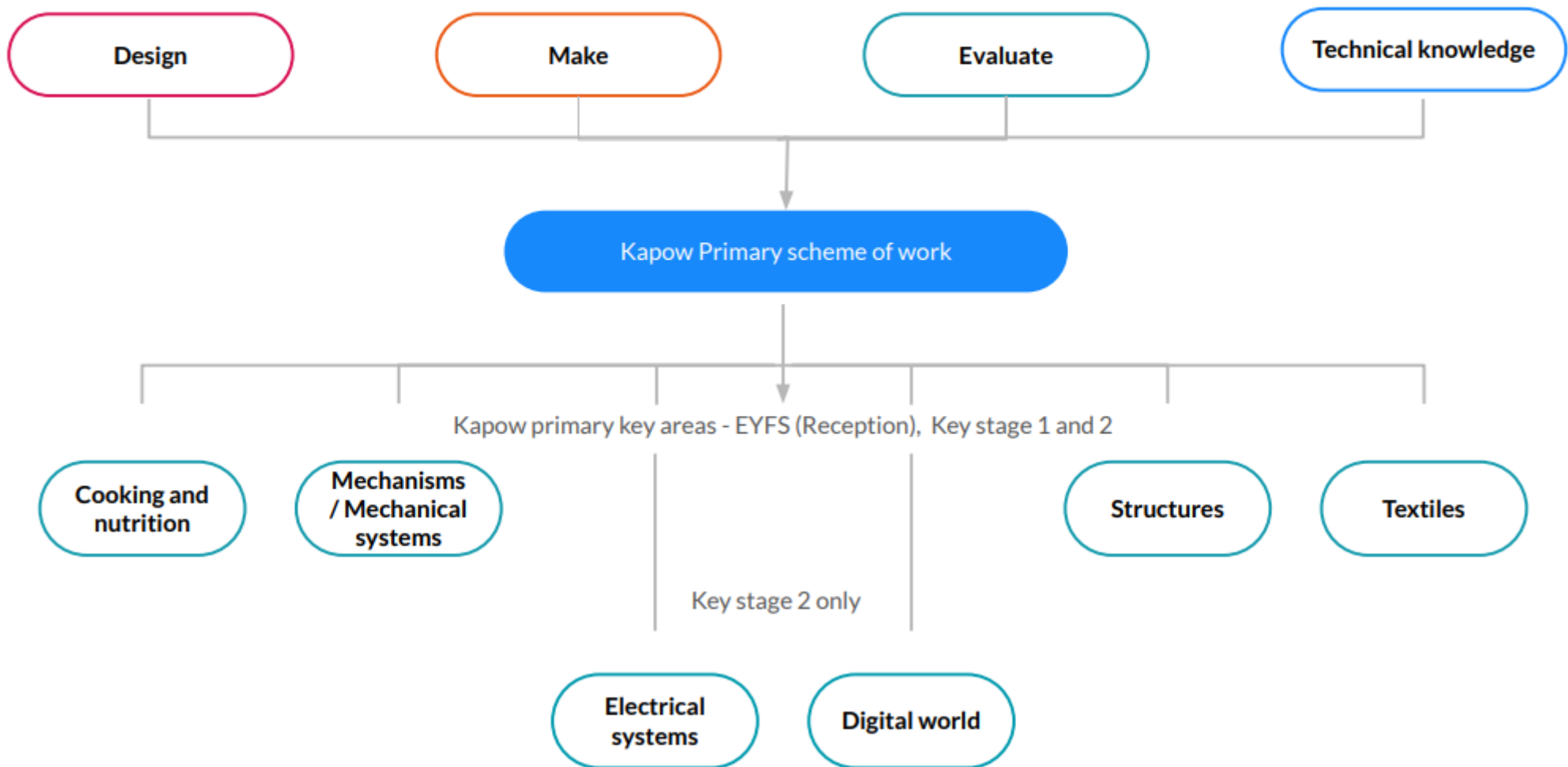
Our scheme of work fulfils the statutory requirements outlined in the **national curriculum (2014)**. The national curriculum Programme of study for Design and technology aims to ensure that all pupils:

We have identified four key strands which run throughout our scheme of work:



Our [D&T: National curriculum overview](#) document shows which of our units cover each of the National curriculum attainment targets and strands above. Each lesson plan references the relevant National curriculum objectives, along with cross-curricular links to any other subjects. For EYFS (Reception) links are made to Development matters and the Early Learning Goals.

How is the Design and technology scheme of work organised?



Trust, Friendship, Respect, Forgiveness, Courage, Truthfulness

Key areas

The six key areas are revisited each year, with Electrical systems and Digital world beginning in KS2. The areas enable all subject leads, specialists or non-specialists, to understand and make it easy for teachers to see prior and future learning for your pupils. You can see, at a glance, how the unit you are teaching fits into their wider learning journey.

EYFS (Reception) Key Stage 1 and 2

Cooking and nutrition

Where food comes from, balanced diet, preparation and cooking skills. Kitchen hygiene and safety. Following recipes.

Mechanisms/ Mechanical systems

Mimic natural movements using mechanisms such as cams, followers, levers and sliders.

Structures

Material functional and aesthetic properties, strength and stability, stiffen and reinforce structures.

Textiles

Fastening, sewing, decorative and functional fabric techniques including cross stitch, blanket stitch and appliqué.

Electrical systems

Operational series circuits, circuit components, circuit diagrams and symbols, combined to create various electrical products.

Digital world

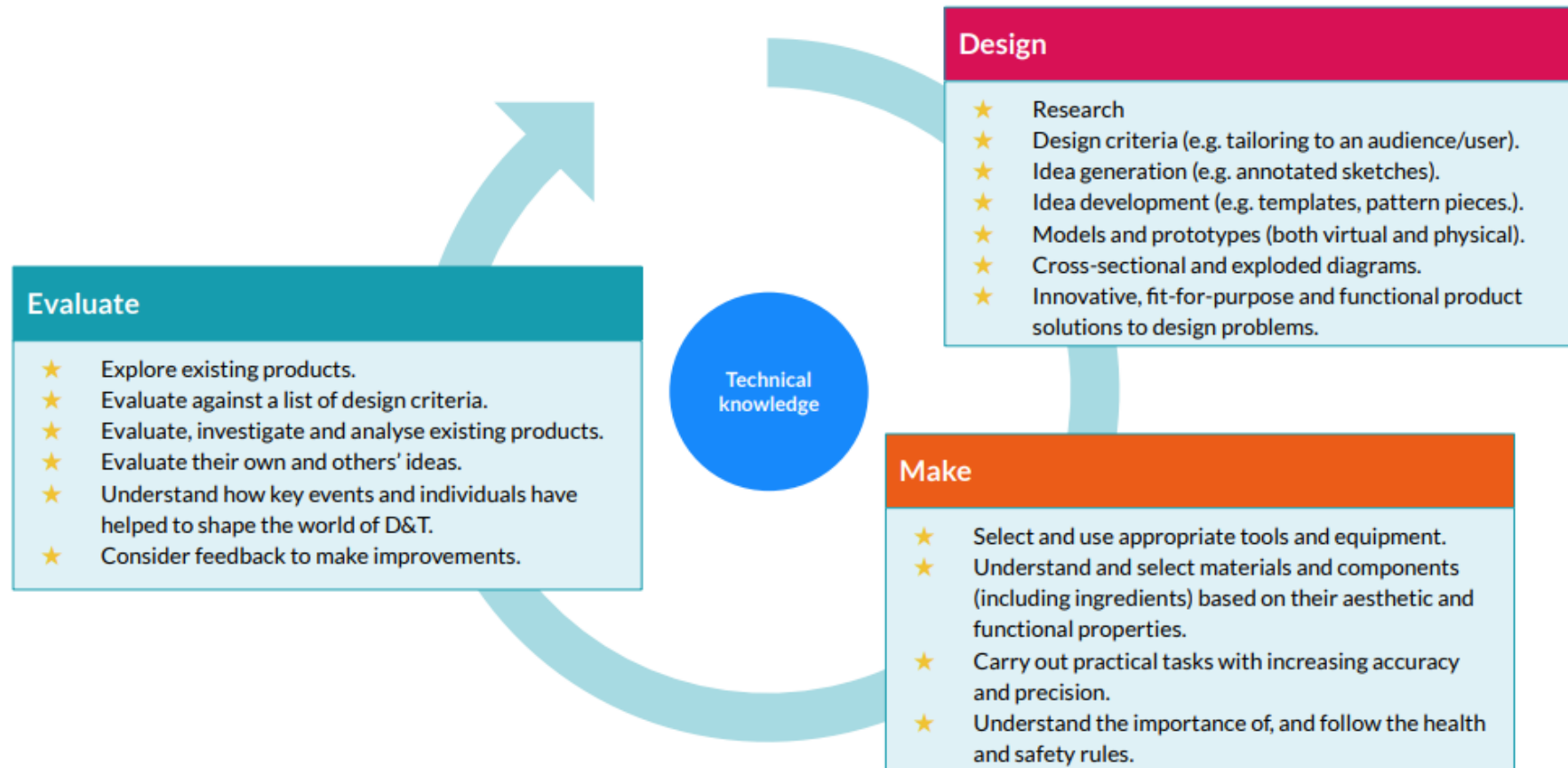
Program products to monitor and control, develop designs and virtual models using 2D and 3D CAD software.

Key Stage 2

Trust, Friendship, Respect, Forgiveness, Courage, Truthfulness

The design process

The Design and technology National Curriculum outlines the three main stages of the design process: design, make and evaluate. Each Kapow Primary unit follows these stages, to form a full project. Each stage of the design process is underpinned by technical knowledge which encompasses the contextual, historical and technical understanding, required for each strand.



Cooking and nutrition* has a separate section in the D&T National Curriculum, with additional focus on specific principles, skills and techniques in food, including where food comes from, diet and seasonality. Cooking and nutrition units still follow the design process summarised above, for example by tasking the pupils to develop recipes for a specific set of requirements (design criteria) and to suggest methods of packaging the food product including the nutritional information.

How does Kapow Primary help our school to meet statutory guidance for D&T?

Each of our key areas links to the technical knowledge section of the Design and technology National Curriculum **or** reinforces principles learnt through exploring various methods and techniques. From KS1 to KS2, the technical knowledge descriptors build upon prior learning and/or introduce new learning.

	Structures	Mechanisms	Textiles	Electrical systems	Digital world	Cooking and nutrition
EYFS	Explore junk modelling, tinkering with temporary and permanent joins, and a range of materials. Create basic models to test in different conditions.	Explore a simple paper slider mechanism.	Explore and develop threading and weaving skills with different materials and objects.			Explore and become familiar with different fruits and vegetables, using their senses.
KS1	Build structures such as windmills and chairs, exploring how they can be made stronger, stiffer and more stable. Recognise areas of weakness through trial and error.	Introduce and explore simple mechanisms, such as sliders, wheels and axles in their designs. Recognise where mechanisms such as these exist in toys and other familiar products.	Explore different methods of joining fabrics and experiment to determine the pros and cons of each technique.	KS2 only* Create functional electrical products that use series circuits, incorporating different components such as bulbs, LEDs, switches, buzzers and motors. Consider how the materials used in these products can:	KS2 only* Learn how to develop an electronic product with processing capabilities. Apply Computing principles to program functions within a product including to control and monitor it. Understand how the history and evolution of product design lead to the on-going Digital revolution and the impact it is having in the world today.	Learn about the basic rules of a healthy and varied diet to create dishes. Understand where food comes from, for example plants and animals.
KS2	Continue to develop KS1 exploration skills, through more complex builds such as pavilion and bridge designs. Understand material selection and learn methods to reinforce structures.	Mechanical systems Extend pupils understanding of individual mechanisms, to form part of a functional system, for example: Automatas, that use a combination of cams, followers, axles/shaft, cranks and toppers.	Understand that fabric can be layered for effect, recognising the appearance and technique for different stitch and fastening types, including their: • Strength. • Appropriate use. • Design.	• Protect the circuitry. • Reflect light. • Conduct electricity. • Insulate.		Understand and apply the principles of a healthy and varied diet to prepare and cook a variety of dishes using a range of cooking techniques and methods. Understand what is meant by seasonal foods. Know where and how ingredients are sourced.

Design and technology in EYFS (reception)

Child-led learning is integral to the Early Years curriculum, and rightly so. Supporting children in following and exploring their own interests allows for a greater depth of learning and understanding and much higher levels of wellbeing and engagement.

Adults in the classroom can model how to use Design and technology to aid children in their pursuits and scaffold the learning so that they can reach a deeper level of understanding.

We know that the difficulty with child-led Design and technology projects often arises when the pupils are not equipped to properly plan their creation or execute their ideas in the way that they wish, sometimes meaning that they will spend a very short amount of time at the workshop or junk modelling area before moving on.

Planning, designing, making and developing skills and knowledge are all fundamental parts of our Design and technology scheme. As you work through our EYFS reception units, children will have plenty of opportunities to get to know each of these areas, as they explore different materials, processes and outcomes.

When pupils are accessing these areas outside of lesson times, it is your job to support and scaffold their learning, offering suggestions or listening to their ideas. Rather than creating artificial learning opportunities during these times of child-led play, instead wait until you observe that a child or group of children have shown a particular interest in a topic. Offer to help them enhance their chosen area of exploration by providing additional resources, demonstrating how to use existing resources or even using the computer.

To learn more please see our [Design and Technology EYFSP](#)



A spiral curriculum

The scheme of work has been designed as a spiral curriculum with the following key principles in mind:

- ✓ **Cyclical:** Pupils return to the key areas again and again during their time in primary school.
- ✓ **Increasing depth:** Each time a key area is revisited it is covered with greater complexity.
- ✓ **Prior knowledge:** Upon returning to each key area, prior knowledge is utilised so pupils can build upon previous foundations, rather than starting again.



Is there any flexibility in the Kapow Primary Design and technology scheme?

Our Design and technology scheme of work is organised into units of four lessons (or six in EYFS: Reception).

Within each unit, lessons must be taught in order as they build upon each other.

Across a single year group, units themselves do not need to be taught in the suggested order.

The flexibility in the order allows schools to adapt the planning to suit their school and to make use of cross-curricular links available.

The suggested order in these long term plans takes account of the limited resources which may be available in school. Therefore the key strands have been distributed across the year so that all year groups are not requiring the same tools and equipment at the same time.

Art and DT Timetable (2023-24)

	First 2 weeks	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Reception	Self Portrait	Art	DT	Art	DT	Art	DT
Year 1	Self Portrait	Art	DT	Art	DT	DT	Art
Year 2	Self Portrait	DT	Art	DT	Art	Art	DT
Year 3	Self Portrait	DT	Art	DT	Art	DT	Art
Year 4	Self Portrait	Art	DT	Art	DT	Art	DT
Year 5	Self Portrait	Art	DT	Art	DT	Art	DT
Year 6	Self Portrait	Art	DT	DT	Art	Art	DT

Progression of Knowledge – Learning Objectives

	Structure		Cooking and nutrition	Textiles	Mechanical Systems / Mechanisms		Electrical systems (KS2)	Digital World (KS2)
Reception EYFS	- To explore and investigate the tools and materials in the junk modelling area. - To develop scissor skills. - To investigate cutting different materials. - To learn how to plan and select the correct resources needed to make a model. - To verbally plan and create a junk model. - To share a finished model and talk about the processes in its creation. - To explore different ways to temporarily join materials together.	- To understand what waterproof means and to test whether materials are waterproof. - To test and make predictions for which materials float or sink. - To compare the uses of boats. - To investigate how the shape and structure of boats affects the way they move. - To design a boat. - To create a boat based upon their own design.	- To explore fruits and vegetables and the differences between them. - To use adjectives to describe how fruits and vegetables look, feel, smell and taste. - To listen to and recall elements from the story 'The Best Pumpkin Soup'. - To explore a pumpkin and describe it using the five senses. - To design a fruit and vegetable soup recipe. - To practise cutting with a knife. - To learn how to use a knife safely. - To observe and help (where appropriate) with the use of tools to prepare ingredients. - To describe the finished product and evaluate the process. - To design food packaging.	- To develop threading and weaving skills. - To practise and apply weaving skills to a specific material e.g. paper. - To practise and apply threading skills with specific materials e.g. hessian and wool. - To use threading or sewing to design a product (bookmark). - To create a textiles product (bookmark) following their own design. - To reflect with children on how they have achieved their aims.				
Year 1	- To include individual preferences and requirements in my design. - To make a stable structure. - To assemble the components of my structure.		- To identify fruits. - To describe where fruits and vegetables grow. - To practise food	- To join fabrics together using different methods. - To use a template	- To explore making mechanisms. - To design a moving storybook. - To construct a	- To understand how wheels move. - To identify what stops wheels from turning.		

	Structure	Cooking and nutrition	Textiles	Mechanical Systems / Mechanisms		Electrical systems (KS2)	Digital World (KS2)
	• To evaluate my project and adapt my design.	- preparation skills. • To select ingredients for a recipe. • To apply food preparation skills to a recipe. • To evaluate against the design brief.	- to create my design. • To join two fabrics together accurately. • To embellish my design using joining methods.	- moving picture. • To evaluate my finished product.	• To design a moving vehicle. • To build a moving vehicle.		
Year 2	• To explore the concept and features of structures and the stability of different shapes. • To understand that the shape of the structure affects its strength. • To make a structure according to design criteria. • To produce a finished structure and evaluate its strength, stiffness and stability.	• To explore wheel mechanisms and design a Ferris wheel. • To select appropriate materials. • To build and test a moving wheel. • To make and evaluate a structure with a rotating wheel.	• To look at objects and understand how they move. • To look at objects and understand how they move. • To explore different design options. • To make a moving monster.	• To recognise foods and their food groups. • To identify the balance of food groups in a meal. • To identify an appropriate piece of equipment to prepare a given food • To select balanced combinations of ingredients. • To design based on criteria. • To evaluate a dish based on design criteria.	• To sew a running stitch. • To sew a running stitch. • To join fabrics using a running stitch. • To decorate a pouch using fabric glue or stitching.		
Year 3	• To recognise how multiple shapes (2D and 3D) are combined to form a strong and stable structure. • To design a castle. • To construct 3D nets. • To construct and evaluate my final product.	• To explain why food comes from different places around the world. • To explain the benefits of seasonal foods.	<u>Egyptian Collars</u> • To learn how to sew cross-stitch and to appliqué. • To develop and use a template. • To assemble	• To understand how pneumatic systems work. • To design a toy that uses a pneumatic system. • To create a pneumatic system. • To test and finalise ideas against design criteria.		• To understand the purpose of information design. • To research a set topic to develop a range	• To research a set topic to develop a range of initial ideas. • To write a program to initiate a

	Structure	Cooking and nutrition	Textiles	Mechanical Systems / Mechanisms	Electrical systems (KS2)	Digital World (KS2)
		- To develop cutting and peeling skills. - To evaluate seasonal ingredients. - To design a mock-up using criteria. - To evaluate a dish.	fabric parts into a fabric product. - To decorate fabric using appliqué and cross-stitch. <u>Cushions</u> - To learn how to sew cross-stitch and to appliqué. - To design a product and its template. - To decorate fabric using appliqué and cross-stitch. - To assemble and complete a cushion.		of initial ideas. - To research a set topic to develop a range of initial ideas. - To research a set topic to develop a range of initial ideas.	flashing LED panel after button press and/or automatically initiate using the Micro:bit light sensing, as part of an eCharm - To create and decorate a foam pouch for the eCharm, using a template - To design a display badge and/or stand using CAD (computer-aided design) software for an eCharm product
Year 4	- To create a range of different shaped frame structures. - To design a structure. - To build a frame structure. - To add cladding to a frame structure.	- To evaluate existing biscuit products. - To prepare and cook a dish. - To select ingredients and follow a budget. - To take inspiration from existing products.	- To explain the advantages and disadvantages of different types of fastening type. - To design a product to meet design criteria. - To make and test	- To build a car chassis. - To design a shape that reduces air resistance. - To make a model based on a chosen design. - To assemble and test my completed product.	- To learn about electrical items and how they work. - To analyse and evaluate electrical products. - To design a	- To evaluate existing products. - To develop design criteria. - To program and control a product. - To develop and

	Structure	Cooking and nutrition	Textiles	Mechanical Systems / Mechanisms	Electrical systems (KS2)	Digital World (KS2)
		- To make and test a prototype biscuit. - To evaluate a final product.	- a paper template. - To assemble a book jacket.		- product to fit a set of specific user needs. - To make and evaluate a torch.	- communicate ideas. - To develop ideas through computer-aided design. - To consider feedback and evaluate.
Year 5	- To explore how to reinforce a beam (structure) to improve its strength. - To build a spaghetti truss bridge. - To build a wooden truss bridge. - To complete, reinforce and evaluate my truss bridge.	- To understand how ingredients are reared and processed. - To make adaptations to design a recipe. - To evaluate nutritional content. - To practice food preparation skills. (The main course) - To design a product label. - To follow and make an adapted recipe.	- To design a stuffed toy. - To sew a blanket stitch. - To create and add decorations to fabric. - To use a blanket stitch to assemble the components of a stuffed toy.	- To design a pop-up book. - To follow my design brief to make my pop-up book. - To use layers and spacers to cover the working of mechanisms. - To create a high-quality product suitable for a target user.	- To understand how motors are used in electrical products. - To investigate an existing product to determine the factors that affect the product's form and function. - To apply the findings from research to develop a unique product. - To develop a DIY kit for another individual to assemble their product.	- To carry out research to develop design criteria. - To write a program to monitor the ambient temperature, including an alert. - To generate creative and unique micro:bit case, stand or housing ideas. - To learn about and practise 3D CAD skills.
Year 6	- To design a playground with a variety of structures. - To build a range of structures. - To improve and add detail to	- To explain the use of complementary flavours. - To research and	- To design a waistcoat. - To mark and cut fabric according	- To prepare wood for assembly by measuring, marking and cutting each piece. - To assemble the automata frame	To research and analyse a range of children's toys.	To write a design brief and criteria based on a

	Structure	Cooking and nutrition	Textiles	Mechanical Systems / Mechanisms	Electrical systems (KS2)	Digital World (KS2)
	structures. • To create a surrounding landscape.	design a three-course meal. • To explain recipe choices. • (To start...) To apply culinary skills and knowledge. • (The main course) To apply culinary skills and knowledge. • (Dessert) To apply culinary skills and knowledge.	to a design. • To assemble a waistcoat. • To decorate your waistcoat.	components and supports with the help of an exploded diagram. • To explore the relationship between cam profiles and follower movement to inform a design decision. • To apply the housing and finishing touches to the automata frame.	• To design a steady hand game. • To construct a stable base. • To assemble electronics and complete their electronic game.	client request. • To write a program to include multiple functions as part of a navigation device. • To develop a sustainable product concept. • To develop 3D CAD skills to produce a virtual model. • To present a pitch to 'sell' the product to a specified client

Progression of Knowledge

Structures				Cooking and nutrition	Textiles	
		Junk Modelling	Boats	Soup	Bookmarks	
Reception (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.	• Designing a soup recipe as a class. • Designing soup packaging.	• Discussing what a good design needs. • Designing a simple pattern with paper. • Designing a bookmark. • Choosing from available materials.
		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.	• Chopping plasticine safely. • Chopping vegetables with support.	• 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 practice threading.
		Evaluate	• 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.	• 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.	• Reflecting on a finished product and comparing to their design.

	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.	• 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.	• 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.
		Additional		• To know that some objects float and others sink. • To know the different parts of a boat.		

Lessons	1. Children learn about the names and use of various craft tools and materials for junk modelling and explore ways to manipulate materials to create different effects. 2. Pupils practise and develop their scissor (and fine motor) skills by investigating how easy or difficult it is to cut and shape different materials using a variety of scissor types (right, left-handed, squeeze and craft zigzag and scalloped). 3. After exploring and practising with various materials and tools in the junk modelling area, pupils decide and discuss which resources they would like to use and generate ideas to develop a class-based junk model. 4. Pupils put all of the skills and decisions into practice by developing their own unique junk model plan, which includes which tools, materials and components they will need to make it possible (e.g. a cone shape for a rocket top). They begin to build their junk model. 5. Following their plan, pupils continue to build their junk models, sticking as closely to their decisions as possible. When complete, pupils discuss and evaluate their finished model and present it to the rest of the class.	1. Pupils investigate and learn about waterproof materials. They conduct a test in groups and observe what happens when they pour water through various samples before reporting back to the class what they discovered. 2. Pupils investigate and learn about what floating and sinking means. They make predictions about whether an object will float or sink before they test their ideas as part of an experiment to see what will happen. 3. Reflecting on their experiences with boats and learning about how boats and ships are used. 4. The children continue to look at boats and ships, but with a particular focus on their shape and how they move through the water. They explore and play with various boats and containers to determine which shapes work best. 5. Applying what they have learnt through lessons one to four, the children discuss what would make a successful boat. They sketch, and discuss with their peers, their design ideas for their own boats. 6. Pupils build the boat models they designed in lesson five.	1. Children explore and become familiar with different types of fruits and vegetables and their differences in texture, taste and appearance. 2. After listening to 'The best pumpkin soup' story, pupils re-enact each part of the story using props. They explore the interior and exterior of a pumpkin. Using their senses, they describe the pumpkin's appearance and texture. 3. Using what they have learnt from lessons one and two, children develop a vegetable soup recipe of their own. When finished, the children share their ideas with their peers to create a class soup recipe. 4. The children work in groups to practise their fine motor skills to slice and chop play dough, ready to help prepare their vegetables next lesson. 5. After developing a class soup recipe in lesson three and practising their fine motor skills in lesson four, pupils prepare different fruits and vegetables in groups ready to make, taste and evaluate the soup. 6. The children become packaging designers in this	1. Children develop their threading and weaving skills by exploring different materials and objects, such as ribbons through wire racks or wool through ten-frames. 2. Building on lesson one, the children continue to explore weaving techniques, using a weaving base and paper strips. 3. The children apply what they learnt in lesson one to develop their threading skills using wool through hessian fabric, and then with a sewing needle and thread. 4. Children learn about the history of the bookmark back in Victorian times and compare them to modern-day styles before developing design ideas for their own. 5. After developing their own design in lesson four, children begin to plan and sew their bookmark design using hessian fabric and thread. 6. Continuing from lesson five, children complete their bookmarks and then in pairs, reflect and evaluate each other's bookmarks - paper versus fabric designs.
-----------------------	---	---	--	--

	6. Building on their knowledge of joins such as glue, paper clips and sticky tape, pupils explore and tinker with a range of temporary joining methods and their use (e.g. hook and loop shoes).	They test and evaluate their boats on the water, with increasing cargo and reflect on what could have been improved about the design.	lesson and look at existing soup packaging before generating their own ideas and designs for the class soup.	
Learning Objectives	1. To explore and investigate the tools and materials in the junk modelling area. 2. To develop scissor skills. To investigate cutting different materials. 3. To learn how to plan and select the correct resources needed to make a model. 4. To verbally plan and create a junk model. 5. To share a finished model and talk about the processes in its creation. 6. To explore different ways to temporarily join materials together.	1. To understand what waterproof means and to test whether materials are waterproof. 2. To test and make predictions for which materials float or sink. 3. To compare the uses of boats. 4. To investigate how the shape and structure of boats affects the way they move. 5. To design a boat. 6. To create a boat based upon their own design.	1. To explore fruits and vegetables and the differences between them. To use adjectives to describe how fruits and vegetables look, feel, smell and taste. 2. To listen to and recall elements from the story 'The Best Pumpkin Soup'. To explore a pumpkin and describe it using the five senses. 3. To design a fruit and vegetable soup recipe. 4. To practise cutting with a knife. To learn how to use a knife safely. 5. To observe and help (where appropriate) with the use of tools to prepare ingredients. To describe the finished product and evaluate the process. 6. To design food packaging.	1. To develop threading and weaving skills. 2. To practise and apply weaving skills to a specific material e.g. paper. 3. To practise and apply threading skills with specific materials e.g. hessian and wool. 4. To use threading or sewing to design a product (bookmark). 5. To create a textiles product (bookmark) following their own design. 6. To reflect with children on how they have achieved their aims.

Structures				Mechanisms / Mechanical Systems		Cooking and nutrition	Textiles
Constructing a Windmill				Making a Moving Storybook	Wheels and Axles	Smoothies	Puppets
Year 1	Skills	Design	• Learning the importance of a clear design criteria. • Including individual preferences and requirements in a design.	• Explaining how to adapt mechanisms, using bridges or guides to control the movement. • Designing a moving story book for a given audience.	• 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.	• Designing smoothie carton packaging by-hand or on ICT software.	• Using a template to create a design for a puppet.
		Make	• Making stable structures from card, tape and glue. • Learning how to turn 2D nets into 3D structures. • 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.	• Following a design to create moving models that use levers and sliders.	• Adapting mechanisms, when: • they do not work as they should. • to fit their vehicle design. • to improve how they work after testing their vehicle.	• Chopping fruit and vegetables safely to make a smoothie.	• Cutting fabric neatly with scissors. • Using joining methods to decorate a puppet. • Sequencing steps for construction.
		Evaluate	• 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.	• 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.	• Testing wheel and axle mechanisms, identifying what stops the wheels from turning, and recognising that a wheel needs an axle in order to move.	• 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.	• Reflecting on a finished product, explaining likes and dislikes.

			• To understand that the shape of materials can be changed to improve the strength and stiffness of structures. • To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses). • 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 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.	• 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. • 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.	• To know that a blender is a machine which mixes ingredients together into a smooth liquid. • To know that a fruit has seeds. • To know that fruits grow on trees or vines. • To know that vegetables can grow either above or below ground. • To know that vegetables is any edible part of a plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber).	• 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.
--	--	--	---	---	---	---	--

		Additional	• To know that a client is the person I am designing for. • To know that design criteria is 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 in Design and technology we call a plan a 'design'	• To know some real-life items that use wheels such as wheelbarrows, hamster wheels and vehicles.		
Learning Objectives			• To include individual preferences and requirements in my design. • To make a stable structure. • To assemble the components of my structure. • To evaluate my project and adapt my design.	• To explore making mechanisms. • To design a moving storybook. • To construct a moving picture. • To evaluate my finished product.	• To understand how wheels move. • To identify what stops wheels from turning. • To design a moving vehicle. • To build a moving vehicle.	• To identify fruits. • To describe where fruits and vegetables grow. • To practise food preparation skills. • To select ingredients for a recipe. • To apply food preparation skills to a recipe. • To evaluate against the design brief.	• To join fabrics together using different methods. • To use a template to create my design. • To join two fabrics together accurately. • To embellish my design using joining methods.

Structures				Mechanisms / Mechanical Systems		Cooking and nutrition	Textiles
Baby Bear's Chair				Fairground wheel	Making a moving monster	A balanced diet	Pouches
Year 2	Skills	Design	• Generating and communicating ideas using sketching and modelling. • Learning about different types of structures, found in the natural world and in everyday objects.	• Selecting a suitable linkage system to produce the desired motion. • Designing a wheel.	• Creating a class design criteria for a moving monster. • Designing a moving monster for a specific audience in accordance with a design criteria.	• Designing a healthy wrap based on a food combination which work well together.	• Designing a pouch.
		Make	• Making a structure according to design criteria. • Creating joints and structures from paper/card and tape. • Building a strong and stiff structure by folding paper	• Selecting materials according to their characteristics. • Following a design brief.	• 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	• Slicing food safely using the bridge or claw grip. • Constructing a wrap that meets a design brief.	• 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	• Exploring the features of structures. • Comparing the stability of different shapes. • Testing the strength of own structures. • Identifying the weakest part of a structure. • Evaluating the strength, stiffness and stability of own structure.	• Evaluating different designs. • Testing and adapting a design.	• Evaluating own designs against design criteria. • Using peer feedback to modify a final design.	• Describing the taste, texture and smell of fruit and vegetables. • Taste testing food combinations and final products. • Describing the information that should be included on a label. • Evaluating which grip was most effective.	• 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.

			• 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.	• To know that different materials have different properties and are therefore suitable for different uses.	• 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.	• To know that 'diet' means the food and drink that a person or animal usually eats. • To understand what makes a balanced diet. • To know where to find the nutritional information on packaging. • To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar. • To understand that I should eat a range of different foods from each food group, and roughly how much of each food group. • To know that nutrients are substances in food that all living things need to make energy, grow and develop. • To know that 'ingredients' means the items in a mixture or recipe. • To know that I should only have a maximum of five teaspoons of sugar a day to stay healthy. • To know that many foods and drinks we do not expect to contain sugar do; we call these 'hidden sugars'.	• 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.
--	--	--	---	---	--	---	--

		Additional	• To know that natural structures are those found in nature. • To know that man-made structures are those made by people.	• To know the features of a Ferris wheel, include the wheel, frame, pods, a base and an axle holder. • To know that it is important to test my design as I go along so that I can solve any problems that may occur.	• To know some real-life objects that contain mechanisms.		
Learning Objectives			• To explore the concept and features of structures and the stability of different shapes. • To understand that the shape of the structure affects its strength. • To make a structure according to design criteria. • To produce a finished structure and evaluate its strength, stiffness and stability.	• To explore wheel mechanisms and design a Ferris wheel. • To select appropriate materials. • To build and test a moving wheel. • To make and evaluate a structure with a rotating wheel.	• To look at objects and understand how they move. • To look at objects and understand how they move. • To explore different design options. • To make a moving monster.	• To recognise foods and their food groups. • To identify the balance of food groups in a meal. • To identify an appropriate piece of equipment to prepare a given food • To select balanced combinations of ingredients. • To design based on criteria. • To evaluate a dish based on design criteria.	• To sew a running stitch. • To sew a running stitch. • To join fabrics using a running stitch. • To decorate a pouch using fabric glue or stitching.

Structures				Mechanisms / Mechanical Systems	Cooking and nutrition	Textiles
Constructing a Castle				Pneumatic Toys	Eating seasonally	Cross-stitch and appliqué Cushions or Egyptian collars
Year 3	Skills	Design	• 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	• 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	• Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish.	• Designing and making a template from an existing cushion and applying individual design criteria.
		Make	• Constructing a range of 3D geometric shapes using nets. • Creating special features for individual designs. • Making facades from a range of recycled materials.	• 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.	• Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination. • Following the instructions within a recipe.	• 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 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	• 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.	• Establishing and using design criteria to help test and review dishes. • Describing the benefits of seasonal fruits and vegetables and the impact on the environment. • Suggesting points for improvement when making a seasonal tart.	• Evaluating an end product and thinking of other ways in which to create similar items.
	Knowledge	Technical	• To understand that wide and flat based objects are more stable. • To understand the importance of strength and stiffness in structures.	• 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.	• To know that not all fruits and vegetables can be grown in the UK. • To know that climate affects food growth. • To know that vegetables and fruit grow in certain seasons. • To know that cooking instructions are known as a 'recipe'. • To know that imported food is food which has been brought into the country. • To know that exported food is food which has been sent to another country. • To understand that imported foods travel from far away and this can negatively impact the environment. • To know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre. • To understand that vitamins, minerals and fibre are important for energy, growth and maintaining health. • To know safety rules for using, storing and cleaning a knife safely. • To know that similar coloured fruits and vegetables often have similar nutritional benefits.	• 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.

		Additional	• 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. • To know that a design specification is a list of success criteria for 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.		
Learning Objectives			• To recognise how multiple shapes (2D and 3D) are combined to form a strong and stable structure. • To design a castle. • To construct 3D nets. • To construct and evaluate my final product.	• To understand how pneumatic systems work. • To design a toy that uses a pneumatic system. • To create a pneumatic system. • To test and finalise ideas against design criteria.	• To explain why food comes from different places around the world. • To explain the benefits of seasonal foods. • To develop cutting and peeling skills. • To evaluate seasonal ingredients. • To design a mock-up using criteria. • To evaluate a dish.	<u>Egyptian Collars</u> • To learn how to sew cross-stitch and to appliqué. • To develop and use a template. • To assemble fabric parts into a fabric product. • To decorate fabric using appliqué and cross-stitch. <u>Cushions</u> • To learn how to sew cross-stitch and to appliqué. • To design a product and its template. • To decorate fabric using appliqué and cross-stitch. • To assemble and complete a cushion.

Electrical systems (KS2 only)				Digital world (KS2 only)	
		Electric poster		Electronics charm	
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.	• Problem solving by suggesting potential features on a Micro: bit and justifying my ideas. • Developing design ideas for a technology pouch. • Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge.	
		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).	• Using a template when cutting and assembling the pouch. • Following a list of design requirements. • Selecting and using the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch. • Applying functional features such as using foam to create soft buttons. • Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm.	
		Evaluate	• Learning to give and accept constructive criticism on own work and the work of others. • 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	• Analysing and evaluating an existing product. • Identifying the key features of a pouch.	
	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.	• 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	

		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).	• To know what the 'Digital Revolution' is and features of some of the products that have evolved as a result. • To know that in Design and technology the term 'smart' means a programmed product. • To know the difference between analogue and digital technologies. • To understand what is meant by 'point of sale display.' • To know that CAD stands for 'Computer-aided design'.
Learning Objectives			• To understand the purpose of information design. • To research a set topic to develop a range of initial ideas. • To research a set topic to develop a range of initial ideas. • To research a set topic to develop a range of initial ideas.	• To research a set topic to develop a range of initial ideas. • To write a program to initiate a flashing LED panel after button press and/or automatically initiate using the Micro:bit light sensing, as part of an eCharm • To create and decorate a foam pouch for the eCharm, using a template • To design a display badge and/or stand using CAD (computer-aided design) software for an eCharm product

Structures			Mechanisms / Mechanical Systems	Cooking and nutrition	Textiles	
Pavilions			Making a slingshot car	Adapting a recipe	Fastenings	
Year 4	Skills	Design	• Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect. • Building frame structures designed to support weight.	• Designing a shape that reduces air resistance. • Drawing a net to create a structure from. • Choosing shapes that increase or decrease speed as a result of air resistance. • Personalising a design.	• Designing a biscuit within a given budget, drawing upon previous taste testing judgements.	• Writing design criteria for a product, articulating decisions made. • Designing a personalised book sleeve.
		Make	• 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. • Reinforcing corners to strengthen a structure. • Creating a design in accordance with a plan. • Learning to create different textural effects with materials	• Measuring, marking, cutting and assembling with increasing accuracy. • Making a model based on a chosen design.	• Following a baking recipe, from start to finish, including the preparation of ingredients. • Cooking safely, following basic hygiene rules. • Adapting a recipe to improve it or change it to meet new criteria (e.g. from savoury to sweet).	• 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	• Evaluating structures made by the class. • Describing what characteristics of a design and construction made it the most effective. • Considering effective and ineffective designs	• Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.	• Evaluating a recipe, considering: taste, smell, texture and appearance. • Describing the impact of the budget on the selection of ingredients. • Evaluating and comparing a range of food products. • Suggesting modifications to a recipe (e.g. This biscuit has too many raisins, and it is falling apart, so next time I will use less raisins).	• 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	Technical	• To understand what a frame structure is. • To know that a 'free-standing' structure is one which can stand on its own	• To understand that products change and evolve over time. • To know that aesthetics means how an object or product looks in design and technology. • To know that a template is a stencil you can use to help you draw the same shape accurately. • To know that a birds-eye view means a view from a high angle (as if a bird in flight). • To know that graphics are images which are designed to explain or advertise something. • To know that it is important to assess and evaluate design ideas and models against a list of design criteria.	• To know that the amount of an ingredient in a recipe is known as the 'quantity.' • To know that it is important to use oven gloves when removing hot food from an oven. • To know the following cooking techniques: sieving, creaming, rubbing method, cooling. • To understand the importance of budgeting while planning ingredients for biscuits.	• 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.
		Additional	• To know that a pavilion is a a decorative building or structure for leisure activities. • 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.			

Learning Objectives	• To create a range of different shaped frame structures. • To design a structure. • To build a frame structure. • To add cladding to a frame structure.	• To build a car chassis. • To design a shape that reduces air resistance. • To make a model based on a chosen design. • To assemble and test my completed product.	• To evaluate existing biscuit products. • To prepare and cook a dish. • To select ingredients and follow a budget. • To take inspiration from existing products. • To make and test a prototype biscuit. • To evaluate a final product.	• To explain the advantages and disadvantages of different types of fastening type. • To design a product to meet design criteria. • To make and test a paper template. • To assemble a book jacket.
----------------------------	---	--	---	---

Electrical systems (KS2 only)				Digital world (KS2 only)	
Torches				Mindful moments timer	
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.	• 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	• 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	• Developing a prototype case for my mindful moment timer. • Creating a 3D structure using a net. • Programming a Micro:bit in the Microsoft Micro:bit editor, to time a set number of seconds/minutes upon button press.	

		Evaluate	• Evaluating electrical products. • Testing and evaluating the success of a final product	• 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.
	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.	• 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 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.	•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.
Learning Objectives			• To learn about electrical items and how they work. • To analyse and evaluate electrical products. • To design a product to fit a set of specific user needs. • To make and evaluate a torch.	• To evaluate existing products. • To develop design criteria. • To program and control a product. • To develop and communicate ideas. • To develop ideas through computer-aided design. • To consider feedback and evaluate.

Structures			Mechanisms / Mechanical Systems	Cooking and nutrition	Textiles	
Bridges			Pop-up book	What could be healthier?	Stuffed Toys	
Year 5	Skills	Design	• Designing a stable structure that is able to support weight. • Creating a frame structure with a focus on triangulation.	• Designing a pop-up book which uses a mixture of structures and mechanisms. • Naming each mechanism, input and output accurately. • Storyboarding ideas for a book.	• Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients. • Writing an amended method for a recipe to incorporate the relevant changes to ingredients. • Designing appealing packaging to reflect a recipe.	• Designing a stuffed toy, considering the main component shapes required and creating an appropriate template. • Considering the proportions of individual components.
		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. • Explaining why selecting appropriating materials is an important part of the design process. • Understanding basic wood functional properties	• Following a design brief to make a pop-up book, neatly and with focus on accuracy. • Making mechanisms and/or structures using sliders, pivots and folds to produce movement. • Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.	• Cutting and preparing vegetables safely. • Using equipment safely, including knives, hot pans and hobs. • Knowing how to avoid cross-contamination. • Following a step by step method carefully to make a recipe.	• 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.

	Knowledge	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.	• Evaluating the work of others and receiving feedback on own work. • Suggesting points for improvement.	• Identifying the nutritional differences between different products and recipes. • Identifying and describing healthy benefits of food groups.	• Testing and evaluating an end product and giving point for further improvements.
		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.	• To know that mechanisms control movement. • To understand that mechanisms can be used to change one kind of motion into another. • To understand how to use sliders, pivots and folds to create paper-based mechanisms.	• To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues. • To know that I can adapt a recipe to make it healthier by substituting ingredients. • To know that I can use a nutritional calculator to see how healthy a food option is. • To understand that 'cross-contamination' means bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects.	• 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
		Additional	• To understand the difference between arch, beam, truss and suspension bridges. • To understand how to carry and use a saw safely.	• To know that a design brief is a description of what I am going to design and make. • To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.		

Learning Objectives	• To explore how to reinforce a beam (structure) to improve its strength. • To build a spaghetti truss bridge. • To build a wooden truss bridge. • To complete, reinforce and evaluate my truss bridge.	• To design a pop-up book. • To follow my design brief to make my pop-up book. • To use layers and spacers to cover the working of mechanisms. • To create a high-quality product suitable for a target user.	• To understand how ingredients are reared and processed. • To make adaptations to design a recipe. • To evaluate nutritional content. • To practice food preparation skills. (The main course) • To design a product label. • To follow and make an adapted recipe.	• To design a stuffed toy. • To sew a blanket stitch. • To create and add decorations to fabric. • To use a blanket stitch to assemble the components of a stuffed toy.
---------------------------------------	--	--	---	--

Electrical systems (KS2 only)				Digital world (KS2 only)	
		Doodlers		Monitoring devices	
Year 5	Skills	Design	- 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.	- 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	- 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.	- 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	- Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses. - 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.	- 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). - Explaining how my product would be useful for an animal carer including programmed features.	
	Knowledge	Technical	- 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	- 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 know that product analysis is critiquing the strengths and weaknesses of a product. - To know that 'configuration' means how the parts of a product are arranged.	- To understand key developments in thermometer history. - To know events or facts that took place over the last 100 years in the history of plastic, and how this is changing our outlook on the future. - To know the 6Rs of sustainability. - To understand what a virtual model is and the pros and cons of traditional vs CAD modelling	

Learning Objectives	• To understand how motors are used in electrical products. • To investigate an existing product to determine the factors that affect the product's form and function. • To apply the findings from research to develop a unique product. • To develop a DIY kit for another individual to assemble their product.	• To carry out research to develop design criteria. • To write a program to monitor the ambient temperature, including an alert. • To generate creative and unique micro:bit case, stand or housing ideas. • To learn about and practise 3D CAD skills.
---------------------------------------	---	--

Structures			Mechanisms / Mechanical Systems	Cooking and nutrition	Textiles	
Playgrounds			Automata toys	Come dine with me	Waistcoats	
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.	• Experimenting with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement. • Understanding how linkages change the direction of a force. • Making things move at the same time. • Understanding and drawing cross-sectional diagrams to show the inner-workings of my design.	• Writing a recipe, explaining the key steps, method and ingredients. • Including facts and drawings from research undertaken.	• Designing a waistcoat in accordance to a specification linked to set of design criteria. • Annotating designs, to explain their decisions.
		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	• Measuring, marking and checking the accuracy of the jelutong and dowel pieces required. • Measuring, marking and cutting components accurately using a ruler and scissors. • Assembling components accurately to make a stable frame. • Understanding that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles. • Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set	• 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.	• 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. • 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

	Knowledge	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.	• Evaluating the work of others and receiving feedback on own work. • Applying points of improvement to their toys. • Describing changes they would make/do if they were to do the project again.	• 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 when scoring others' dishes, and when evaluating their own throughout the planning, preparation and cooking process. • Evaluating health and safety in production to minimise cross contamination.	• Reflecting on their work continually throughout the design, make and evaluate process.
		Technical	• To know that structures can be strengthened by manipulating materials and shapes.	• To understand that the mechanism in an automata uses a system of cams, axles and followers. • To understand that different shaped cams produce different outputs	• 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).	• To understand that it is important to design clothing with the client/ target customer in mind. • To 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.
		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 an automata is a hand powered mechanical toy. • To know that a cross-sectional diagram shows the inner workings of a product. • To understand how to use a bench hook and saw safely. • To know that a set square can be used to help mark 90° angles.		

Learning Objectives	• To design a playground with a variety of structures. • To build a range of structures. • To improve and add detail to structures. • To create a surrounding landscape.	• To prepare wood for assembly by measuring, marking and cutting each piece. • To assemble the automata frame components and supports with the help of an exploded diagram. • To explore the relationship between cam profiles and follower movement to inform a design decision. • To apply the housing and finishing touches to the automata frame.	• To explain the use of complementary flavours. • To research and design a three-course meal. • To explain recipe choices. • (To start...) To apply culinary skills and knowledge. • (The main course) To apply culinary skills and knowledge. • (Dessert) To apply culinary skills and knowledge.	• To design a waistcoat. • To mark and cut fabric according to a design.. • To assemble a waistcoat. • To decorate your waistcoat.
----------------------------	---	--	---	---

Electrical systems (KS2 only)				Digital world (KS2 only)	
		Steady Hand Game		Navigating the world	
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'.	• 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	• 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.	• 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	• 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.	• 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. • 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.
	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.	• 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 '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'	• 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.
Learning Objectives			• To research and analyse a range of children's toys. • To design a steady hand game. • To construct a stable base. • To assemble electronics and complete their electronic game.	• To write a design brief and criteria based on a client request. • To write a program to include multiple functions as part of a navigation device. • To develop a sustainable product concept. • To develop 3D CAD skills to produce a virtual model. • To present a pitch to 'sell' the product to a specified client.

Whole School Resources and Equipment Lists

Resources by Year Group - EYFS/KS1/KS2			
Drawing	Painting and Mixed Media	Sculpture and 3D	Craft and Design
EYFS □ Items to draw (such as a vase with flowers or a plant) □ A selection of small objects (toy cars, buttons, cotton buds, pieces of fruit, flowers etc.) □ Still life objects to draw Y2 □ Small tactile objects □ Pillow case, bag or cloths □ Soft toy (Teacher's own and children to supply from home or use from school) □ A variety of textured paper (such as: wallpapers, card and tissue paper) □ A4 cardboard viewfinders Y3 □ Still life objects to draw □ Real flowers □ Teabags for staining paper (optional) □ Cardboard viewfinders Y4 □ Length of ribbon □ Interesting objects to draw (such as: umbrellas, hats, clothes hangers, piles of books, boxes etc.) Y5 /Y6 □ Materials to create textures on collagraph plates	EYFS □ Natural objects (feathers, grass, flower buds or heads, leaves twigs, pine cones) □ Collected sticks □ Mud □ Bowls or containers □ Spoon or sticks for mixing mud paint □ A painting surface □ Mixed-media scraps (crepe paper, fabric, tissue paper, corrugated card, magazines, ribbon, wool, foil etc.) □ Loose parts (buttons, corks, bottle lids etc.) □ Magazines □ Teabags □ Large paper or paper on a roll □ Tarpaulin (optional) □ Lego bricks or similar for printing Y1 □ Paper plates (one each) □ Drinking straws Y2 □ A range of materials for collage (such as: coloured paper, tin-foil, cellophane, tissue, crepe paper, scraps of fabric and colourful magazine pages) □ Magnifying glasses □ Painting tools (such as: brushes, sponges, cotton buds, bits of card,	EYFS □ Tuff tray or another flat clean surface □ Sticky back plastic □ A selection of small world animals □ Pictures of animals □ Natural loose materials (such as: leaves, twigs, petals, seed pods, bark etc.) Y1 □ Card from packaging boxes or similar Y2 □ A range of everyday objects that can be pressed into the clay Y3 □ Hairspray or fixative □ Coloured spices (such as: turmeric, paprika, cinnamon, nutmeg) □ Flour □ Couscous, bulgur wheat, lentils, coarse flour, seeds, sand or □ Strong card; packaging boxes or similar □ Cereal box cardboard □ Art straws □ Junk modelling packaging □ Cardboard tubes e.g. wrapping paper inner tubes □ Clean newspaper sheets □ Kitchen roll □ String or pipe cleaners	EYFS □ Materials to cut (such as: paper, thin card, thick card, corrugated card, magazines or catalogues, newspaper, thin fabric, crepe paper, tissue paper) □ Pipe cleaners and/ or straws □ Penne pasta □ Beads □ Wool, string and/or ribbon □ Colander □ Empty water bottles □ Hole-punched card □ Blank card (optional) □ Hole-punch (optional) □ Scrap paper and card (thick and thin) □ Cardboard tubes Y1 □ Cardboard (cereal boxes or similar) □ Shoeboxes or photocopy paper boxes □ Things to thread on wool (such as: beads, drinking straws) Y2 □ Wool roving (also called 'wool tops') in white - 10g per pair of children □ Wool roving in a mixture of colours - approx. 5g per pair of children

	foil and forks) Y3 ☐ Rags and sponges Y4 ☐ Liquid soap - a small amount to mix into paint ☐ A range of everyday objects to print with (such as: string, bubble wrap, egg boxes, interesting packaging, cotton reels etc.) ☐ Cotton bed sheet to print onto OR similar fabric OR large pieces of card (one large piece per group of pupils) ☐ Materials that add texture like sand, rice, lentils ☐ Objects to arrange as a still life Y5 ☐ Photograph of each child OR mirrors to draw from ☐ Text to be used as part of a drawing ☐ Paper for collage	☐ Paper for adding texture (such as: tissue, crepe, parcel paper) ☐ Coloured acetate sheets Y4 ☐ Bars of soap (one per child) ☐ Carving tools for soap (such as: cocktail sticks, old teaspoons, clay modelling tools, large paper clips, lollipop sticks) ☐ 1mm thick plastic-coated wire (approximately 90cm per pupil) ☐ A few pairs of pliers (optional) ☐ A variety of clean used packaging destined for the recycling bin (such as: boxes, foil and plastic wrappers) Y5 ☐ Cardboard boxes (shoe boxes or photocopier paper boxes are ideal) - one per group ☐ Range of materials (such as: powder paint, glitter, charcoal, chalk, coloured sand, ready-mix paint - see Lesson plan for advice) ☐ Protective goggles ☐ Digital cameras or similar ☐ Torches ☐ Large pieces of fabric/ materials (such as: foil or bubble wrap and interesting objects readily available around school to cover furniture)	☐ Bubble wrap - 4m of a metre-width roll ☐ Tea towels, one per pair of children ☐ Two bars of soap ☐ Clean, empty milk containers or similar for pouring water Y3 ☐ Teabags and /or coffee ☐ Mixture of paper (such as: newspapers, tissue paper, wallpaper, sugar paper, metallic) ☐ Brown paper bags or packaging paper ☐ Greaseproof paper ☐ Long Cardboard tubes (one or two per pupil) Y4 ☐ Examples of items made using patterned fabric ☐ Exotic plants and fruits Y6 ☐ Clipboards	
--	---	--	---	--



Teacher guidance: Working with clay

What type of clay should I use?

Choosing the type of clay to use will have an impact on the cost and the practicalities of this unit of work. There are benefits to both and you will need to choose what works best for your children and school setting. Whichever clay you choose, read and follow the safety instructions and explain to the children how to handle it safely.



Standard clay

Standard clay would traditionally be fired in a kiln to make it durable. In school, standard clay can just be dried at room temperature rather than fired. Although it won't be as strong as fired clay, it will be suitable for most primary school projects if you choose a medium-grogged hand-building clay. 'Grogged' just means a clay mix that contains particles that make it stronger and less prone to cracking. Standard clay can actually be easier for children to manipulate and it can be softened to make it more workable. It can also be re-used many times as long as it is stored in an airtight container. This clay can be painted quite successfully once dry.

Air-drying clay

Air-dry clay is very convenient if you know that each child will be keeping every piece they make during lessons. It typically dries out faster than standard clay, so needs to be stored for less time while it dries. It is easy to paint a finished piece. It can be trickier to work with as the surfaces dry quickly and it can be more expensive.

Equipment for working with clay

Successful clay work with children doesn't require lots of specialist equipment. The tables will need to be protected with a tablecloth of some sort and each child will need a modelling board to work on. You can just work directly on top of 'wipe-down' tablecloths, but using a board makes it easier to move finished work to be dried at the end of a lesson.

A wide variety of plastic and wooden tools are available from educational suppliers. An ideal selection would include rolling pins and modelling tools with different cutting and shaping surfaces. 'Loop tools' are useful for removing smaller areas of clay.



Equipment for multiple art mediums

☐ PVA glue, pots and spreaders ☐ Glue sticks ☐ Scissors (right and left handed) ☐ Sticky tape ☐ Masking tape ☐ Sticky tack (Blu Tac) ☐ Paintbrushes - thick ☐ Poster paint ☐ Acrylic paint ☐ Water pots ☐ Painting trays or dishes ☐ Ready-mix paint in primary colours ☐ Ready-mix paint in black ☐ Ready-mix paint in white ☐ Watercolour paints ☐ Metallic paint ☐ Black ink ☐ Sponges for painting ☐ Fabric paint ☐ Oil pastels ☐ Soft pastels ☐ Fixative OR hairspray ☐ Charcoal ☐ Sketching pencils (B Grade) ☐ Sketching pencils (H Grade) ☐ Black fine liners ☐ Handwriting pens ☐ Marker pens ☐ Sharpies ☐ Graphite sticks ☐ Wax crayons ☐ Felt tips ☐ Chalk ☐ Colouring pencils ☐ Wax crayons ☐ Camera or tablet	☐ A3 or larger thick paper or card ☐ Large paper or card ☐ Buff coloured paper A3 or A4 ☐ A4 plain paper sheets ☐ A3 or larger paper or card for painting ☐ A range of paper for mounting finished work ☐ Dark coloured A2 sugar paper ☐ Sugar paper ☐ Cartridge paper ☐ A4 thin coloured card ☐ A4 thin white card ☐ Sheets of cardboard ☐ Coloured paper and card ☐ Tracing paper ☐ Roll of white paper or lining paper ☐ Black paper or card ☐ Bulldog clips, clothes peg or string for joining things ☐ Coloured craft paper ☐ Tissue paper ☐ Coloured tissue paper ☐ Black sugar paper ☐ Patterned paper ☐ Paper plates ☐ Acetate sheets suitable for printing ☐ Coloured cellophane ☐ Tissue or cellophane in primary colours ☐ Modelling clay ☐ Air-dry Clay ☐ Modelling boards ☐ Plastic and wooden modelling tools ☐ Loop tools ☐ Rolling pins ☐ Clay wire (for cutting portions) ☐ Playdough ☐ Play dough or plasticine in primary colours ☐ Play dough tools (such as: modelling tools, rolling pins, pattern rollers, cutters, small child-safe knives, scissors, tweezers) ☐ Modroc
---	---

☐ Mirrors ☐ String ☐ Scissors ☐ Rulers ☐ Rubbers ☐ Staplers ☐ Hole punch ☐ Split pins ☐ Paper clips ☐ 30 poly-pockets, acetate sheets or similar transparent material ☐ Aprons ☐ Newspaper		☐ Wool in a range of colours ☐ Other threads for plaiting and knotting (e.g. scraps of embroidery thread) ☐ Strips of scrap fabric ☐ Ribbon ☐ Calico or white cotton fabric ☐ Ink palettes ☐ Thick paint brushes ☐ Polystyrene sheets suitable for printing ☐ Printing ink ☐ Rollers ☐ Trays for printing ☐ Sharpies	
---	--	---	--

Appendix 1 – EYFS Core Learning

Core Learning	DT Unit 1		DT Unit 2		DT Unit 3		DT Unit 4	
	Workshop <u>Junk Modelling (x5)</u>		Cooking and nutrition <u>Soup (x5)</u>		Textiles <u>Bookmarks</u>		Structures <u>Boats</u>	
	Exploring materials through junk modelling, children develop their scissor skills and awareness of different materials and joining techniques. Children begin to make verbal plans and material choices before starting and problem solve while making their model.		Learning about vegetables and where they come from while preparing to make a soup. Children describe the taste of a range of vegetables and design a soup recipe as a class. They practice cutting skills and prepare the vegetables for their class soup before testing the final product.		Developing fine motor skills through a range of threading activities before moving on to use binka and a needle. Children design a bookmark, considering what to include and why and then follow their designs to complete their bookmarks.		Considering the properties of materials through water play, children discover which materials are waterproof and whether they float or sink. Children evaluate a variety of boats and use their new-found knowledge to design and make a boat that is waterproof and floats.	
	join, stick, cut, bend, slot, scissors, measure, materials, fix		fruit, vegetables, safety, knife, blade, tool, edge, handle, chop, slice, cut, saucepan, blender, chopping board, hob, boil, blend, mix, packaging, recyclable, metal, plastic, reusable		thread, weave, pattern, sew, sewing needle, embroider, design. evaluate		waterproof, absorb, prediction, variable, experiment, investigation, float, sink, junk	
Seasonal Lessons	Autumn Lesson		Christmas Lesson		Spring Lesson		Easter Lesson	
	<u>Hibernation box (x1)</u>		<u>Sliding picture (x1)</u>		<u>Flower threading (x1)</u>		<u>Hanging decoration (x1)</u>	
	Designing and making a hibernation box, children consider Junk modelling (5 lessons) the function of		Coming soon! Creating a sliding mechanism chimney picture,		Creating their own threading cards, children practice using		Designing a hanging egg decoration,	
							Researching, designing and	

	a product	children Soup (5 lessons) develop their cutting and joining skills.	scissors and a hole punch.	children make choices about how to decorate.	making a colourful and healthy salad.
--	-----------	---	----------------------------	--	---------------------------------------

Appendix 2 – Year 1 Core Learning

	Cooking and nutrition		Structures		Textiles
	<u>Fruit and vegetables x4</u>		<u>Constructing a windmill x4</u>		<u>Puppets x4</u>
	Handle and explore fruits and vegetables and learn how to identify which category they fall into, before undertaking taste testing to establish chosen ingredients for a smoothie they will make, with accompanying packaging.		Design, decorate and build a windmill for a mouse (client) to live in, develop an understanding of different types of windmill, how they work and their key features. Look at real existing examples and the functions that they carry out.		Explore different ways of joining fabrics before creating hand puppets based upon characters from a well-known fairytale. Develop technical skills of cutting, glueing, stapling and pinning
	blender, carton, fruit, healthy, ingredients, peel, peeler, recipe, slice (verb), smoothie, stencil, template, vegetable		client, design, evaluation, net, stable, strong, structure, test, weak, windmill, windmill axle, windmill structure, windmill turbine		decorate, design, fabric, glue, model, hand puppet, safety pin, staple, stencil, template
	Mechanisms				Mechanisms
	<u>Making a moving story book x4</u>				<u>Wheels and axles x4</u>
	Experiment with sliders before				Learn about the main components

	planning and making three pages of a moving story book, based on a familiar story, drawing the page backgrounds, creating the moving parts and assembling it.				of a wheeled vehicle. Develop understanding of how wheels, axles and axle holders work; problem-solve why wheels won't rotate; to design and build their own vehicle designs
	assemble, design, evaluation, mechanism, model, sliders, stencil, target audience, template, test				axle, axle holder. chassis. diagram, dowel. equipment. mechanism. wheel
	★ Celebrate KS1's achievements in D&T, with a gallery of their products. Rotate the classes and ask them to provide feedback and ask questions to their peers ★ Set an invention challenge with scrap and recycled materials. Provide the pupils with a variety of textures and joining methods before sharing their ideas ★ Extra-curricular trips. You could plan to take the pupils to see what happens in the world of production, material sourcing, invention and mechanisms ★ As overflow time to complete units where other school events takeover or to provide more time for classes to complete projects				

Appendix 3 – Year 2 Core Learning

	Mechanisms		Mechanical Systems		Structures
	<u>Fairground wheel x4</u>		<u>Making a moving monster x4</u>		<u>Baby bears chair x4</u>

	Design and create a functional Ferris wheels, consider how the different components fit together so that the wheels rotate and the structure stands freely. Select appropriate materials and develop their cutting and joining skills		After learning the terms: pivot, lever and linkage, pupils design a monster that will move using a linkage mechanism. Pupils practice making linkages and experiment with various materials to bring their monsters to life.		Using the tale of Goldilocks and the Three Bears as inspiration, pupils help Baby Bear by making him a brand-new chair, exploring different shapes and materials. When designing the chair, they consider his needs and what he likes.
	design, design criteria, wheel, Ferris Wheel, pods, axle, axle holder, frame, mechanism				design criteria, man-made, natural, properties, structure, stable, shape, model, test
	Cooking and nutrition		axle, design criteria, input, linkage, mechanical, output, pivot, wheel		Textiles
	<u>A balanced diet x4</u>				<u>Pouches x4</u>
	Explore and learn what forms a balanced diet, pupils will taste test ingredient combinations from different food groups that will inform a wrap design of their choice which will include a healthy mix of protein, vegetables and dairy				Introduction to sewing. Pupils make their own template, accurately cut their fabric and sew a basic running stitch.
	balanced diet, balance, carbohydrate, dairy, fruit, ingredients, oils, sugar,				decorate, fabric, fabric glue, knot, needle, needle threader, running stitch, sew, template,

	protein, vegetable, design criteria				thread
	★ Celebrate KS1's achievements in D&T, with a gallery of their products. Rotate the classes and ask them to provide feedback and ask questions to their peers ★ Set an invention challenge with scrap and recycled materials. Provide the pupils with a variety of textures and joining methods before sharing their ideas ★ Extra-curricular trips. You could plan to take the pupils to see what happens in the world of production, material sourcing, invention and mechanisms ★ As overflow time to complete units where other school events takeover or to provide more time for classes to complete projects				

Appendix 4 – Year 3 Core Learning

	Textiles		Mechanical systems		Cooking and nutrition
	<u>Cross stitch and appliqué x 4</u> Cushions or Egyptian collars		<u>Pneumatic toys x4</u>		<u>Eating seasonally x4</u>
	Introduce two new skills to add to the pupils' repertoire: cross stitch and appliqué. Pupils apply their knowledge to the design, decoration and assembly of their own cushions or Egyptian collars.		Design and create a toy with a pneumatic system, learning how trapped air can be used to create a product with moving parts. Pupil are introduced to thumbnail sketches and exploded diagrams.		Pupils discover when and where fruits and vegetables are grown and learn about seasonality in the UK. They look at the relationship between the colour of fruits and vegetables and their health benefits by making three dishes.

	<u>Cushions</u> appliqué, cross-stitch, design, equipment, fabric, patch, running stitch, thread, seam, texture, knot		mechanism, lever, pivot, linkage system, pneumatic system, input, output, component, thumbnail sketch, research, adapt, properties, reinforce, motion		climate, dry climate, exported, imported, Mediterranean climate, nationality, nutrients, Polar climate, recipe, seasonal food, seasons, temperate climate, tropical climate
	<u>Egyptian collars</u> appliqué, cross-stitch, fabric, running stitch, patch, thread, embellish, template, cotton, silk, polyester, wrinkle, tear, water-resistant, breathable, matt, shiny, biodegrade, pinking				
	Digital world		Electrical systems		Structures
	<u>Electronic charm x4</u>		<u>Electronic poster x4</u>		<u>Constructing a castle x4</u>
	Design, code, make and promote a Micro:bit electronic charm to use in low-light conditions, developing their understanding of programming to monitor and control products to solve a design scenario.		An introduction to information design and electrical systems, pupils create an electric poster using a basic circuit to develop a museum display about The Romans.		Learning about the features of a castle, pupils design and make one of their own. They will also be using configurations of handmade nets and recycled materials to make towers and turrets before constructing a stable base.

Appendix 5 – Year 4 Core Learning

	Textiles		Mechanical systems		Cooking and nutrition
	<u>Fastenings x4</u>		<u>Making a slingshot car x4</u>		<u>Adapting a recipe x4</u>
	Building upon their sewing skills from previous years, pupils design and create a book sleeve; exploring a variety of fastenings and selecting the most appropriate for their design based on strength and appropriate-use.		Transform lollipop sticks, wheels, dowel and straws into a moving car. Pupils use a glue gun to construct, make the launch mechanism, design and create the chassis of a vehicle using nets.		Work in groups to adapt a simple biscuit recipe, to create the tastiest biscuit ensuring that their creation comes within the given budget of overheads and costs of ingredients.
	aesthetic, assemble, book sleeve, design criteria, evaluation, fabric, fastening, prototype, net, running-stitch, stencil, target audience, target customer, template		chassis, energy, kinetic, mechanism, air resistance, design, structure, graphics, research, model, template		design criteria, research, texture, innovative, aesthetic, measure, cross-contamination, diet, processed, packaging
	Digital world		Electrical systems		Structures
	<u>Mindful moments timer x6</u>		<u>Torches x 4</u>		<u>Pavilions x4</u>
	An alternative to the original mindful moments timer unit, including a greater focus on		Pupils apply their scientific understanding of electrical circuits to create a torch made		Exploring pavilion structures, learning about what they are used for and investigate how to

	evaluation, use of the virtual micro:bit and new video content.		from recycled and reclaimed materials and objects. They design and evaluate their product against set design criteria.		create strong and stable structures before designing and creating their own pavilions, complete with cladding
	advantage, annotate, assemble, aesthetic, block, brand, brand identity, bug, computer-aided design (CAD), clipart, coding, criteria, debug, design, develop, disadvantage, display, ergonomic, evaluate, exhibition, feedback, form, function, join, logo, loop, mindfulness, model, net, program, prototype, research, script, sketchpad, test, timer, user, variable		battery, bulb, buzzer, conductor, circuit, circuit, diagram, electricity, insulator, series circuit, switch, component, design, design criteria, diagram, evaluation, LED, model, shape, target, audience, input, recyclable, theme, aesthetics, assemble, equipment, ingredients, packaging, propertie		aesthetic, cladding, design criteria, evaluation, frame structure, function, inspiration, pavilion, reinforce, stable, structure, target audience, target customer, texture, theme

Appendix 6 – Year 5 Core Learning

	Mechanical systems		Cooking and nutrition		Textiles
	<u>Making a pop-up book x 4</u>		<u>What could be healthier x4</u>		<u>Stuffed toys x4</u>

	Create a four-page pop-up story book design, incorporating a range of functional mechanisms that use levers, sliders, layers and spacers to give the illusion of movement through interaction.		Research and modify a traditional Bolognese sauce recipe to make it healthier. Cook improved versions, creating appropriate packaging and learn about where the ingredients the importance of animal welfare when farming cattle.		Create a stuffed toy by applying skills learnt in previous units. Introduce blanket stitch.
	design, input, motion, mechanism, criteria, research, reinforce, model		beef, reared, processed, ethical, diet, ingredients, supermarket, farm, balanced		accurate, annotate, appendage, blanket-stitch, design criteria, detail, evaluation, fabric, sew, shape, stuffed toy, stuffing, template
	Digital world		Structures		Electrical systems
	<u>Monitoring devices x4</u>		<u>Bridges x4</u>		<u>Doodlers x4</u>
	Program a Micro: bit animal monitoring device that will alert the owner when the temperature is not optimal. Develop 3D CAD skills by learning how to navigate the Tinkercad interface and essential tools.		After learning about various types of bridges and exploring how the strength of structures can be affected by the shapes used, create their own bridge and test its durability - using woodworking tools and techniques.		Explore series circuits further and introduce motors. Explore how the design cycle can be approached at a different starting point, by investigating an existing product, which uses a motor, to encourage pupils to problem-solve and work out how the product has been

					constructed, ready to develop their own.
	monitoring device, electronic, sensor, thermoscope, thermometer, research, design brief, design criteria, development, inventor, vivarium, programming loop, programming comment, alert ambient, Boolean, duplicate, copy, value, variable, model, sustainability, plastic, microplastics, decompose, plastic pollution, man-made, synthetic		beam bridge, arch bridge, truss bridge, strength, technique, corrugation, lamination, stiffness, rigid, factors, stability, visual appeal, aesthetics, joints, mark out hardwood, softwood, wood file/rasp, sandpaper/glasspaper, bench hook/vice, tenon saw/coping saw, assemble, material properties, reinforce, wood sourcing, evaluate, quality of finish, accuracy		circuit component, configuration, current, develop, DIY, investigate, motor, motorised, problem solve, product analysis, series circuit, stable, target user

Appendix 7 – Year 6 Core Learning

	Digital world		Structures		Electrical systems
	<u>Navigating the world x 4</u> <u>(or 5)</u>		<u>Playgrounds x4</u>		<u>Steady hand game x4</u>

	Program a navigation tool to produce a multifunctional device for trekkers. Combine 3D virtual objects to form a complete product concept in 3D computer-aided design modelling software.		Design and create a model for a new playground featuring five apparatus, made from three different structures. Using a footprint as the base, practice visualising objects in plain view and get creative including natural features.		Design and create a steady hand game, use nets to create the bases and apply knowledge of electrical circuits to build an operational circuit with a buzzer that completes the circuit when the handle makes contact with the wire.
	smart, smartphone, equipment, navigation, cardinal compass, application (apps), pedometer, GPS tracker, design brief, design criteria, client, function, program, duplicate, replica, loop, variable, value, if statement, Boolean, corrode, mouldable, lightweight, sustainable design, environmentally friendly, biodegradable, recyclable, product lifecycle		apparatus, design criteria, equipment, playground, landscape features, cladding		assemble, battery, battery pack, benefit, bulb, bulb holder, buzzer, circuit, circuit symbol, component, conductor, copper, design, design criteria, evaluation, fine motor skills, fit for purpose, form, function, gross motor skills, insulator, LED, user
	Cooking and nutrition		Textiles		Mechanical systems
	<u>Come dine with me x4</u>		<u>Waistcoats x4</u>		<u>Automata toys x4</u>
	Research and prepare a three-course meal and taste-test and		Select fabrics, use templates, pin, decorate and stitch		Use woodworking skills, pupils construct an automata;

	score their food. Research the journey of their main ingredient from 'farm to fork' or write a favourite recipe.		materials together to create a waistcoat for a person or purpose of their choosing. Create or use a pattern template to fit a desired person or item (e.g. teddy bear).		measuring and cutting their materials, assembling the frame, choosing cams and designing the characters that sit on the followers to form an interactive shop display.
	equipment, flavours, ingredients, method, research, recipe, bridge method, cookbook, cross-contamination, farm to fork, preparation, storyboard		annotate, decorate, design criteria, fabric, target customer, waistcoat, waterproof		accurate, assembly-diagram, automata, axle, bench hook, cam, clamp, component, cutting list, diagram, dowel, drill bits, exploded-diagram, finish, follower, frame, function, hand drill, jelutong, linkage, mark out, measure, mechanism, model, research, right-angle, set square, tenon saw