Bramcote Hills Primary School

‘Make the future better for all’

D.T.

Curriculum Depth Map

Contents

Bramcote Hills Primary School

'Make the future better for all'

Curriculum Depth Map – Design and Technology

Aims

The national curriculum for design and technology aims to ensure that all pupils:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook.

Intent

At BHPS we provide children with a challenging and engaging Design and Technology curriculum that develops creativity, sets challenges, engages, and inspires children and equips them with the conceptual and procedural knowledge they need to experiment, invent and create their own products and designs. The curriculum is designed to allow pupils to further their understanding of Design and Technology, in order to use creativity and imagination, to design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values.

Throughout their study, the children will acquire and develop the conceptual and procedural knowledge that has been identified within each component of learning and across each year group. Conceptual knowledge is taught in sequences that build on prior learning. Procedural knowledge is a golden thread that runs throughout the units and is, itself, carefully sequenced and matched, wherever possible, to the appropriate conceptual knowledge.

School recognises the distinction between *conceptual* and *procedural* knowledge. Conceptual knowledge being the facts, rules and principles and the relationships between them. It can be described as '*knowing that*'. In contrast procedural knowledge is knowledge of methods or processes that can be performed. It can be described as '*knowing how*'. Conceptual knowledge guides the product design process, while disciplinary knowledge enables the practical creation of the product.

Conceptual Knowledge

In Design and Technology (DT), "conceptual knowledge" refers to the core ideas and understanding of design principles.

- Understanding the design cycle (research, design, make, evaluate)
- Knowing the key elements of a good design (functionality, aesthetics, sustainability)
- Grasping concepts like structure, mechanism, and systems
- Technical Knowledge

For example: Understand that a lever is a simple mechanism to amplify force

Procedural Knowledge

In Design and Technology (DT), "disciplinary knowledge" refers to the specific skills and methods used within the design process, including knowledge of materials, tools, techniques, and how to apply them effectively to create a product; essentially, "what" to design versus "how" to design it.

- Proficiency in using specific tools and techniques (cutting, sewing, soldering)
- Knowledge of material properties (strength, flexibility, durability)
- Understanding safety procedures when working with tools and materials
- Applying appropriate design thinking strategies to solve problems

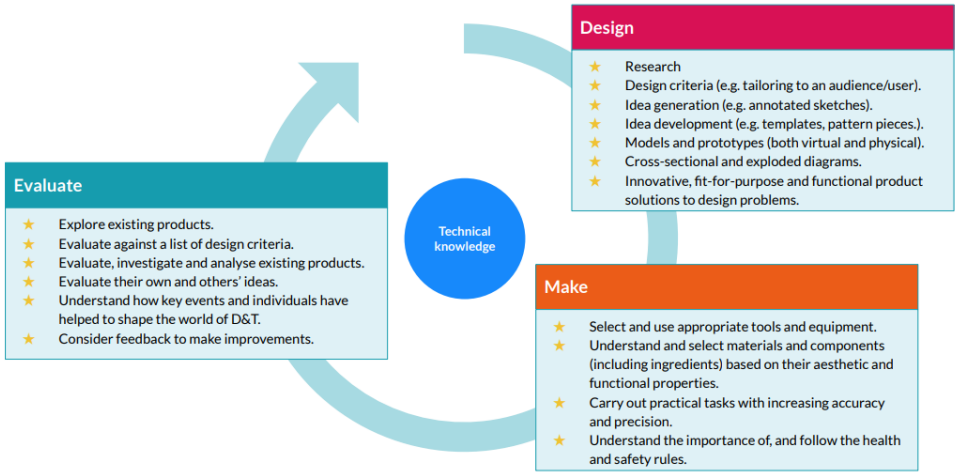
For example: Know how to cut and join wood to create a leave using appropriate tools like a saw and screws

Key Primary themes - Our design technology curriculum at BHPS has been designed and sequenced so that the children build upon their knowledge through key concepts that are taught throughout the DT curriculum from EYFS to Year 6.

Implementation

Our design and technology curriculum provides a clear and comprehensive scheme of work that is based on the Kapow Curriculum. It is sequential, allowing pupils to build their conceptual and procedural knowledge, applying them in a range of ways. Our design and technology curriculum follows the design, make and evaluate cycle. The design process should be relevant in context, to give meaning to learning. While making, children should be given choice and a range of tools to choose freely from. When evaluating, children should be able to evaluate their own products against a design criteria. Each of these steps should be rooted in technical knowledge and vocabulary. This allows time for teaching, practice and repetition – both in a year group and across key stages. Curriculum coverage is sequenced carefully from EYFS to Year 6 which allows key primary themes, conceptual and procedural knowledge to be developed and revisited at a deeper level of learning.

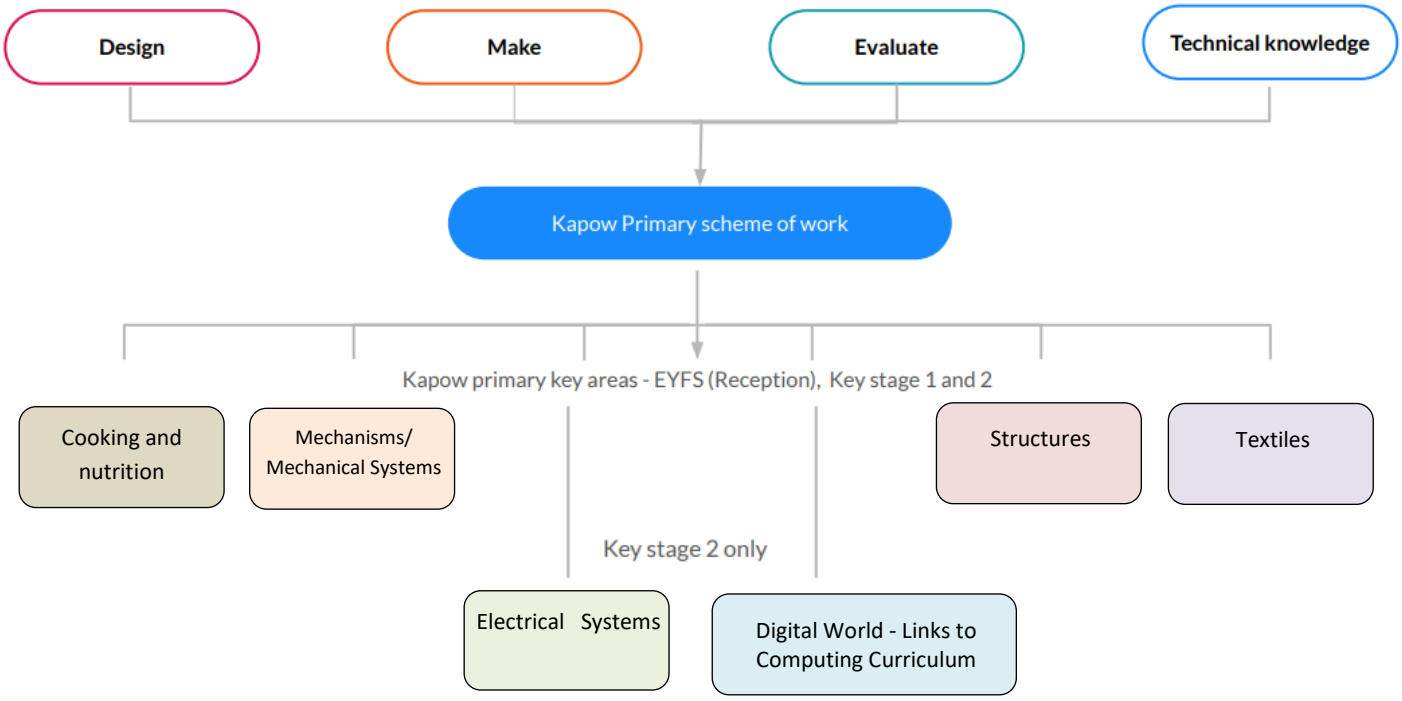
Our design and technology curriculum is designed to allow children time to think, discuss, practise, explore and embed. This allows time for teaching, practice and repetition – both in a year group and across both key stages. Curriculum coverage is mapped out carefully from EYFS to Year 6 which allows some key concepts to be developed at a deeper level of learning, understanding and mastery. There will be, where applicable, links to develop the children's learning experiences.



Each stage of the design process is underpinned by technical knowledge which encompasses the contextual, historical and technical understanding required for each strand.

Key primary themes, conceptual and procedural knowledge are revisited with increasing complexity in a spiral curriculum model. This allows pupils to revise and build on their previous learning. Components of learning allow for procedural knowledge to be developed through practical activities, which encourage experimental and exploratory learning with pupils using sketchbooks to document their ideas.

Lessons seek to introduce new conceptual knowledge and concepts in small, logical steps, in line with cognitive load theory. Children's knowledge will be built up gradually, making links, wherever possible, to previous knowledge and other areas of learning. We seek to further children's ability to commit new learning to long term memory by assessing their retention and revisiting key knowledge. Potential misconceptions will be addressed through carefully selected lesson content and effective feedback.



Impact

The design and technology curriculum is designed in such a way that pupils are involved in evaluation, dialogue and decision making about the quality of their outcomes and the improvements they need to make. This means that pupils not only know key knowledge and information about design and technology but are able to talk confidently about their own learning journey and have a growing understanding of how to improve. The impact of our design and technology teaching can be constantly monitored through both formative and summative assessment opportunities, such as low-stakes tests/quizzes, rapid recall opportunities, varied knowledge-catcher activities and an opportunity to share they knowledge of key vocabulary. Pupil outcomes from each focused activity within a lesson can be used formatively to consider next steps for the class or individual, and/or summatively to inform summaries for the next class teacher or for parents.

Pupils should leave BHPS equipped with the requisite skills and knowledge to succeed in key stage 3 design and technology. They should be equipped with a range of techniques and the confidence and creativity to form a strong foundation for their design and technology learning at Key Stage 3 and beyond

The expected impact of following the Design and Technology Depth Map is that children will:

- Pupils will have clear enjoyment and confidence in design and technology that they will then apply to other areas of the curriculum
- Pupils will ultimately know more, remember more and understand more about Design Technology
- As 'designers' pupils will develop knowledge and attributes they can use beyond school and into adulthood.
- Produce creative work, exploring and recording their ideas and experiences
- Evaluate and analyse products using subject-specific language
- Meet end of key stage expectations outlined in the national curriculum design and technology

During the following Staging Points these will be identified as:

Foundation

The principal focus of Design and Technology teaching in Foundation is to foster curiosity about the world around them. By the end of EYFS, pupils will:

- be able to explore and choose a range of materials to create and make things
- be able to investigate how things work and
- draw, build and make things which fulfil a function

KS1

The principal focus of design and technology teaching in KS1 focuses on developing practical skills and understanding through designing and making. By the end of Key Stage 1, pupils will:

- recall the initial, sticky and procedural knowledge specified within the curriculum depth map learn the knowledge and skills needed to design and make products for a range of relevant contexts
- be able to design and test products that are purposeful and appealing
- select tools and materials which are most suitable to make their products from
- evaluate their products against existing products and design criteria
- develop the technical knowledge needed to build structures which are stronger and more stable and be able to use a range of mechanisms
- develop an understanding of where food comes from and how to use the basic principles of a healthy diet to make their own simple dishes

LKS2 - Years 3 & 4

The principal focus of design and technology teaching in LKS2 emphasises a progression from KS1, with children developing more independence in planning, creating, and evaluating their work.

- recall the initial, sticky and procedural knowledge specified within the curriculum depth map
- explore a range of existing products and identify what makes products successful
- create designs from different viewpoints
- consider the influence of existing designs/designers Know a range of tools, their uses and when best to use them
- mark, measure, cut and join accurately
- use sewing, weaving or knitting skills
- evaluate their own and others' products and consider possible improvements.

UKS2 - Years 5 & 6

The principal focus of design and technology teaching in UKS2 aims to develop pupils' technical knowledge alongside their creativity, critical thinking, and practical skills through designing and making products that solve real and relevant problems. By the end of Key Stage 2, pupils will:

- recall the initial, sticky and procedural knowledge specified within the curriculum depth map design and make purposeful and quality products in different contexts
- research how existing products work and use this to develop designs and products to meet a design brief
- produce more detailed, annotated designs and to test and refine their ideas
- select and use a wider range of tools and materials according to their function and properties
- develop the technical knowledge required to make their products work effectively
- evaluate the effectiveness and quality of their products and use this to improve their work
- have an understanding of a healthy and varied diet and be able to prepare and cook a range of dishes

KS3

The transition from KS2 to KS3 emphasises moving from guided experiences with basic tools and processes toward independent application of design, with increased technical precision and critical awareness of wider contexts.

- detailed design specifications, iterative design processes, consideration of user needs and market research
- advanced material properties; complex mechanical systems; electronic systems; computing applications
- selection and skilled use of specialist tools; working with increased accuracy and finish; more complex construction techniques
- analysis of products against specifications; understanding contexts, users and purposes; considering impact on individuals and society
- in-depth understanding of material properties, working characteristics, and appropriate applications
- greater autonomy in project planning and execution; more open-ended briefs; independent problem-solving
- advanced cooking techniques; comprehensive understanding of nutrition principles; food provenance and sustainability

The Foundations for Learning Design and Technology in the Early Years

In the Early Years Foundation Stage (EYFS), Design and Technology isn't a standalone subject but is embedded within various areas of learning. These foundations help young children develop creativity, problem-solving skills, and early engineering concepts. At BHPS, our curriculum aligns the EYFS areas of 'expressive arts and design', 'physical development' and 'understanding the world' with the Design and Technology National Curriculum. In Foundation, children experience a combination of direct teaching and child led exploration to achieve an understanding of key primary themes linked to designing, making and evaluating. Children's interests and curiosities are equally valued and fostered and therefore we have included a continuous provision element to summarise the potential learning that may arise within the environment.

Our EYFS curriculum ensures sufficient coverage of key primary themes of cooking and nutrition, structures, textiles and seasonal projects such as hanging decorations and flower threading. The sticky knowledge is explicitly taught and then embedded through pedagogical approaches appropriate for EYFS including exploration, creating, constructing, modelling and general creativity. Our Foundation unit is a vocabulary rich environment where adults enhance children's language linked to the key primary themes, through a purposeful play-based approach.

Our Foundation curriculum teaches 'The Characteristics of Effective Learning' in a sequential and progressive approach. Our school recognises that this conceptual knowledge provides the foundation for further learning in the subject. It helps pupils build an understanding of the world around them and lays the groundwork for more advanced learning of design and technology and their key primary themes in later education. Teachers are integral to organising children's learning of design and technology, explicitly teaching the connections between components of knowledge, and therefore avoiding misconceptions.

Learning is carefully sequenced, considering the small steps children need to achieve the ELG and considers the interplay between conceptual and procedural knowledge that children need in order to access the National Curriculum. KS1 staff draw upon the 'expressive arts and design', 'physical development' and 'understanding the world' ELG assessment to support future teaching. The ELG assesses only a small proportion of the learning children experience. As KS1 teachers begin topics, they teach and assess initial knowledge that children may have acquired previously.

Foundation	Autumn Term		Spring Term		Summer Term	
	1	**2**	**1**	**2**	**1**	**2**
Topic Title	I wonder… what makes us special and what I can do?	I wonder… where the story will take us?	I wonder…. where I will go? Pirates	I wonder…. what's out there?	I wonder….how living things grow?	I wonder….how other people can help us?
Links to DT key primary themes		**Structures: Junk Modelling**	**Structures: Boats**	**Seasonal Project: Spring**	**Seasonal Project: Summer**	**Cooking and nutrition: Bake and make**
Sticky knowledge		• There are a range of different materials that can be used to make a model and that they are all slightly different. • Know that there are ways to fix their junk model	• 'Waterproof' materials are those which do not absorb water • Some objects float and others sink	• Tearing, scrunching, collage and colour are ways to use create an affect	• Use a range of tools and techniques to create a flower • Patterns can be repeated or random	• A cake is ingredients blended together • Different packaging might be used for different foods • Suitable packaging is important if you are preparing food for others
Design		• Making verbal plans and material choices. • Developing a junk model.	• Designing a junk model boat. • Using knowledge from exploration to inform design	• Use a range of artistic effects to express their ideas and opinions	• Use a range of artistic effects to express their ideas and opinions	• Designing a cake recipe as a class • Designing packaging for the cake
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	• Make a boat that floats and is waterproof, considering material choices	• Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.	• Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.	• Mixing ingredients together • Pouring mixtures in to cake casing

Evaluate		• Giving a verbal evaluation of their own and others' junk models with 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 and evaluating materials to see if they are waterproof. • Making predictions and evaluating existing boats to see which floats best. • Testing their design and reflecting on what could have been done differently. • Investigating how the shapes and structure of a boat affect the way it moves.		• Share product, explaining the process they have used	• Share product explaining the process they have used		• Tasting cakes and giving opinions • Describing some of the following when tasting food: look, feel, smell and taste. • Choosing their favourite packaging design and explaining why.
Link to KS1 Key Primary Themes		Y1 – Structures – Windmill Y2 – Structures – Baby bear's chair		Y1 – Structures – Windmill Y2 – Structures – Baby bear's chair		Y1 – Structures – Windmill Y2 – Structures – Baby bear's chair Y1 –Mechanisms / Mechanical systems – Moving story book/card Y2 Mechanisms / Mechanical systems – Moving monsters	Y1 – Structures – Windmill Y2 – Structures – Baby bear's chair Y1 – Mechanisms / Mechanical systems – Moving story book/card Y2 - Mechanisms / Mechanical systems – Moving monsters		Y1 – Cooking and Nutrition – Smoothies Y2 – Cooking and Nutrition – Balanced diet
Explore and Learn in continuous provision		• Box modelling in workshop area • Den building in outdoor area using pegs, crates and material. • On the workshop table		• Children are given a range of materials in the water trolley to explore floating and sinking.			•		
Vocabulary	**Tier 1**	**Tier 2**	**Tier 3**	**Tier 1**	**Tier 2**	**Tier 3**	**Tier 1**	**Tier 2**	**Tier 3**
	bend cut scissors stick	bend fix join measure materials		junk	absorb colour create design float pattern plan shape sink waterproof		down heat mix pull push stir up	bake ingredients melt over packaging pattern	

Design and Technology Curriculum Depth Map – Progression

Key Cooking and Nutrition Mechanisms Structures Textiles Electrical Systems Seasonal activities/ projects		**Design**	**Make**	**Evaluate**	**Technical Knowledge**
Year	**Components of learning**				
F2	Junk Modelling Hanging Decorations Boats Bake and make Threading flowers	Talk about what they would like to make, how they will do it and what they think about it when it is finished.	Make their own creations using a wide range of different materials, fixings and tools which are freely available in continuous provision.	Evaluate what they have made and make changes as appropriate.	Know how to use tools such as scissors, hole punch, string, sellotape, cutters etc
Year 1	Puppets Moving story book/card Smoothies Windmill	• Draw clearly labelled designs, suggesting which parts of their designs will move and how they will appeal to the intended user • Design packaging and suggest information to be on there.	• Make a picture, which meets the design criteria, with parts that move purposefully as planned. • Make stable structures, which will eventually support the turbine, out of card, tape and glue. • Make functioning turbines and axles that are assembled into the main supporting structure. • Join fabrics together using pins, staples or glue. • Prepare fruits and vegetables to make a smoothie.	• Say what is good about their product and what they could do better. • Taste and evaluate different food combinations.	• Identify whether a mechanism is a side-to-side slider or an up-and-down slider and determine what movement the mechanism will make. • Know that 'joining technique' means connecting two pieces of material together. • Describe fruits and vegetables and explain why they are a fruit or a vegetable • Name a range of places that fruits and vegetables grow.
Year 2	Pouches Baby bear's chair Balanced diet Moving monster	• Design products suitable for a given audience which satisfy a given set of design criteria. • Think of different wrap ideas, considering flavour combinations	• Select and assemble materials to create their products. • Make products that are structurally strong. • Prepare and cut fabric to make a pouch from a template. • Use a running stitch to join the two pieces of fabric together. • Decorate their products using materials provided. • Construct a wrap that meets the design brief and their plan.	• Evaluate their designs against the design criteria, using this information and the feedback of their peers to choose their best design. • Describe the taste, texture and smell of a given food.	• Know the correct terms for levers, linkages and pivots. • Identify man-made and natural structures. • Identify stable and unstable structural shapes. • Name the main food groups and identify foods that belong to each group.

Year 3	Torches Pavilions Pneumatic toys Eating Seasonally	• Carry out research to gain ideas for initial designs. • Design products with key features that satisfy a given purpose. • Design their own tart recipe using seasonal ingredients.	• Select appropriate materials and construction techniques to create a stable, free-standing structure. • Build a complex structure from simple geometric shapes. • Score or cut along lines on the net of a 2D shape. • Assemble a product that includes a functional simple circuit. • Understand the basic rules of food hygiene and safety. • Follow the instructions within a recipe.	• Test their product, identify and correct errors as needed. • Evaluate their work by answering simple questions. • Suggest points for improvement when making a seasonal tart.	• Know what 'information design' is and understand its impact. • Know that a 'free-standing' structure is one that can stand on its own. • Know that fruits and vegetables grow in countries based on their climates. • Know that 'seasonal' fruits and vegetables are those that grow in a given season and taste best then. • Know that eating seasonal fruit and vegetables has a positive effect on the environment.
Year 4	Cross-stitch and applique Electric posters Adapting a recipe Mechanical Cars	• Write their own set of design criteria for a product. • Sketch more than one initial idea. • Design a product that meets design criteria and is aesthetically pleasing. • Plan a recipe within a given budget.	• Make a template for their product. • Choose an appropriate stitch they are comfortable with. • Produce appropriate products where parts are assembled effectively. • Follow a recipe, with some support. • Adapt a recipe by adding extra ingredients to it.	• Conduct a trial accurately and draw conclusions and improvements. • Evaluate the product on the aesthetics and original design criteria. • Evaluate, compare and suggest improvements.	• Know what is meant by 'point of sale display'. • Know the features, benefits and disadvantages of a range of applique types. • Describe some of the features of a biscuit based on taste, smell, texture and appearance. • Know the following cooking techniques: sieving, creaming, rubbing method, cooling.
Year 5	Doodlers Bridges Gears and Pulleys Developing a recipe	• Research key information and test existing products to develop a list of design criteria for a given purpose. • Develop design criteria with consideration for the target user. • Explain simply why their product has a certain configuration. • Design packaging that promotes the ingredients	• Assemble the components necessary for all their structures/mechanisms. • Use a range of mechanisms to make their product interactive. • Make a range of structures using a variety of materials which will enhance their product • Create a functional Doodler that creates scribbles on paper with or without a switch. • Work as a team to amend a recipe with healthy adaptations. • Follow a recipe, ensuring no cross-contamination	• Explain key pros and cons of virtual modelling vs physical modelling. • Evaluate the work of others and receive feedback on their own work. • Evaluate the end meal in terms of nutritional values.	• Know how to use sliders, pivots and folds to create paper-based mechanisms. • Know simple circuit components with a basic explanation of their function. • Know that a series circuit is assembled in a loop to allow the electricity to flow along one path. • Know what monitoring devices are. • Know what a 'healthy meal' means. • Notice the nutritional differences between different products.
Year 6	Come dine with me – WWII rations Blankets Steady hand game Enterprise Project	• Consider a range of factors in their design criteria and use this to create a design. • Create a range of designs, applying the design criteria to their work. • Find a suitable recipe for their course. • Record ingredients and equipment needed.	• Use a running stitch to join fabric to make a functional blanket design. • Attach a secure fastening, and decorative objects. • Follow a recipe, including using the correct quantities of each ingredient. • Write a recipe, explaining the process taken.	• Make suitable changes to their work after peer evaluation. • Evaluate their final product and explain in depth their choices. • Evaluate a recipe, considering: taste, smell, texture and origin of the food group.	• Know that it is important to design clothing with the client in mind. • Explain where certain key foods come from before they appear on the supermarket shelf. • Understand that during periods of history food was rationed to ensure that there was enough food to go around.

Conceptual Knowledge Overview

	Cooking and Nutrition	Mechanisms Mechanical Systems	Structures	Textiles	Electrical Systems	*Digital World
EYFS	✓		✓	✓		
1	✓	✓	✓	✓		
2	✓	✓	✓	✓		
3	✓	✓	✓		✓	✓
4	✓	✓		✓	✓	✓
5	✓	✓	✓		✓	✓
6	✓			✓	✓	✓

* Digital World - Key components of learning delivered through the Teach Computing Curriculum (See computing CDM)

Half Termly Topic Overview per year group

	Autumn Term		Spring Term		Summer Term	
	1	2	1	2	1	2
Foundation	Junk modelling		Boats	Hanging decorations	Bake and make	Threading flowers
Year 1		Puppets		Moving story book/cards	Smoothies	Windmill
Year 2		Pouches		Balanced diet	Baby bear's chair	Moving monster
Year 3		Torches	Pneumatic toys	Pavilions	Eating seasonally	
Year 4	Electric posters	Cross-stitch and appliqué cushions/ Egyptian collars		Adapting a recipe		Mechanical cars
Year 5		Doodlers	Bridges	Gears and pulleys		Developing a recipe
Year 6		Sewing Make do and mend Come Dine with Me - WWII Rations			Steady hand game	Enterprise project

Design and Technology – Key Primary themes by component of learning

YR	Component of Learning	Key Primary Theme	Detail
F2	Bake and make	**Cooking and Nutrition**	'Ingredients' means the items in a mixture
Y1	Smoothies		Handing and exploring fruits and vegetables, learning how to identify fruit
Y2	Balanced Diet		'Diet' means the food and drink that a person usually eats
Y3	Eating Seasonally		Eating seasonal foods can have a positive impact on the environment
Y4	Adapting a recipe		The amount of an ingredient in a recipe is known as the quantity
Y5	Developing a recipe		Recipes can be adapted to suit nutritional needs and dietary requirements
Y6	Come dine with me		'Processed food' means food that has been put through multiple changes in a factory
Y1	Moving story book/card	**Mechanisms/Mechanical Systems**	A mechanism is the parts of an object that move together
Y2	Moving monsters		Mechanisms are a collection of moving parts that work k together as a machine to produce movement
Y3	Pneumatic toys		Pneumatic systems and where they are found in everyday objects e.g. car boot, adjustable chair
Y4	Mechanical Cars		A mechanical system can allow us to move something more easily
Y5	Gears and pulleys		Gears and pulleys allow you to transfer movement and force from one part of a mechanical system to another
F2	Junk Modelling	**Structures**	Develop fine motor skills and awareness of different materials and joining techniques
	Boats		
Y1	Windmill		Understand different types of windmills, how they work and their key features
Y2	Baby Bear's Chair		Natural structures are found in nature, whilst man-made structures are those made by people
Y3	Pavilions		A pavilion is a decorative building or structure for leisure activities
Y5	Bridges		There is a difference between arch, beam, truss and suspension bridges
F2	Bookmarks	**Textiles**	A design is a way of planning out ideas before you start
Y1	Puppets		A template (or fabric pattern) is used to cut out the same shape multiple times
Y2	Pouches		Different stitches can be used when sewing
Y4	Cross-stitch and appliqué Cushions/ Egyptian collars		Applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces
Y6	Blankets		It is important to design clothing with the client/ target customer in mind
Y3	Torches	**Electrical Systems**	A switch can be used to complete and break an electrical circuit
Y4	Electric posters		Understand the importance and purpose of information design
Y5	Doodlers		An electric motor converts electrical energy into rotational movement, causing the motor's axle to spin
Y6	Steady hand game		'Fit for purpose' means that a product works how it should and is easy to use
F2	Hanging Decorations	**Seasonal Activities/Projects**	Develop fine motor skills and awareness of different materials and joining techniques
	Threading Flowers		
Y6	Enterprise Project		The Enterprise Project is an opportunity to run a small business by designing, marketing and producing a product that can be sold to an intended audience

Appendix – Key Knowledge and Vocabulary

Tier 1	Tier 2	Tier 3
Basic vocabulary *To be used but require little or no explicit instruction.*	***Academic vocabulary*** *To be taught and assessed. Words that could be used across disciplines.*	**Context Specific** *Specific vocab that will normally relate to one subject – to be taught and assessed*

Design and Technology	**Foundation**		
Key Knowledge	**Key Vocabulary**		
Topic – I wonder….where the story will take us?	**Tier 1**	**Tier 2**	**Tier 3**
Links to component of learning: Junk Modelling **Structures - Develop fine motor skills and awareness of different materials and joining techniques**	cut scissors stick	bend fix join measure materials	
Link to KS1 Key primary themes **Y1 – Structures – Windmill** **Y2 – Structures – Baby bear's chair**			
Sticky knowledge: taught & assessed for end goal. ❑ There are a range of different materials that can be used to make a model and that they are all slightly different. ❑ Know that there are ways to fix their junk model			
Design • Making verbal plans and material choices. • Developing a junk model.			
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			
Evaluate • Giving a verbal evaluation of their own and others' junk models with 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.			
Explore and learn in continuous provision. ❑			

Topic – I wonder…where I will go (pirates)	**Tier 1**	**Tier 2**	**Tier 3**
Links to component of learning: Boats **Structures - Develop fine motor skills and awareness of different materials and joining techniques**	junk	absorb float sink waterproof	
Link to KS1 Key primary themes Y1 – Structures – Windmill Y2 – Structures – Baby bear's chair			
Sticky knowledge: taught & assessed for end goal. ❑ 'Waterproof' materials are those which do not absorb water ❑ Some objects float and others sink			
Design • Designing a junk model boat. • Using knowledge from exploration to inform design			
Make Make a boat that floats and is waterproof, considering material choices			
Evaluate • Making predictions and evaluating materials to see if they are waterproof. • Making predictions and evaluating existing boats to see which floats best. • Testing their design and reflecting on what could have been done differently. • Investigating how the shapes and structure of a boat affect the way it moves.			
Explore and learn in continuous provision. ❑			

Topic – I wonder…..what's out there?	**Tier 1**	**Tier 2**	**Tier 3**
Links to component of learning: Hanging decorations **Seasonal Activity - Develop fine motor skills and awareness of different materials and joining techniques**		design plan create colour shape pattern	
Link to KS1 Key Primary Themes Y1 – Structures – Windmill Y2 – Structures – Baby bear's chair Y1 – Mechanisms/Mechanical systems – Moving story book/card Y2 - Mechanisms/Mechanical systems – Moving monsters			
Sticky knowledge: taught & assessed for end goal. ❑ Tearing, scrunching, collage and colour are ways to use create an affect ❑ Know how to join their chosen material to their egg and explain why this is the best way			
Design • Use a range of artistic effects to express their ideas and opinions			
Make • Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.			
Evaluate • Share product, explaining the process they have used			
Explore and learn in continuous provision. ❑			

Topic – I wonder….how living things grow?	**Tier 1**	**Tier 2**	**Tier 3**
Links to component of learning: Threading flowers **Seasonal Activity - Develop fine motor skills and awareness of different materials and joining techniques**	down pull push up	over pattern pinch punch thread through under	
Link to KS1 Key Primary Themes Y1 – Structures – Windmill Y2 – Structures – Baby bear's chair Y1 – Mechanisms/Mechanical systems – Moving story book/card Y2 - Mechanisms/Mechanical systems – Moving monsters			
Sticky knowledge: taught & assessed for end goal. ❑ Use a range of tools and techniques to create a threaded flower ❑ Patterns can be repeated or random			
Design • Use a range of artistic effects to express their ideas and opinions			
Make • Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.			
Evaluate • Share product explaining the process they have used			
Explore and learn in continuous provision. ❑			

Topic – I wonder….how other people can help us?	**Tier 1**	**Tier 2**	**Tier 3**
Links to component of learning: Bake and make **Ingredients' means the items in a mixture**	heat mix stir	bake ingredients melt packaging	
Link to KS1 Key Primary Themes Y1 – Cooking and Nutrition – Smoothies Y2 – Cooking and Nutrition – Balanced diet			
Sticky knowledge: taught & assessed for end goal. ❑ A cake is ingredients blended together ❑ Different packaging might be used for different foods ❑ Suitable packaging is important if you are preparing food for others			
Design • Designing a cake recipe as a class • Designing packaging for the cake			
Make • Mixing ingredients together • Pouring mixtures in to cake casing			
Evaluate • Tasting cakes and giving opinions • Describing some of the following when tasting food: look, feel, smell and taste. • Choosing their favourite packaging design and explaining why.			
Explore and learn in continuous provision. ❑			

Tier 1	Tier 2	Tier 3
Basic vocabulary *To be used but require little or no explicit instruction.*	***Academic vocabulary*** *To be taught and assessed. Words that could be used across disciplines.*	**Context Specific** *Specific vocab that will normally relate to one subject – to be taught and assessed*

Design and Technology – KS1	**Year 1**		
Key Knowledge	**Key Vocabulary**		
Component of learning: Puppets	**Tier 1**	**Tier 2**	**Tier 3**
Key primary theme: Textiles A template (or fabric pattern) is used to cut out the same shape multiple times	glue hand puppet	design decorate fabric template	
Initial knowledge ❑ There are various temporary methods of joining fabric by using staples. glue or pins. ❑ Different techniques for joining materials can be used for different purposes.			
Sticky knowledge to be taught and assessed for end goal. ❑ 'Joining technique' means connecting two pieces of material together. ❑ A template (or fabric pattern) is used to cut out the same shape multiple times. ❑ Drawing a design idea is useful to see how an idea will look.			
Design • Using a template to create a design for a puppet.			
Make • Cutting fabric neatly with scissors. • Using joining methods to decorate a puppet. • Sequencing steps for construction.			
Evaluate • Reflecting on a finished product, explaining likes and dislikes.			

Component of learning: Moving story book/cards	**Tier 1**	**Tier 2**	**Tier 3**
Key primary theme: Mechanisms/Mechanical Systems A mechanism is the parts of an object that move together	test	assemble design evaluation mechanism model slider stencil target audience	
Initial knowledge ❑ In design and technology we call a plan a 'design' ❑ A mechanism is the parts of an object that move together			
Sticky knowledge to be taught and assessed for end goal. ❑ A slider mechanism moves an object from side to side. ❑ A slider mechanism has a slider, slots , guides and an object. ❑ Bridges and guides are bits of card that purposefully restrict the movement of the slider**.**			
Design • Explaining how to adapt mechanisms, using bridges or guides to control the movement. • Designing a moving story book for a given audience.			
Make • Following a design to create moving models that use levers and sliders			
Evaluate • 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			

Component of learning: Smoothies	Tier 1	Tier 2	Tier 3
Key primary theme: Cooking and Nutrition Handing and exploring fruits and vegetables, learning how to identify fruit	blend flavour fruit juice taste	healthy ingredients recipe smoothie	
Initial knowledge ❑ A blender is a machine which mixes ingredients together into a smooth liquid ❑ Fruit grows on trees or vines			
Sticky knowledge to be taught and assessed for end goal. ❑ Fruit has seeds and a vegetable does not ❑ Vegetables can grow either above or below ground ❑ Vegetable refers to any edible part of a plant			
Design • Design smoothie carton packaging by-hand • Learn where and how fruits and vegetables grow and apply this knowledge to smoothie designs			
Make • Chop fruit and vegetables safely to make a smoothie • Juicing fruits safely to make a smoothie • Identify if a food is a fruit			
Evaluate • Taste and evaluate different food combinations • Describe appearance, smell and taste • Suggest information to be included on packaging • Compare own smoothie to those made by someone else			

Component of learning: Windmill	Tier 1	Tier 2	Tier 3
Key primary theme: Structures Understand different types of windmills, how they work and their key features	sails same strong weak wind windmill	base centre design equal evaluate middle rotate rotor rotor blades stable structure test	
Initial knowledge ❑ Different structures are used for different purposes. ❑ A structure is something that has been made and put together and is built for a reason ❑ Sails or blades of a windmill are moved by the wind. ❑ Stable structures do not topple over			
Sticky knowledge to be taught and assessed for end goal. ❑ Cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses). ❑ Axles are used in structures and mechanisms to make parts turn in a circle. ❑ Adding weight to the base of a structure can make it more stable			
Design • Understand the importance of a clear design criteria • Include individual preferences and requirements in a design			
Make • Make stable structures from card. • Follow instructions to cut and assemble the supporting structure of a windmill. • Make functioning turbines and axles which are assembled into a main supporting structure. • Find the middle of an object. • Puncture holes. • Add weight to structures. • Create supporting structures. • Cut evenly and carefully.			
Evaluate • Evaluate according to the design criteria, testing whether the structure is strong and stable and altering it if it is not. • Suggest ways the design can be improved			

Tier 1	Tier 2	Tier 3
Basic vocabulary *To be used but require little or no explicit instruction.*	***Academic vocabulary*** *To be taught and assessed. Words that could be used across disciplines.*	**Context Specific** *Specific vocab that will normally relate to one subject – to be taught and assessed*

Design and Technology – KS1	**Year 2**		
Key Knowledge	**Key Vocabulary**		
Component of learning: Pouches	**Tier 1**	**Tier 2**	**Tier 3**
Key primary theme: Textiles Different stitches can be used when sewing	knot sew shape	accurate fabric pouch running-stitch stencil template thimble	
Initial knowledge ❑ Sewing is a method of joining fabric ❑ Different stitches can be used when sewing.			
Sticky knowledge to be taught and assessed for end goal. ❑ Tying a knot after sewing the final stitch is important to ensure that your sewing and product do not fall apart ❑ Running stitch is the basic stitch in hand sewing. ❑ The smaller the stitches, the stronger the sewing. ❑ A thimble can be used to protect fingers when sewing			
Design • Design a pouch for a given purpose			
Make • Select and cut fabrics for sewing. • Decorate a pouch using fabric glue or running stitch. • Thread a needle. • Sew running stitch, with evenly spaced, neat, even stitches to join fabric. • Neatly pin and cut fabric using a template.			
Evaluate • Troubleshoot scenarios posed by teacher. • Evaluate the quality of the stitching on others' work. • Discuss as a class, the success of their stitching against the success criteria. • Identify aspects of their peers' work that they particularly like and why.			

Component of learning: Baby bear's chair	**Tier 1**	**Tier 2**	**Tier 3**
Key primary theme: Structures Natural structures are found in nature, whilst man-made structures are those made by people	strong weak	function man-made mould natural stable stiff strong structure test	
Initial knowledge ❑ Natural structures are those found in nature. ❑ Man-made structures are those made by people. ❑ The shape of a structure affects its strength. ❑ A structure is something which has been formed or made from parts.			
Sticky knowledge to be taught and assessed for end goal. ❑ Shapes and structures with wide, flat bases or legs are the most stable. ❑ Materials can be manipulated to improve strength and stiffness. ❑ Structures can be describe in a number of ways: 'Stable' - firmly fixed and unlikely to change or move. 'Strong' - does not break easily. 'stiff' - does not bend easily.			
Design • Generate and communicate ideas using sketching and modelling • Apply knowledge of different types of structures to design ideas			
Make • Make a structure according to design criteria • Create joints and structures from paper/card and tape. • Build a strong and stiff structure by folding paper.			
Evaluate • Explore the features of structures. • Compare the stability of different shapes. • Test the strength of own structures. • Identify the weakest part of a structure. • Evaluate the strength, stiffness and stability of own structure			

Component of learning: Balanced Diet	Tier 1	Tier 2	Tier 3
Key primary theme: Cooking and Nutrition 'Diet' means the food and drink that a person usually eats		appearance balanced carbohydrates combination dairy diet oils protein spread	
Initial knowledge ❑ 'Diet' means the food and drink that a person or animal usually eats ❑ 'ingredients' means the items in a mixture or recipe			
Sticky knowledge to be taught and assessed for end goal. ❑ There are five main food groups: carbohydrates, fruit and vegetables, protein, dairy and foods high in fat and sugar. ❑ For a diet to be balanced it should have a range of different food groups included			
Design • Design three wrap ideas to fit with the balanced diet food groups			
Make • Chopp foods safely to make a wrap. • Construct a wrap that meets a design brief. • Grate foods to make a wrap. • Snip smaller foods instead of cutting. • Spread soft foods to make a wrap. • Identify the five food groups.			
Evaluate • Describing appearance, smell and taste. • Taste and evaluate different food combinations. • Describe the information that should be included on a label.			

Component of learning: Moving monster	Tier 1	Tier 2	Tier 3
Key primary theme: Mechanisms/Mechanical Systems Mechanisms are a collection of moving parts that work k together as a machine to produce movement		evaluation input lever linear motion linkage mechanical mechanism motion output pivot rotary motion survey	
Initial knowledge ❑ Mechanisms are a collection of moving parts that work together as a machine to produce movement. ❑ There is always an input and output in a mechanism			
Sticky knowledge to be taught and assessed for end goal. ❑ There is always an input and output in a mechanism. ❑ An input is the energy that is used to start something working. ❑ An output is the movement that happens as a result of the input. ❑ A lever is something that turns on a pivot. ❑ A linkage mechanism is made up of a series of levers.			
Design • Create a class design criteria for a moving monster. • Designing a moving monster for a specific audience in accordance with a design criteria			
Make • 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			
Evaluate • Evaluate own designs against design criteria • Use peer feedback to modify a final design			

Tier 1	Tier 2	Tier 3
Basic vocabulary *To be used but require little or no explicit instruction.*	***Academic vocabulary*** *To be taught and assessed. Words that could be used across disciplines.*	**Context Specific** *Specific vocab that will normally relate to one subject – to be taught and assessed*

Design and Technology – KS2	**Year 3**		
Key Knowledge	**Key Vocabulary**		
Component of learning: Torches	**Tier 1**	**Tier 2**	**Tier 3**
Key primary theme: Electrical Systems A switch can be used to complete and break an electrical circuit	switch torch wire	battery bulb buzzer cell circuit component conductor electrical function insulator series circuit	
Initial knowledge ❑ The invention of the electric light bulb(s) by Sir Joseph Swan and Thomas Edison ❑ A torch has a number of features: case, contacts, batteries, switch, reflector, lamp, lens			
Sticky knowledge to be taught and assessed for end goal. ❑ Electrical conductors are materials which electricity can pass through. ❑ Electrical insulators are materials which electricity cannot pass through. ❑ A battery contains stored electricity that can be used to power products. ❑ An electrical circuit must be complete for electricity to flow. ❑ A switch can be used to complete and break an electrical circuit.			
Design • Design a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas			
Make • Make a torch with a working electrical circuit and switch. • Use appropriate equipment to cut and attach materials. • Assemble a torch according to the design and success criteria			
Evaluate • Evaluate electrical products • Test and evaluate the success of a final product			

Component of learning: Pavilions	**Tier 1**	**Tier 2**	**Tier 3**
Key primary theme: Structures A pavilion is a decorative building or structure for leisure activities	structure texture theme	cladding design criteria evaluation frame - structure function inspiration pavilion stable	
Initial knowledge ❑ Aesthetics are how a product looks. ❑ A product's function means its purpose ❑ A 'free-standing' structure is one which can stand on its own			
Sticky knowledge to be taught and assessed for end goal. ❑ A pavilion is a decorative building or structure for leisure activities. ❑ Cladding can be applied to structures for different effects ❑ The target audience means the person or group of people a product is designed for. ❑ Architects consider light, shadow and patterns when designing			
Design • Design a stable pavilion structure that is aesthetically pleasing and select materials to create a desired effect. • Build frame structures designed to support weight.			
Make • Create a range of different shaped frame structures. • Make a variety of free-standing frame structures of different shapes and sizes. • Select appropriate materials to build a strong structure and cladding. • Reinforce corners to strengthen a structure. • Create a design in accordance with a plan. • Learn to create different textural effects with materials			
Evaluate • Evaluate structures made by the class. • Describe what characteristics of a design and construction made it the most effective. • Consider how effective and ineffective the design is			

Component of learning: Pneumatic Toy	Tier 1	Tier 2	Tier 3
Key primary theme: Mechanisms/Mechanical Systems Pneumatic systems and where they are found in everyday objects e.g. car boot, adjustable chair	housing	diagram evaluate feedback housing linkage mechanism mechanical system pivot pneumatic system thumbnail sketch	
Initial knowledge ❑ exploded diagrams are used to show how different parts of a product fit together ❑ thumbnail sketches are small drawings to get ideas down on paper quickly ❑ sketches, drawings and diagrams can be used to communicate design ideas			
Sticky knowledge to be taught and assessed for end goal. ❑ understand how pneumatic systems work. ❑ pneumatic systems can be used as part of a mechanism. ❑ pneumatic systems operate by drawing in, releasing and compressing air.			
Design • Designing a toy which uses a pneumatic system. • Developing design criteria from a design brief. • Generating ideas using thumbnail sketches and exploded diagrams. • Learning that different types of drawings are used in design to explain ideas clearly.			
Make • Creating a pneumatic system to create a desired motion. • Building secure housing for a pneumatic system. • Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy. • Selecting materials due to their functional and aesthetic characteristics. • Manipulating materials to create different effects by cutting, creasing, folding and weaving.			
Evaluate • 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			

Component of learning: Eating seasonally	Tier 1	Tier 2	Tier 3
Key primary theme: Cooking and Nutrition Eating seasonal foods can have a positive impact on the environment		arid climate country export import mediterranean seasonal seasons texture temperature	
Initial knowledge ❑ Understand that the appearance of food is as important as taste			
Sticky knowledge to be taught and assessed for end goal. ❑ Seasonal means foods that grow in a given season in a given country ❑ Eating seasonal foods can have a positive impact on the environment ❑ Similar coloured fruits and vegetables often have similar nutritional benefits. ❑ Know some seasonal foods that grow in the UK and what season they grow in			
Design • Explain when planning, how climate affects where foods grow			
Make • Identify seasonal ingredients from the UK. • Follow instructions within a recipe. • Taste seasonal ingredients. • Peel foods by hand or with a peeler. • Cut ingredients safely. • Choose ingredients based on a design brief			
Evaluate • Describe the texture and flavour of ingredients • Describe the benefits of seasonal fruits and vegetables and the impact on the environment			

Tier 1	Tier 2	Tier 3
Basic vocabulary *To be used but require little or no explicit instruction.*	***Academic vocabulary*** *To be taught and assessed. Words that could be used across disciplines.*	**Context Specific** *Specific vocab that will normally relate to one subject – to be taught and assessed*

Design and Technology – KS2	**Year 4**		
Key Knowledge	**Key Vocabulary**		
Component of learning: Cross-stitch and appliqué Cushions/ Egyptian collars	**Tier 1**	**Tier 2**	**Tier 3**
Key primary theme: Textiles Applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces	cushion	applique cross-stitch decorate detail fabric patch running-stitch seam stencil stuffing	
Initial knowledge ❑ Two edges of fabric joined together is called a seam. ❑ It is important to leave space on the fabric for the seam.			
Sticky knowledge to be taught and assessed for end goal. ❑ Applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces. ❑ Some products are turned inside out after sewing so the stitching is hidden.			
Design • Design and make a template from an existing cushion and apply individual design criteria			
Make • Follow design criteria to create a cushion or Egyptian collar. • Select and cut fabrics with ease using fabric scissors. • Thread needles with greater independence. • Tie knots with greater independence. • Sew cross stitch to join fabric. • Decorate fabric using appliqué. • Completing design ideas with stuffing and sewing the edges (Cushions) or embellishing the collars based on design ideas (Egyptian collars).			
Evaluate • Evaluate a product and think of other ways in which to create similar items			

Component of learning: Electric Posters	**Tier 1**	**Tier 2**	**Tier 3**
Key primary theme: Electrical Systems Understand the importance and purpose of information design	initial ideas final design peer - assessment research self - assessment sketch	battery bulb circuit circuit component crocodile wires electrical product electrical system information design	
Initial knowledge ❑ The design of a poster is important to make sure that the purpose and information shared is effective ❑ The material choices can improve a product to serve its purpose ❑ There are common electric products e.g. kettle, remote control etc			
Sticky knowledge to be taught and assessed for end goal. ❑ An electrical product uses an electrical system to work (function) ❑ An electrical system is a group of parts (components) that work together to transport electricity around a circuit. ❑ There are common features of an electric product (switch, battery or plug, dials, buttons etc.).			
Design • Carry out research based to develop a range of initial ideas. • Generate a final design for the electric poster with consideration to the client's needs and design criteria. • Design an electric poster that fits the requirements of a given brief. • Plan the positioning of the bulb (circuit component) and its purpose.			
Make • Create a final design for the electric poster. • Mount the poster onto corrugated card to improve its strength and allow it to withstand the weight of the circuit on the rear. • Measure and mark materials out using a template or ruler. • Fit an electrical component (bulb). • Learn ways to give the final product a higher quality finish (e.g. framing to conceal a roughly cut edge).			
Evaluate • Give and accept constructive criticism on own work and the work of others. • Test the success of initial ideas against the design criteria and justify opinions. • Revisit the requirements of the client to review develop design ideas and check that they fulfil their needs.			

Component of learning: Adapting a recipe	Tier 1	Tier 2	Tier 3
Key primary theme: Cooking and Nutrition The amount of an ingredient in a recipe is known as the quantity	bake balanced	budget combine fold hygiene modify proving	
Initial knowledge ❑ Safety and hygiene are important when cooking ❑ Products often have a target audience			
Sticky knowledge to be taught and assessed for end goal. ❑ The amount of an ingredient in a recipe is known as the quantity ❑ There are many techniques that can be used in cooking, these include: sieving, measuring, stirring, cutting out and shaping ❑ Budgeting whilst planning ingredients for a recipe is an important part of the planning stage			
Design • Design a biscuit within a given budget • Conduct market research			
Make • Follow a baking recipe • Understand safety and hygiene rules • Adapt a recipe			
Evaluate • Evaluate an adapted recipe, comparing a range of products • Identify modifications			

Component of learning: Mechanical Cars	Tier 1	Tier 2	Tier 3
Key primary theme: Mechanisms/Mechanical Systems A mechanical system can allow us to move something more easily	force machine	bearing chassis mechanism prototype target audience	
Initial knowledge ❑ A prototype is a detailed model that helps a user understand how a product will work ❑ Choices of materials and equipment can affect the final product. ❑ Feedback is ideas and suggestions from other people that can help improve their work			
Sticky knowledge to be taught and assessed for end goal. ❑ A mechanical system can allow us to move something more easily. ❑ Mechanical systems have more than one mechanism that moves to make them work. ❑ Mechanical systems are often hidden in products to make them look more appealing			
Design • Develop drawing and sketching skills with a focus on clarity and simplicity. • Recognise the benefit of a range of diagram types or prototypes to communicate ideas. • Create prototypes using materials with similar properties to final design. • Develop designs, adding detail and justifications about materials, tools, methods.			
Make • Use a ruler as a measuring tool with increasing accuracy by creating spaced marks using millimetres and measuring lengths of objects. • Handle different sizes and types of scissors with confidence. • With close supervision use a hot glue gun to join wooden materials • Select equipment required for a series of tasks based on the plan. • Explain why each piece is suitable for each stage			
Evaluate • Reflect on feedback to decide if and how it could be used to improve design • Investigate and analyse a range of existing products by looking at their functionality and appeal. • Analyse why specific products, designers or inventors are successful. • Evaluate designs by comparing them against design criteria • Consider feedback from peers to suggest improvements. • Evaluate how effective their chosen materials and tools were in fulfilling the design brief.			

Tier 1	Tier 2	Tier 3
Basic vocabulary *To be used but require little or no explicit instruction.*	***Academic vocabulary*** *To be taught and assessed. Words that could be used across disciplines.*	**Context Specific** *Specific vocab that will normally relate to one subject – to be taught and assessed*

Design and Technology – KS2	**Year 5**		
Key Knowledge	**Key Vocabulary**		
Component of learning: Doodler	**Tier 1**	**Tier 2**	**Tier 3**
Key primary theme: Electrical Systems An electric motor converts electrical energy into rotational movement, causing the motor's axle to spin	problem solve	circuit component configuration current motorised product analysis series circuit	
Initial knowledge ❑ Product analysis is critiquing the strengths and weaknesses of a product ❑ When there is a break in a series circuit, all components turn off			
Sticky knowledge to be taught and assessed for end goal. ❑ 'Configuration' refers to how the parts of a product are arranged ❑ Series circuits only have one direction for the electricity to flow. ❑ An electric motor converts electrical energy into rotational movement, causing the motor's axle to spin. ❑ A motorised product is one which uses a motor to function.			
Design • Identify factors that could be changed on existing products and explain how these would alter the form and function of the product. • Develop design criteria based on findings from investigating existing products. • Develop design criteria that clarifies the target user.			
Make • Alter a product's form and function by tinkering with its configuration. • Make a functional series circuit, incorporating a motor. • Construct a product with consideration for the design criteria. • Break down the construction process into steps so that others can make the product			
Evaluate • Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses. • Determine which parts of a product affect its function and which parts affect its form. • Analyse whether changes in configuration positively or negatively affect an existing product. • Peer evaluating a set of instructions to build a product.			

Component of learning: Bridges	**Tier 1**	**Tier 2**	**Tier 3**
Key primary theme: Structures There is a difference between arch, beam, truss and suspension bridges		arch bridge beam bridge predict reinforce suspension bridge truss bridge	
Initial knowledge ❑ Properties are words that describe the form and function of Materials • Material selection is important based on properties			
Sticky knowledge to be taught and assessed for end goal. ❑ There are different ways to reinforce structures, for example triangles can be used to reinforce bridges ❑ Arch, beam, truss and suspension are all different types of bridges ❑ Equipment, such as saws should be carried and used safely			
Design • Design a stable structure that is able to support weight • Create a frame structure with a focus on triangulation			
Make • Make a range of different shaped beam bridges. • Create truss bridges that span a given distance and support a load. • Build a wooden bridge structure. • Measure and mark equipment for particular tasks. • Identify where a structure needs reinforcement and using card corners for support. • Understand basic wood functional properties.			
Evaluate • Adapt and improve own bridge structure by identifying points of weakness and reinforcing them as necessary • Suggest points for improvement for own bridges and those designed by others			

Component of learning: Gears and pulleys	Tier 1	Tier 2	Tier 3
Key primary theme: Mechanisms/Mechanical Systems **Gears and pulleys allow you to transfer movement and force from one part of a mechanical system to another**		annotate gear input market research output pulley pulley system sustainability	
Initial knowledge ❑ Market research is a way of collecting information about problems or needs ❑ Original and innovative ideas are different to what has been made before. ❑ Annotations are detailed labels and comments on diagrams.			
Sticky knowledge to be taught and assessed for end goal. ❑ Mechanical systems that use gears in everyday objects (eg bicycle, clock). ❑ Gears and pulleys allow us to transfer movement and force from one part of a mechanical system to another. ❑ Gears allow us to increase the output of a mechanism. ❑ Explaining how feedback has been used to improve a design can help create better products in the future			
Design • Create more complex design criteria, considering detailed user needs, environmental impact, materials and cost • Broader range of ideas and deeper innovation, requiring critical thinking about their ideas practicality and originality • Use more complex annotated sketches, such as cross-sectional and exploded diagrams and patterns in designs • Use a series of prototypes to refine and improve designs			
Make • Consistently apply safety instructions. • Select appropriate scissors to handle delicate cutting tasks and challenging materials. • Cut patterns and drawings accurately. • In supervised groups, using hot glue guns safely. • Recognise that hot glue is useful for joining materials that need a strong bond that sets quickly. • Choose PVA glue over hot glue for its safety when joining materials in less intensive projects.			
Evaluate • Reflect on the usability, aesthetics, innovation and sustainability of products and discussing how design choices impact these aspects. • Assess their designs against a more complex set of design criteria that includes functionality, aesthetics, user experience, sustainability and cost. • Consider alternative materials, tools or techniques that could enhance the product. • Provide feedback that is helpful, specific, and encouraging. • Incorporate feedback from peers or users improve their product further, explaining the changes they made and the impact they had			

Component of learning: Developing a recipe	Tier 1	Tier 2	Tier 3
Key primary theme: Cooking and Nutrition Recipes can be adapted to suit nutritional needs and dietary requirements	balanced cook	adaptation cross-contamination ingredients measure nutrient nutrition nutritional value preference press process safety	
Initial knowledge – ❑ Nutritional information is found on food packaging ❑ Coloured chopping boards can prevent cross-contamination.			
Sticky knowledge to be taught and assessed for end goal. ❑ Recipes can be adapted to suit nutritional needs and dietary requirements ❑ Food packaging serves many purposes such as promoting the product but also providing information about it			
Design • Research existing recipes. • Suggest alternative ingredients. • Design a jar label.			
Make • Write an alternative recipe • Understand and avoid cross-contamination • Use safe and appropriate preparation skills • Make a developed recipe			
Evaluate • Review finished product • Analyse nutritional content			

Tier 1	Tier 2	Tier 3
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Design and Technology – KS2	**Year 6**		
Key Knowledge	**Key Vocabulary**		
Component of learning: Come dine with me (WWII rations)	**Tier 1**	**Tier 2**	**Tier 3**
Key primary theme: Cooking and Nutrition 'Processed food' means food that has been put through multiple changes in a factory		rationing cookbook preparation ration book cuisine staple food	
Initial knowledge – ❑ It is important to wash fruit and vegetables before eating to remove any dirt and insecticides ❑ 'Flavour' is how a food or drink tastes			
Sticky knowledge to be taught and assessed for end goal. ❑ Rationing was first introduced in January 1940 to ensure the fair distribution of limited food supplies ❑ Each person received a ration book with coupons for different food. ❑ The "Waste Not, Want Not" mentality shaped a generation's relationship with food ❑ 'Processed food' means food that has been put through multiple ❑ changes in a factory.			
Design • Write and follow a recipe, explaining the key steps, method and ingredients. • Include facts and drawings from research undertaken**.**			
Make • Follow a recipe, including using the correct quantities of each ingredient. • Adapt a recipe based on research. • Work to a given timescale. • Work safely and hygienically with independence.			
Evaluate • Evaluate a recipe, considering taste, smell, texture and origin of the food group. • Taste test and score a final product. • Suggest and write up points of improvements in productions • Evaluate health and safety in production to minimise cross contamination			

Component of learning: Blankets	**Tier 1**	**Tier 2**	**Tier 3**
Key primary theme: Textiles It is important to design clothing with the client/ target customer in mind	detail knot shape	annotate design criteria fabric fastening thread seam sew unique	
Initial knowledge ❑ Using a template (or clothing pattern) helps to accurately mark out a design on fabric.			
Sticky knowledge to be taught and assessed for end goal. ❑ Understand that it is important to design products with the client/ target audience in mind. ❑ Consistently sized stitches are important to the ensure the product is fit for purpose.			
Design • Design a blanket in accordance with specifications linked to a set design criteria • Annotate designs to explain design choice.			
Make • Use a template when cutting fabric to ensure they achieve the correct shape. • Use pins to secure a template to fabric without creases or bulges. • Mark and cut fabric accurately, in accordance with their design. • Sew a strong running stitch, making small, neat stitches and following the edge. • Tie strong knots. • Decorate a blanket, attaching features (such as appliqué) using thread. • Finish the blanket with a secure fastening (such as buttons). • Apply different decorative stitches. • Sew accurately with evenly spaced, neat stitches			
Evaluate • Reflect on work continually throughout the design, make and evaluate proves against the product purpose			

Component of learning: Steady hand game	Tier 1	Tier 2	Tier 3
Key primary theme: Electrical Systems 'Fit for purpose' means that a product works how it should and is easy to use		assemble battery bulb buzzer circuit circuit symbol component conductor fit for purpose form function insulator LED perspective user	
Initial knowledge ❑ 'Fit for purpose' means that a product works how it should and is easy to use ❑ 'Form' means the shape and appearance of an object			
Sticky knowledge to be taught and assessed for end goal. ❑ Batteries contain acid, which can be dangerous if they leak. ❑ A basic series circuit has component names, including a buzzer ❑ Form over purpose means that a product looks good but does not work very well. ❑ 'Form follows function' when designing means that the product must be designed primarily with the function in mind. ❑ A diagram can have different perspectives 'top view', 'side view' and 'back'			
Design • Design a steady hand game - identifying and naming the components required. • Draw a design from three different perspectives. • Generate ideas through sketching and discussion. • Model ideas through prototypes. • Understand the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'.			
Make • Construct a stable base for a game. • Accurately cut, fold and assemble a net. • Decorate the base of the game to a high-quality finish. • Make and test a circuit. • Incorporate a circuit into a base.			
Evaluate • Test own and others finished games, identifying what went well and making suggestions for improvement. • Gather images and information about existing children's toys. • Analyse a selection of existing children's toys.			

Component of learning: Enterprise Project	Tier 1	Tier 2	Tier 3
Key primary theme: Project The Enterprise Project is an opportunity to run a small business by designing, marketing and producing a product that can be sold to an intended audience		budget entrepreneur evaluation innovation market research marketing profit prototype sustainability	
Initial knowledge – ❑ When working on a project it is important to work collaborative as a team, to manage time and meet deadlines			
Sticky knowledge to be taught and assessed for end goal. ❑ A budget is a financial plan that shows how much money to expect to earn (income) and how much you expect to spend (expenses) over a period of time. ❑ A production line is an organised system where a product is assembled or created by moving from one workstation to another in a sequential order. ❑ Each station is responsible for completing a specific task or adding a particular component to the product before passing it along to the next station.			
Design • Design a product to sell at the Summer Fayre. • Create a costed list of materials that you be needed, ensuring that there isn't an overspend on the budget. • Marketing – to raise the profile of the product, create a small marketing campaign, comprised of a poster and an iMovie. • Marketed products to be shared with an intended audience • The aim of this project is to make a profit. During the process above, Consider the following questions: Will our intended audience want to buy this product? Can our group make this product to a good quality? Are the materials we need within our budget? If not, can we source them elsewhere?			
Make • Work reciprocally to produce a product. • The more products made, the more products that can be sold. • Whilst quantity is important, be careful not to compromise on the quality of each product. Customers will not buy something that has been poorly produced • Use an assembly line to make your products. This approach, invented by Henry Ford, is a proven way of producing things efficiently. • We all have different strengths and you should use these to your advantage. Carry out a role on the assembly line that you know you will do well. • We all make mistakes and you might find one or two products can't be sold as a result. Be mindful not to waste too much as this will affect your profit			
Evaluate • There are several different aspects beyond financial results that could be evaluated, including: - being able to explain the process of product development, marketing and sales - was the produce well-designed and fit for purpose? - was the quality consistent across production? - did the product meet the needs of the targeted audience? - what feedback was received?			