T Progression Document (Pembroke Park)

"Creativity is inventing, experimenting, growing, taking risk, breaking rules, making mistakes and having fun." - Mary Lou Cook

How is this subject taught and why? **DT** is taught weekly and alternates termly with Art in order to ensure a balanced coverage of the National Curriculum. Weekly teaching allows the children to scaffold their learning by using prior knowledge to support their growth both mentally and practically. The combination of both discussion, research, experimentation, practical application and evaluation allows the children to retain prior learning over time. The final unit of DT will be covered in a summer term "DT week" to ensure a balanced coverage of the four key areas of DT. In Year 5 and 6, because of a lack of prior learning the digital units will be taught at a lower level until the knowledge base has been increased to allow access over the next two years.

Rationale for using a "scheme of learning":

All units must follow a structure that is Design (including current item comparison), Make (steps/instructions, photo evidence), Evaluate.

We have chosen to use the platform of Kapow to provide our scheme of work as it provides a clear structure and progression through lesson plans, risk assessments and CPD videos to help support teacher's subject knowledge/skill knowledge and allows for scaffolded learning that both supports teachers and in turn the children.

- Progression of skills and knowledge – The scheme provides steps to allow children to use prior learning, while building on that skill to progress.
- A cycle of learning – each unit follows a model of Design, Make, Evaluate.
- Increasing depth of learning – each skill is built upon year on year across their primary learning experience.

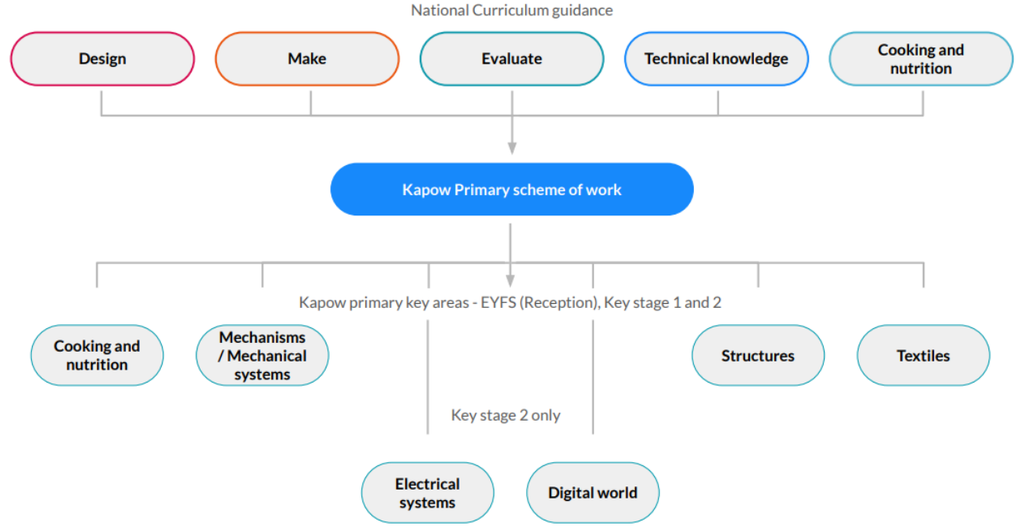
Our scheme of work fulfils the statutory requirements outlined in the **national curriculum (2014)**. The national curriculum Programme of study for Design and technology aims to ensure that all pupils:

- ★ 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.

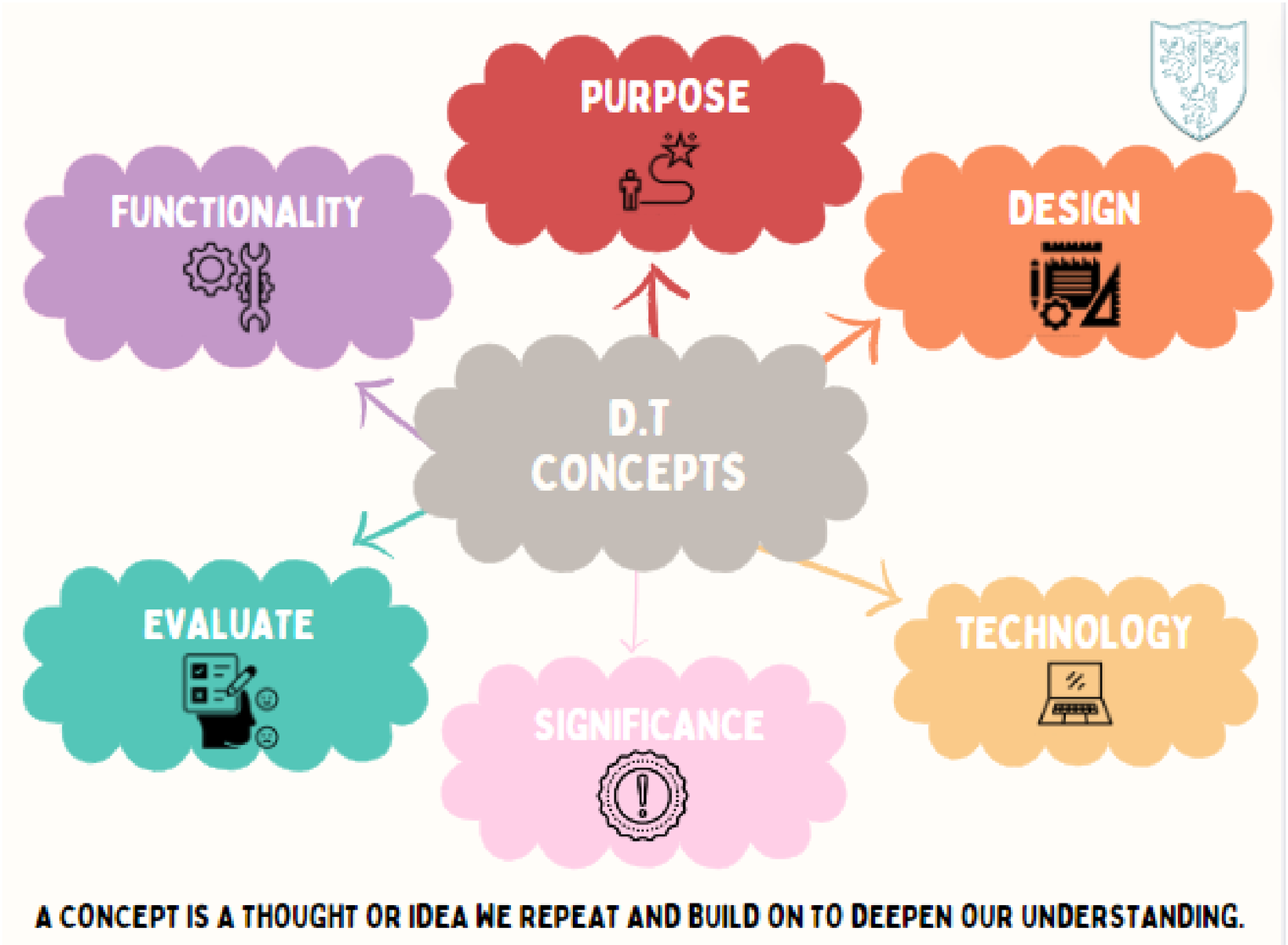
We have identified five key strands which run throughout our scheme of work:

- Design
- Make
- Evaluate
- Technical knowledge
- Cooking and nutrition

How is the Design and technology scheme of work organised?



Assessment in DT is supported through topic-specific tick sheets, which enable teachers to monitor pupils' progress in developing key knowledge and skills. Each topic area also has an assessment overview, identifying the key vocabulary, practical skills and sticky knowledge that pupils should acquire and retain. These documents support teachers in assessing understanding, identifying gaps and ensuring clear progression in knowledge and skills across year groups.


PURPOSE
FUNCTIONALITY
DESIGN
D.T
CONCEPTS
EVALUATE
TECHNOLOGY
SIGNIFICANCE
A CONCEPT IS A THOUGHT OR IDEA WE REPEAT AND BUILD ON TO DEEPEN OUR UNDERSTANDING.

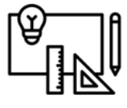
Yearly Overview

	Term 1	Term 2	Term 3	Term 4	Term 5	Extra day session (Term 6 for EYFS)
EYFS	**CP opportunities for junk modelling and modelling with construction kits** **Textiles** **Mini-me model**	**CP opportunities for junk modelling and modelling with construction kits** **Food** **Buttered toast** **Rice puff Christmas pudding cakes**	**CP opportunities for junk modelling and modelling with construction kits** **Structure** **Junk model fire truck** **Textiles** **Superhero mask** **Food** **Fruit Salad** **Fruit Smoothie**	**CP opportunities for junk modelling and modelling with construction kits** **Food** **Bread rolls, open sandwiches, biscuits** **Structure** **Building houses for 3 little pigs**	**CP opportunities for junk modelling and modelling with construction kits** **Food** **Butterfly cakes** **Mechanical** **Making a book with cover**	**CP opportunities for junk modelling and modelling with construction kits** **Food** **Pizza toppings** **Structure** **Boats/rafts**
Year 1	**Mechanical** **Making a moving story book**		**Textiles** **Puppets**		**Food** **Fruit and veg smoothie**	**Structure** **Constructing windmill – Nets**
Year 2	**Mechanical** **Moving monster**		**Food** **Design a healthy wrap**		**Textiles** **Pouches**	**Structure** **Baby bears chair**
Year 3	**Food** **Seasonal - Tarts**		**Structure** **Castles linked to Old Sarum**		**Mechanical** **Pneumatic toys**	**Textiles** **Cushions**
Year 4	**Food** **Adapting a recipe – Biscuits**		**Textiles** **Fastening**		**Structure** **Pavilions**	**Mechanisms** **Making a slingshot car**
Year 5	**Food** **What would be healthier – Bolognese sauce**		**Structure** **Bridges**		**Electric systems** **Wobble bots**	**Digital world** **Electronic charm (micro bit)** **Y3 unit**
Year 6	**Mechanical** **Automata toys**		**Electrical systems** **Steady Hand Game**		**Food** **Come dine with me – three course meal**	**Digital world** **Mindful moments timer (micro bit)** **Y4 unit**

Year 1 Unit Overview

Mechanical – Making a moving story book		
Procedural knowledge (skills)	**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.
Declarative (sticky) Knowledge	**Technical**	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.
	Additional	To know that in Design and technology we call a plan a 'design'.

LESSON OVERVIEWS

Mechanical By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Explore and evaluate a range of existing products ♦ Explore and use mechanisms [for example, levers, sliders, wheels and axles] ♦ Design purposeful, functional appealing products for themselves and other users based on design criteria ♦ Generate, develop, model, and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology ♦ Select and use a range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing) ♦ Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics ♦ Evaluate their ideas against design criteria
Session 1 	LO: To explore making mechanisms ♦ I understand that sliders are mechanisms ♦ I know that sliders can make things move ♦ I can create moving models that use sliders ♦ I can use the words: up, down, left, right, vertical and horizontal to describe movement
Session 2 	LO: To design a moving story book ♦ I can design three pages of my moving storybook by: ♦ drawing background pictures ♦ drawing the moving parts ♦ deciding whether I will use a side-to-side slider or an up-and-down slider on each page ♦ labelling the movement of each type of slider
Session 3 + 4 	LO: To construct a moving picture ♦ I can make my moving picture by: ♦ Drawing my background ♦ Drawing and cutting my moving parts ♦ Making sliders for my moving parts ♦ Putting all my parts together to create my moving picture ♦ Possibly making guides and bridges
Session 5 + 6 	LO: To evaluate my finished product ♦ I can review the success of my product by testing it (reading it to reception children) ♦ I can evaluate my product against the design criteria ♦ I can consider what I have learnt from making my moving story book

Year 1 Unit Overview

Textiles – Puppets		
Procedural knowledge (skills)	**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.
Declarative (sticky) Knowledge	**Technical**	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	

LESSON OVERVIEWS

Textiles By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Explore and evaluate a range of existing products ♦ Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately ♦ Design purposeful, functional, appealing products for themselves or other users based on design criteria. ♦ Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology ♦ Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics ♦ Evaluate their ideas and products against design criteria
Session 1 	LO: To join fabrics together using different methods ♦ I can remember that different techniques may be used to join fabrics for different purposes ♦ I know how to join fabric by pinning, stapling or glueing
Session 2 	LO: To use a template to create my design ♦ I can design a puppet ♦ I can build my design on a template
Session 3 & 4 	LO: To join two fabrics together accurately ♦ I can join fabrics together ♦ I can align two pieces of fabric ♦ I know how to use a template ♦ I can fit my hand into my puppet
Session 5 & 6 	LO: To embellish my design using joining methods ♦ I can use joining methods to decorate my puppet ♦ I can still put my hand into the puppet after it is decorated ♦ I can evaluate mine and others' work

Year 1 Unit Overview

Structure – Constructing a windmill		
Procedural (skills) knowledge	**Design**	Learning the importance of a clear design criteria. Including individual preferences and requirements in a design.
	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.
	Evaluate	Reflecting on a finished product, explaining likes and dislikes.
Declarative (sticky) Knowledge	**Technical**	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.
	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.

LESSON OVERVIEWS

Structure	
By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Design purposeful, functional, appealing products for themselves and other users based on design criteria ♦ Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology ♦ Explore and evaluate a range of existing products ♦ Evaluate their ideas and products against design criteria ♦ Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] ♦ Select from and use a wide range of materials and components, including construction materials, according to their characteristics ♦ Build structures, exploring how they can be made stronger, stiffer and more stable ♦ Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products
Session 1 	LO: To include individual preferences and requirements in my design ♦ I know what a windmill is ♦ I can describe the purpose of structures ♦ I understand the importance of clear design criteria ♦ I understand what a net is
Session 2 	LO: To make a stable structure ♦ I can follow instructions to cut and assemble the supporting structure of my windmill ♦ I know that that the shape of materials can be changed to improve the strength and stiffness of structures ♦ I know that cylinders are a strong type of structure that are often used for windmills and lighthouses ♦ I understand what stable means and can ensure my structure has this property
Session 3 & 4 	LO: To assemble the components of my structure ♦ I can cut and assemble my turbine correctly ♦ I understand that windmill turbines use wind to turn and make the machines inside work ♦ I know that axles are used in structures and mechanisms to make parts turn in a circle ♦ I can attach my turbine to the axle and attach them to the structure of my windmill ♦ I can test that my turbine turns in the structure and alter the parts if it doesn't
Session 5 & 6 	LO: To evaluate my project and adapt my design ♦ I can evaluate my windmill according to the design criteria ♦ I can test whether my structure is strong and stable and reinforce it if necessary ♦ I can test whether my turbine turns in the structure and alter the parts if it doesn't ♦ I can test whether my turbine turns freely in the wind/when blown on

Year 1 Unit Overview

Food – Fruit and Vegetables smoothies		
Procedural knowledge (skills)	**Design**	Designing smoothie carton packaging by-hand or on ICT software.
	Make	Chopping fruit and vegetables safely to make a smoothie. Identifying if a food is a fruit or a vegetable. Learning where and how fruits and vegetables grow.
	Evaluate	Tasting and evaluating different food combinations. Describing appearance, smell and taste. Suggesting information to be included on packaging
Declarative (sticky) knowledge	**Cooking and nutrition**	Understanding the difference between fruits and vegetables. To understand that some foods typically known as vegetables are actually fruits (e.g. cucumber). To know that a blender is a machine which mixes ingredients together into a smooth liquid. To know that a fruit has seeds and a vegetable does not. To know that fruits grow on trees or vines. To know that vegetables can grow either above or below ground. To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber).

LESSON OVERVIEWS

Food By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Understand where food comes from ♦ Explore and evaluate a range of existing products ♦ Use the basic principles of a healthy and varied diet ♦ Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology ♦ Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] ♦ Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics ♦ Evaluate their ideas and products against the design criteria
Session 1	LO: To identify if a food is a fruit or a vegetable ♦ I can name a number of fruits and vegetables ♦ I know how to determine if something is a fruit ♦ I understand that some foods we call vegetables are actually fruits
Session 2	LO: To identify where plants grow and which parts we eat ♦ I can remember how to determine if a food is a fruit or a vegetable roots or stem. Vegetables do not contain any seeds. ♦ I know that fruits and vegetables grow in one of three places: ○ on trees or vines ○ above the ground ○ below the ground
Session 3	LO: To taste and compare fruit and vegetables ♦ I can suggest what fruits and/or vegetables are in a drink ♦ I can taste fruits and vegetables and describe their: ○ Appearance/feel smell taste ♦ I can make a choice as to what smoothie I will make and why
Session 4	LO: To make a fruit and vegetable smoothie. ♦ I can describe how to prepare some fruit and vegetables before they are eaten. ♦ I can cut soft fruit safely. ♦ I can describe how my smoothie tastes.

Year 2 Unit Overview

Mechanical – Make a moving monster		
Procedural knowledge (Skills)	**Design**	Creating 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	Evaluating own designs against design criteria. Using peer feedback to modify a final design.
Declarative (sticky) Knowledge	**Technical**	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.
	Additional	To know some real-life objects that contain mechanisms.

LESSON OVERVIEWS

Mechanical By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Explore and evaluate a range of existing products ♦ Explore and use mechanisms [for example, levers, sliders, wheels and axles] in their products ♦ Design purposeful, functional, appealing products for themselves and other users based on design criteria ♦ Generate, develop, model and communicate their ideas through talking and drawing, templates, mock-ups and, where appropriate, information and communication technology ♦ Evaluate their ideas and products against design criteria ♦ Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics
Session 1 	LO: To look at objects and understand how they move ♦ I understand that mechanisms are a collection of moving parts that work together in a machine ♦ I know that there is always an input and output in a mechanism ♦ I can identify mechanisms in everyday objects ♦ I understand that a lever is something that turns on a pivot ♦ I understand that a linkage is a system of levers that are connected by pivots ♦ I can help devise whole-class design criteria for what our moving monster should do
Session 2 	LO: To look at objects and understand how they move ♦ I understand that mechanisms are a collection of moving parts that work together in a machine ♦ I know that there is always an input and output in a mechanism ♦ I can identify mechanisms in everyday objects ♦ I understand that a lever is something that turns on a pivot ♦ I understand that a linkage is a system of levers that are connected by pivots ♦ I can help devise whole-class design criteria for what our moving monster should do
Session 3 	LO: To explore different design options ♦ I understand that linkages use levers and pivots to create motion ♦ I can think of two of my own points to add to the class Design Criteria ♦ I can draw two moving monster designs that meet all points of my Design Criteria ♦ My design includes the linkage I will use to make my monster move
Session 4 & 5 	LO: To make a moving monster ♦ I know how to make linkages by connecting levers and pivots ♦ I know that materials can be selected according to their characteristics ♦ I can design and make the features of my monster ♦ I can evaluate how functional my monster is and whether it meets the Design Criteria

Year 2 Unit Overview

Food – A balanced diet - Wrap		
Procedural knowledge (skills)	**Design**	Designing a healthy wrap based on a food combination which works well together.
	Make	Slicing food safely using the bridge or claw grip. Constructing a wrap that meets a design brief.
	Evaluate	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.
Declarative (sticky) Knowledge	**Cooking and nutrition**	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 food and drinks we do not expect to contain sugar do; we call these 'hidden sugars'.

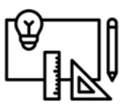
LESSON OVERVIEWS

Food By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Understand where food comes from ♦ Use the basic principles of a healthy and varied diet to prepare dishes ♦ Explore and evaluate a range of existing products ♦ Use the basic principles of a healthy and varied diet to prepare dishes ♦ Design purposeful, functional, appealing products for themselves and other users based on design criteria ♦ Evaluate their ideas and products against design criteria
Session 1 	LO: To know what makes a balanced diet ♦ I know what 'hidden sugars' are ♦ I know where to find the nutritional information on a drinks container ♦ I know that there are five food groups, made up of: o fruit and vegetables starchy carbohydrates o Proteins dairy o oils and spreads ♦ I know roughly how much of each food group I should eat each day
Session 2 	LO: To taste test food combinations ♦ I can remember what foods fall into what food groups ♦ I know how to experience food through touch and smell ♦ I can consider and review food combinations ♦ I know that the most ideal ingredient combinations for my wrap will contain foods from more than one food group
Session 3 	LO: To design a healthy wrap. ♦ I can remember which food combinations work well together. ♦ I can design three possible wraps based on these combinations. ♦ I can choose one of these to make as my 'Final Design'. ♦ I know how to slice food safely using the bridge or claw grip.
Session 4 	LO: To make a healthy wrap. ♦ I can remember how to prepare food safely. ♦ I can make a healthy wrap. ♦ I know how to review my design.

Year 2 Unit Overview

Textiles – Pouches		
Procedural knowledge (skills)	**Design**	Designing a pouch.
	Make	Selecting and cutting fabrics for sewing. Decorating a pouch using fabric glue or running stitch. Threading a needle. Sewing running stitch, with evenly spaced, neat, even stitches to join fabric. Neatly pinning and cutting fabric using a template.
	Evaluate	Troubleshooting scenarios posed by teacher. Evaluating the quality of the stitching on others' work. Discussing as a class, the success of their stitching against the success criteria. Identifying aspects of their peers' work that they particularly like and why.
Declarative (sticky) Knowledge	**Technical**	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.

LESSON OVERVIEWS

Textiles By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Select from and use a range of tools and equipment to perform practical tasks ♦ Design purposeful, functional, appealing products for themselves and other users ♦ Select from and use a wide range of materials and components, including construction materials, textiles and ingredients according to their characteristics ♦ Evaluate their ideas and products against a design criteria
Session 1 	LO: To sew a running stitch ♦ I can thread a needle ♦ I can sew a running stitch ♦ I can use neat and evenly spaced stitches to join fabric
Session 2 	LO: To sew a running stitch ♦ I can remember how to use a template ♦ I can cut fabric neatly ♦ I can pin fabric accurately ♦ I can design a pouch
Session 3 & 4 	LO: To join fabrics using a running stitch ♦ I can sew neat, even stitches ♦ I tie a knot at either end of the thread ♦ I can design decorations for my product
Session 5 	LO: To decorate a pouch using fabric glue or stitching ♦ I can join items using fabric glue or stitching ♦ I can decorate fabric using different items ♦ I can evaluate my own designs

Year 2 Unit Overview

Structure – Baby bear's chair		
Procedural knowledge (skills)	**Design**	Generating and communicating ideas using sketching and modelling.
	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
	Evaluate	Testing the strength of own structure. Identifying the weakest part of a structure. Evaluating the strength, stiffness and stability of own structure.
Declarative (sticky) Knowledge	**Technical**	To know that materials can be manipulated to improve strength and stiffness. To know that a structure is something which has been formed or made from parts. To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move. To know that a 'strong' structure is one which does not break easily. To know that a 'stiff' structure or material is one which does not bend easily.
	Additional	

LESSON OVERVIEWS

Structure By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Explore and evaluate a range of existing products ♦ Evaluate their ideas and products against design criteria ♦ Build structures, exploring how they can be made stronger, stiffer and more stable ♦ Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics ♦ Design purposeful, functional, appealing products for themselves and other users based on design criteria ♦ Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology
Session 1	LO: To explore the concept and features of structures and the stability of different shapes ♦ I can identify natural and man-made structures ♦ I understand what is meant by stability and can identify when a structure is more or less stable than another ♦ I know that shapes and structures with wide, flat bases or legs are the most stable
Session 2	LO: To explore strength in different structures LO: To understand that the shape of the structure affects its strength ♦ I know the meaning of the words strength, stiffness and stability ♦ I know there are different ways paper can be folded to improve its strength and stiffness ♦ I can build a strong and stiff structure by folding paper ♦ I can test the strength of my structure
Session 3	LO: To make a structure according to design criteria ♦ I can remember that chairs are structures and need to be strong, stiff and stable ♦ I know how to create joints and structures from paper/card and tape
Session 4 & 5	LO: To produce a finished structure and evaluate its strength, stiffness and stability ♦ I know that the chair I design for Baby Bear needs to: support Teddy; be strong, stiff and stable ♦ I know how to create joints and structures ♦ I can evaluate my structure according to the design criteria

Year 3 Unit Overview

Food – Eating seasonally - Tart		
Procedural knowledge (skills)	**Design**	Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish.
	Make	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.
	Evaluate	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
Declarative (sticky) Knowledge	**Cooking and nutrition**	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.

LESSON OVERVIEWS

Food By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Understand and apply the principles of a healthy and varied diet. ♦ Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. ♦ Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed
Session 1 	LO: To know that climate affects food growth. ♦ I know that not all fruits and vegetables can be grown in the UK. ♦ I know that each country has its own climate. ♦ I understand that these climates enable different fruits and vegetables to grow. ♦ I can consider hygiene when preparing food. ♦ I can use cooking equipment safely.
Session 2 	LO: To understand the advantages of eating seasonal foods grown in the UK. ♦ I know that imported food will have travelled from far away and has an impact on the environment. ♦ I know that vegetables and fruit grow in certain seasons and that in the UK we often import food from other countries when it is not in season.
Session 3 	LO: To create a recipe that is healthy and nutritious using seasonal vegetables and fruits. ♦ I know what foods are currently in season. ♦ I am aware that each vegetable and fruit gives us nutritional benefits. ♦ I can design a puff pastry tart using seasonal vegetables and fruits. ♦ I can describe my puff pastry tart and the benefits of its ingredients.
Session 4 	LO: To safely follow a recipe when cooking. ♦ I know how to prepare a kitchen to cook in. ♦ I know how to prepare myself to start cooking. ♦ I know the basic rules of food contamination. ♦ I can use, store and clean a knife safely. ♦ I can follow a recipe to make a tart.

Year 3 Unit Overview

Structure – Constructing a castle		
Procedural knowledge (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.
	Make	Constructing a range of 3D geometric shapes using nets . Creating special features for individual designs. Making facades from a range of recycled materials.
	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.
Declarative (sticky) Knowledge	**Technical**	To understand that wide and flat based objects are more stable. To understand the importance of strength and stiffness in structures.
	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.

LESSON OVERVIEW

Structure By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] accurately ♦ Select from and use a wide range of materials and components, including construction materials, textiles and ingredients according to their characteristics / according to their functional properties and aesthetic ♦ Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups ♦ Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work ♦ Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design ♦ Apply their understanding of how to strengthen, stiffen and reinforce more complex structures
Session 1	LO: To recognise how multiple shapes (2D and 3D) are combined to form a strong and stable structure. ♦ I can identify different features of castles. I can design my own castle. ♦ I can label the features of my castle. I can explain why a castle needs to be strong and stable.
Session 2	LO: To design a castle ♦ I know the features of a castle ♦ I can add two design points to the Design Specification to appeal to the person/purpose of my castle ♦ I can draw the design of my castle using 2D shapes, labelling: the 3D shapes that will create the features, materials I need, colours I will use
Session 3 & 4	LO: To construct 3D nets ♦ I know that a net is what a 3D shape would look like if it were opened out flat ♦ I can construct a range of 3D geometric shapes using a net by: ♦ Cutting along the bold lines ♦ Folding along the dotted lines ♦ Keeping the tabs the correct size ♦ Making crisp folded edges ♦ Constructing the net using glue to make a geometric shape
Session 5 & 6	LO: To construct and evaluate my final product ♦ I can construct my castle to meet the requirements of my brief by: -making neat 3D shapes using nets -stacking shapes and recyclable materials to make the structures of my castle -creating a castle base to secure my structures to -adorning my castle with facades and other decorative features ♦ I can evaluate my work and the work of others

Year 3 Unit Overview

Mechanical – Pneumatic toys		
Procedural knowledge (skills)	**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.
Declarative (sticky) Knowledge	**Technical**	To understand how pneumatic systems work. To understand that pneumatic systems can be used as part of a mechanism. To know that pneumatic systems operate by drawing in, releasing and compressing air.
	Additional	To 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.

LESSON OVERVIEWS

Mechanical By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups ♦ Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design ♦ Understand and use mechanical systems in their products, for example, gears, pulleys, cams, levers and linkages ♦ Select from and use a wider range of tools and equipment to perform practical tasks accurately ♦ Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities ♦ Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
Session 1 	LO: To understand how pneumatic systems work ♦ I know that mechanisms are a system of parts that work together to create motion ♦ I know that a pneumatic system can be used as part of a mechanism ♦ I know that pneumatic systems are used in a range of everyday objects ♦ I know that a pneumatic system can force air over a distance to create movement
Session 2 	LO: To design a toy that uses a pneumatic system ♦ I can develop design criteria from a design brief ♦ I can generate suitable ideas using thumbnail sketches and exploded diagrams ♦ I know that there are three different types of pneumatic systems that I can use to design my toy and I can use recycled household objects to make it ♦ I know that different types of drawings are used in design to explain ideas clearly
Session 3 & 4 	LO: To create a pneumatic system ♦ I can create a pneumatic system to create a desired motion ♦ I can build secure housing for a pneumatic system ♦ I know that syringes and balloons can be used to create different types of pneumatic systems ♦ I know how to use these components to make a functional and appealing pneumatic toy
Session 5 & 6 	LO: To test and finalise ideas against design criteria ♦ I can remember that materials are selected due to their functional and aesthetic characteristics ♦ I know how to manipulate materials to create different effects by cutting, creasing, folding, weaving, etc.

Year 3 Unit Overview

Textiles – Cross-stitch and appliqué - Cushions		
Procedural knowledge (skills)	**Design**	Designing and making a template from an existing cushion and applying individual design criteria.
	Make	Following design criteria to create a cushion or Egyptian collar. Selecting and cutting fabrics with ease using fabric scissors. Threading needles with greater independence. Tying knots with greater independence. Sewing cross stitch to join fabric. Decorating fabric using appliqué. Completing design ideas with stuffing and sewing the edges
	Evaluate	Evaluating an end product and thinking of other ways in which to create similar items.
Declarative (sticky) Knowledge	**Technical**	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.

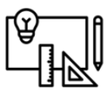
LESSON OVERVIEWS

Textiles By the end of this block you will have achieved the following **National Curriculum outcomes**	When designing and making, pupils should be taught to: ♦ select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] ♦ select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics' ♦ design purposeful, functional, appealing products for themselves and other users based on design criteria'
Session 1 	LO: To learn how to sew cross-stitch and appliqué. ♦ I can use cross-stitch. ♦ I know how to appliqué. ♦ I can reflect on techniques used.
Session 2 	LO: To design a product and its template. ♦ I can design a cushion. ♦ I can use a paper template. ♦ I can cut fabric accurately.
Session 3 & 4 	LO: To decorate fabric using appliqué and cross-stitch. ♦ I can follow a design criteria. ♦ I can use cross stitch. ♦ I can add appliqué.
Session 5 & 6 	LO: To assemble and complete a cushion. ♦ I can use stitches to join fabrics. ♦ I can leave space for a seam. ♦ I understand why some products are turned inside out after sewing.

Year 4 Unit Overview

Food – Adapting a recipe – biscuits		
Procedural knowledge (skills)	**Design**	Designing a biscuit within a given budget, drawing upon previous taste testing judgements.
	Make	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).
	Evaluate	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).
Declarative (sticky) Knowledge	**Cooking and nutrition**	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.

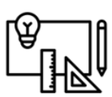
LESSON OVERVIEWS

Food By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups. ♦ Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. ♦ Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately. ♦ Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities. ♦ Investigate and analyse a range of existing products. ♦ Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. ♦ Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.
Session 1 	LO: To follow a baking recipe. SC: I can evaluate a product and consider: ♦ Taste. smell. ♦ Texture. appearance. ♦ packaging. ♦ target audience. ♦ I can follow a recipe to make a biscuit.
Session 2 	LO: To make and test a prototype. ♦ I know how to cook food safely – following basic hygiene rules. ♦ I can cook to a recipe and adapt it to create a new biscuit prototype. ♦ I can evaluate and compare a range of biscuit prototype.
Session 3 	LO: To design a biscuit to a given budget. ♦ I can work as a group to design a biscuit that would sell for £1.99. ♦ In my group we will: o consider biscuits we have tasted and the successes of the prototypes we have made. o complete a budget to ensure that we spend within the limit. o make decisions as part of a team to finalise the recipe we will make. ♦ I can create branding for my group's final product.
Session 4 	LO: To make a biscuit that meets a given design brief. ♦ I can consider safety and hygiene when baking. ♦ My group can use the ingredient quantities specified in our budget. ♦ I can make suitable packaging for my product.

Year 4 Unit Overview

Textiles – Fastening		
Procedural knowledge (skills)	**Design**	Writing design criteria for a product, articulating decisions made. Designing a personalised book sleeve.
	Make	Making and testing a paper template with accuracy and in keeping with the design criteria. Measuring, marking and cutting fabric using a paper template. Selecting a stitch style to join fabric, working neatly by sewing small, straight stitches. Incorporating fastening to a design.
	Evaluate	Testing and evaluating an end product against the original design criteria. Deciding how many of the criteria should be met for the product to be considered successful. Suggesting modifications for improvement. Articulating the advantages and disadvantages of different fastening types.
Declarative (sticky) Knowledge	**Technical**	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.

LESSON OVERVIEWS

Textiles By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Investigate and analyse a range of existing products. ♦ Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups. ♦ Build structures, exploring how they can be made stronger, stiffer or more stable ♦ Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately ♦ Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities ♦ Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
Session 1 	LO: To identify and evaluate different types of fastenings LO: To explain the advantages and disadvantages of each fastening type ♦ I know what the main types of fastenings are ♦ I can say what the benefits of each fastening type are ♦ I can say what the disadvantages of each fastening type are.
Session 2 	LO: To design a product to meet design criteria ♦ I can design a product based on a design criteria ♦ I can write a design criteria ♦ My design includes a fastening
Session 3 & 4 	LO: To make and test a paper template ♦ I can make a paper template ♦ I know how to test my paper template
Session 5 & 6 	LO: To assemble a book jacket ♦ I can join fabric by sewing ♦ I can stick to my design criteria ♦ My product is fit for purpose

Year 4 Unit Overview

Structure – Pavilions		
Procedural knowledge (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.
	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.
	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.
Declarative (sticky) Knowledge	**Technical**	To understand what a frame structure is. To know that a 'free-standing' structure is one which can stand on its own.
	Additional	To know 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.

LESSON OVERVIEWS

Structure By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose aimed at particular individuals or groups. ♦ Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes and CAD ♦ Select from and use a wider range of materials, components and construction materials according to their functional properties and aesthetics ♦ Investigate and analyse a range of existing product ♦ Generate, develop, model and communicate their ideas through discussion, annotated sketches ♦ Select from and use a wider range of tools and equipment to perform practical tasks ♦ Apply their understanding of how to strengthen, stiffen and reinforce more complex structures
Session 1 	LO: To create a range of different shaped frame structures ♦ I can make a variety of different frame structures. ♦ I know what the structure (pavilion) is used for.
Session 2 	LO: To design a structure ♦ I know that different materials can create different effects ♦ I understand how to make a stable structure ♦ I can design a structure that is stable and aesthetically pleasing
Session 3 	LO: To build a frame structure ♦ I can build a free-standing structure ♦ I can select appropriate materials to build a strong structure ♦ I know how to reinforce corners to strengthen my structure ♦ I refer to my design sheet to create my pavilion
Session 4 + 5 	LO: To add cladding to a frame structure ♦ I can select appropriate materials for my cladding ♦ I can add cladding which reflects my design ♦ I can create different textural effects with my chosen material

Year 4 Unit Overview

Mechanical – Make a sling shot car		
Procedural knowledge (skills)	**Design**	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.
	Make	Measuring, marking, cutting and assembling with increasing accuracy. Making a model based on a chosen design.
	Evaluate	Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.
Declarative (sticky) Knowledge	**Technical**	To know that air resistance is the level of drag on an object as it is forced through the air. To understand that the shape of a moving object will affect how it moves due to air resistance.
	Additional	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.

LESSON OVERVIEWS

Mechanical By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately ♦ Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities ♦ Investigate and analyse a range of existing products ♦ Understand how key events and individuals in design and technology have helped shape the world ♦ Apply their understanding of how to strengthen, stiffen and reinforce more complex structures ♦ Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] ♦ Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups ♦ Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design ♦ Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
Session 1	LO: To build a car chassis ♦ I understand that car designs have developed over many years ♦ I know that a chassis is the frame of a car on which everything else is built ♦ I know that all moving things have kinetic energy ♦ I know that kinetic energy is the energy that something (an object or person) has by being in motion, eg: the energy that a swing has to keep on moving; any object in motion is using kinetic energy
Session 2	LO: To design a shape that reduces air resistance ♦ Drawing a net to create a structure from ♦ Choosing shapes that increase or decrease the speed of the car as a result of air resistance ♦ Adding graphics to personalise my design
Session 3 + 4	LO: To make a model based on a chosen design ♦ Remembering that nets are flat shapes that can be turned into 3D structures ♦ Measuring, marking and cutting the panels (nets) against the dimensions of my chassis ♦ Including tabs on my net so I can secure it to the panels of my chassis ♦ Decorating the panels
Session 5 + 6	LO: To assemble and test my completed product ♦ I can assemble the panels of the body to the chassis correctly ♦ I can remember that smaller shapes create less air resistance and can move faster through the air ♦ I can evaluate the speed of my design based on the understanding that some cars are faster than others as a result of: • Body shape • Stored energy in the elastic band • Accuracy of the angle in the chassis and axle

Year 5 Unit Overview

Food – What could be healthier – Bolognese		
Procedural knowledge (skills)	**Design**	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.
	Make	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.
	Evaluate	Identifying the nutritional differences between different products and recipes. Identifying and describing healthy benefits of food groups.
Declarative (sticky) Knowledge	**Cooking and nutrition**	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.

LESSON OVERVIEWS

Food By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Understand and apply the principles of a healthy and varied diet. ♦ Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. ♦ Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. ♦ Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups. ♦ Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. ♦ Investigate and analyse a range of existing products. ♦ Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. ♦ Understand how key events and individuals in design and technology have helped shape the world. ♦ Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately ♦ Apply their understanding of computing to program, monitor and control their products.
Session 1	LO: To understand where food comes from ♦ I know that beef is the name of meat from cattle (cows) ♦ I know how beef is reared and processed ♦ I have an understanding of the ethical issues around the way in which cattle should be farmed
Session 2	LO: To understand the term 'healthy' ♦ I know what foods make up a balanced diet ♦ I know how a recipe can be adapted to make it healthier ♦ I can use keywords to research for alternative ingredients for a well-known dish ♦ Based on my research I can suggest healthy substitutions and additions to a recipe
Session 3	LO: To adapt a traditional recipe ♦ I know that the nutritional value of a recipe can change if you remove, substitute or add additional ingredients ♦ I can calculate and compare two adapted Bolognese recipes using a nutritional calculator ♦ Based on this information I can decide which recipe is healthier ♦ I can write an amended method for my recipe to incorporate the relevant changes to ingredients
Session 4	LO: To complete a food product. ♦ I can use equipment safely, including knives, hot pans and hobs. ♦ I know how to avoid cross-contamination. ♦ I can carefully follow a method to make a recipe. ♦ I know how to chop an onion. ♦ I can design appealing packaging that reflects my recipe.

Year 5 Unit Overview

Structure – Bridges		
Procedural knowledge (skills)	**Design**	Designing a stable structure that is able to support weight. Creating a frame structure with a focus on triangulation.
	Make	Making a range of different shaped beam bridges. Using triangles to create truss bridges that span a given distance and support a load. Building a wooden bridge structure. Independently measuring and marking wood accurately. Selecting appropriate tools and equipment for particular tasks. Using the correct techniques to saws safely. Identifying where a structure needs reinforcement and using card corners for support. Explaining why selecting appropriating materials is an important part of the design process. Understanding basic wood functional properties.
	Evaluate	Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary. Suggesting points for improvements for own bridges and those designed by others.
Declarative (sticky) Knowledge	**Technical**	To understand some different ways to reinforce structures. To understand how triangles can be used to reinforce bridges. To know that properties are words that describe the form and function of materials. To understand why material selection is important based on properties. To understand the material (functional and aesthetic) properties of wood.
	Additional	To understand the difference between arch, beam, truss and suspension bridges. To understand how to carry and use a saw safely.

LESSON OVERVIEWS

Structure By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Generate, develop, model and communicate their ideas through discussion and prototypes ♦ Select from and use a wider range of materials, components and construction materials according to their functional properties and aesthetics ♦ Investigate and analyse a range of existing products ♦ Apply their understanding of how to strengthen, stiffen and reinforce more complex structures ♦ Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose aimed at particular individuals or groups ♦ Select from and use a wider range of tools and equipment to perform practical tasks ♦ Evaluate their ideas and products against design criteria and consider the views of others to improve their work
Session 1 	LO: To explore how to reinforce a beam (structure) to improve its strength ♦ I can identify beam and arch bridges ♦ I can create a range of beam and arch bridge designs ♦ I can identify stronger and weaker structures ♦ I can find different ways to reinforce structures
Session 2 	LO: To build a spaghetti truss bridge ♦ I can identify arch, beam and truss bridges ♦ I can use triangles to create truss bridges and test them ♦ I understand how triangles can be used to reinforce bridges
Session 3 + 4 	LO: To build a wooden truss bridge. ♦ I can measure and mark out accurately on wood ♦ I can select appropriate tools and equipment for particular tasks ♦ I can follow health and safety rules ♦ I can explain why selecting appropriating materials is an important part of the design process
Session 5 + 6 	LO: To complete, reinforce and evaluate my truss bridge. ♦ I can complete my wooden truss bridge ♦ I can identify points of weakness and reinforce them as necessary following testing ♦ I can evaluate my truss bridge against a specification

Year 5 Unit Overview

Electrical Systems – Wobble bots		
Procedural knowledge (skills)	**Design**	Creating more complex design criteria that require considering detailed user needs, environmental impact, materials and cost. Developing more independence in generating ideas. Coming up with a broader range of ideas and deeper innovation, requiring pupils to think critically about the practicality and originality of their ideas. Using a series of prototypes to refine and improve their designs.
	Make	Producing lists of equipment, materials and tools that they need for a task. Creating a step-by-step plan for making. Selecting materials, components or ingredients based on research or user needs. Explaining their choices, referring to their research. Understanding and explaining the importance of each safety rule. Applying safety instructions consistently. Balancing aesthetics and functionality when creating parts of a design. Considering when best to apply finishing effects.
	Evaluate	Reflecting on the usability, aesthetics, innovation and sustainability of products and discussing how design choices impact these aspects. Assessing their designs against a more complex set of design criteria that includes functionality, aesthetics, user experience, sustainability and cost. Considering alternative materials, tools or techniques that could enhance the product. Providing feedback that is helpful, specific and encouraging. Incorporating feedback from peers or users to improve their product further, explaining the changes they made and the impact they had.
Declarative (sticky) Knowledge	**Technical**	Beginning to understand that electricity flows around a circuit. Using different components to produce different results from electrical systems. Creating working electrical circuits with a wider variety of electrical components. Deconstructing electrical systems to understand how they work.
	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).

LESSON OVERVIEWS

Electrical Systems By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Identify some simple elements of a circuit (battery, wires, bulb, motor and switch) and explain their function. ♦ Explain that for electricity to flow around a circuit, it must be closed. ♦ Describe a motor as an electrical circuit component that changes electricity into movement. ♦ Provide examples of motorised products that use movement to rotate or spin different parts. ♦ Make a product that uses a motor. ♦ Design a motorised product for a particular purpose. ♦ Determine appropriate design criteria based on the function of the proposed product. ♦ Explain design choices based on the desired functionality of a product. ♦ Create an innovative motorised product based on knowledge of existing products. ♦ Discuss the effectiveness of a product while considering the design criteria.
Session 1 	LO: To investigate motors by creating circuits. ♦ I can create a working circuit with a motor. I can understand that motors use electricity to create movement. ♦ I can name some products that use motors.
Session 2 	LO: To make a motorised product and test its function. ♦ I can make a working product with a motor. I can spot and solve problems when making. ♦ I can explain how a motorised product works.
Session 3 	LO: To apply knowledge of circuits to experiment with product design. ♦ I can evaluate the effectiveness of changes made to a product. I can record observations. ♦ I can determine which parts of the product affect its function.
Session 4 	LO: To design a motorised product for a specific purpose. ♦ I can use research to suggest ideas for a product. I can explain my decisions about the form and function of a product. ♦ I can define the design criteria for my product to be successful.
Session 5 	LO: To make and evaluate the effectiveness of a motorised product. ♦ I can make a functioning product with a motor. I can use tools accurately to cut and join materials. ♦ I can evaluate how well my product works by using the design criteria.

Year 5 Unit Overview

Digital World – Wearable technology (Year 3 unit due to prior knowledge)		
Procedural knowledge (skills)	**Design**	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	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.
	Evaluate	Analysing and evaluating an existing product. Identifying the key features of a pouch.
Declarative (sticky) Knowledge	**Technical**	To understand that, in programming, a 'loop' is code that repeats something again and again until stopped. To know that a Micro:bit is a pocket-sized, codeable computer.
	Additional	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'.

LESSON OVERVIEWS

Digital World By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups ♦ Understand how key events and individuals in design and technology have helped shape the world ♦ Apply their understanding of computing to program, monitor and control their products ♦ Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design ♦ Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology ♦ Select from and use a wider range of tools and equipment Items and objects which are needed to complete a task. to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately ♦ Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities ♦ Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
Session 1 	LO: To understand the impact of the digital revolution in the world of (D&T) product design ♦ I can identify some key product developments that occurred as a result of the digital revolution ♦ I can analyse and evaluate an existing product ♦ I can problem solve by suggesting potential features on the Micro: bit and justifying my ideas
Session 2 	LO: 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 ♦ I can write a program to control (button press) and/or monitor (sense light) to initiate a flashing LED algorithm. ♦ I understand what a loop is in programming ♦ I can explain the basic functionality of my eCharm program
Session 3 + 4 	LO: To create and decorate a foam pouch for the eCharm, using a template ♦ I can identify the key features of a pouch ♦ I can develop design ideas for a technology pouch ♦ I can use a template when cutting and assembling the pouch
Session 5 + 6 	LO: To design a display badge and/or stand using CAD (computer-aided design) software for an eCharm product ♦ I can draw and manipulate 2D shapes, using computer-aided design, to produce a point of sale badge ♦ I understand what is meant by 'point of sale display' ♦ I can follow a list of design requirements

Year 6 Unit overview

Food – Come dine with me – Three course meal (Peppers, Salmon and Pineapple)		
Procedural knowledge (skills)	**Design**	Writing a recipe, explaining the key steps, method and ingredients. Including facts and drawings from research undertaken.
	Make	Following a recipe, including using the correct quantities of each ingredient. Adapting a recipe based on research. Working to a given timescale. Working safely and hygienically with independence.
	Evaluate	Evaluating a recipe, considering: taste, smell, texture and origin of the food group. Taste testing and scoring final products. Suggesting and writing up points of improvements 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.
Declarative (sticky) Knowledge	**Cooking and nutrition**	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).

LESSON OVERVIEWS

Food By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups. ♦ Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. ♦ Understand and apply the principles of a healthy and varied diet. ♦ Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. ♦ Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. ♦ Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately. ♦ Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities. ♦ Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.
Session 1 	LO: To research and design a three-course meal. ♦ I know how to research a recipe by ingredient. ♦ I understand that not all courses complement one another. ♦ I can list the ingredients I need for my chosen recipe. ♦ I can read the method and make a list of all of the equipment I need for my chosen recipe.
Session 2 	LO: To prepare a meal using a recipe. LO: To understand where their food comes from. LO: To write up a recipe. ♦ I can prepare ingredients and follow a recipe safely and sensibly. ♦ I can describe the process of 'Farm to Fork' for a given ingredient using a storyboard. ♦ I can contribute a well-written recipe page to a class cookbook using imperative verbs, adjectives and illustrations
Session 3 	LO: To prepare a meal using a recipe. LO: To understand where their food comes from. LO: To write up a recipe. ♦ I can prepare ingredients and follow a recipe safely and sensibly. ♦ I can describe the process of 'Farm to Fork' for a given ingredient using a storyboard. ♦ I can contribute an attractive and easily understood recipe page to a class cookbook using imperative verbs, adjectives and illustrations.
Session 4 	LO: To prepare a meal using a recipe. LO: To understand where their food comes from. LO: To write up a recipe. ♦ I can prepare ingredients and follow a recipe safely and sensibly. ♦ I can describe the process of 'Farm to Fork' for a given ingredient using a storyboard. ♦ I can contribute an attractive and easily understood recipe page to a class cookbook using imperative verbs, adjectives and illustrations.

Year 6 Unit overview

Electrical Systems – Steady hand game		
Procedural knowledge (skills)	**Design**	Designing a steady hand game, identifying and naming the components required. Drawing a design from three different perspectives.
	Make	Generating ideas through sketching and discussion. 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.
	Evaluate	Testing their own and others' finished games, identifying what went well and making suggestions for improvement.
Declarative (sticky) Knowledge	**Technical**	To know that an electrical circuit must be complete for electricity to flow. To know that a switch can be used to complete and break an electrical circuit.
	Additional	To understanding the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'..

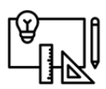
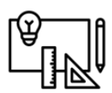
LESSON OVERVIEWS

Electrical Systems By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Explain simply what is meant by 'form' (the shape of a product) and 'function' (how a product works). ♦ State what they like or dislike about an existing children's toy and why. ♦ Learn about skills developed through play and apply this knowledge in a survey of one or more children's toys. ♦ Identify the components of a steady hand game. ♦ Design a steady hand game of their own according to their design criteria, using four different perspective drawings. ♦ Create a secure base for their game, with neat edges, that relates to their design. ♦ Make and test a functioning circuit and assemble it within a case.
Session 1	LO: To design a steady hand game ♦ I can research images and information about existing children's toys. ♦ I can analyse a selection of existing children's toys. ♦ I can apply my knowledge of form and function.
Session 2	LO: To analyse and evaluate electrical products ♦ I can identify and name the components in a steady hand game. ♦ I can decide on clear design criteria for my game. ♦ I can design a game and draw it from three different perspectives. ♦ I can create a design that reflects the design criteria.
Session 3	LO: To construct a stable base. ♦ I can accurately cut and assemble a net. ♦ I can decorate the base and ensure a high-quality finish. ♦ I can ensure that the sides of the base are aligned when glued. ♦ I can use tabs to secure the pieces of the net in place.
Session 4 + 5	LO: To assemble electronics and complete their electronic game. ♦ I can make and test a circuit. ♦ I can incorporate a circuit into a base. ♦ I can name electrical components.

Year 6 Unit overview

Mechanical – Automata toys		
Procedural knowledge (skills)	**Design**	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.
	Make	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.
	Evaluate	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.
Declarative (sticky) Knowledge	**Technical**	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.
	Additional	To know that an automata is a hand powered mechanical toy. To know that a cross-sectional diagram shows the inner workings of a product. 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.

LESSON OVERVIEWS

Mechanical By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups. ♦ Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately. ♦ Understand how key events and individuals in design and technology have helped shape the world ♦ Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design ♦ Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities ♦ Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] ♦ Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
Session 1 	LO: To prepare wood for assembly by measuring, marking and cutting each piece ♦ I can measure, mark and check the accuracy of the wood and card automata components ♦ I can follow health and safety rules ♦ I can suggest appropriate design criteria points to fulfil the design brief
Session 2 	LO: To assemble the automata frame components and supports with the help of an exploded-diagram ♦ I can assemble a product with the support of an exploded-diagram ♦ For my frame to function effectively I know that: o the components must be cut accurately o the joints of my frame should be secured at right angles ♦ I know that a glue gun can be dangerous if not used properly
Session 3 + 4 	LO: To explore the relationship between cam profiles and follower movement, to inform a design decision ♦ I understand the cam profile causes a follower to rise, fall or remain static at different points depending on its shape ♦ I can make informed design decisions based on my exploration of cam profiles ♦ I can complete an automata mechanism including cam, follower and axle
Session 5 + 6 	LO: To apply the housing and finishing touches to the automata frame ♦ I can measure and apply panels to my automata to conceal the inner-workings ♦ I know that good quality products should be neat, accurate and securely assembled

Year 6 Unit overview

Digital World – Mindful moments timer (This is a Y4 unit due to prior learning)		
Procedural knowledge (skills)	**Design**	Writing design criteria for a programmed timer (Micro:bit). Exploring different mindfulness strategies. Applying the results of my research to further inform my design criteria. Developing a prototype case for my mindful moment timer. Using and manipulating shapes and clipart by using computer-aided design (CAD), to produce a logo. Following a list of design requirements.
	Make	Developing a prototype case for my mindful moment timer. Creating 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	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.
Declarative (sticky) Knowledge	**Technical**	To understand what variables are in programming. To know some of the features of a Micro:bit. To know that an algorithm is a set of instructions to be followed by the computer. To know that it is important to check my code for errors (bugs). To know that a simulator can be used as a way of checking your code works before installing it onto an electronic device.
	Additional	To understand the terms 'ergonomic' and 'aesthetic'. To know that a prototype is a 3D model made out of cheap materials, that allows us to test design ideas and make better decisions about size, shape and materials.

LESSON OVERVIEWS

Digital World By the end of this block you will have achieved the following **National Curriculum outcomes**	♦ Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups. ♦ Investigate and analyse a range of existing products ♦ Evaluate their ideas and products against their design criteria and consider the views of others to improve their work ♦ To apply their understanding of computing to program, monitor and control their products ♦ Select from and use a wider range of tools and equipment Items and objects which are needed to complete a task. to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately ♦ Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design
Session 1 	LO: To create a design criteria for an electronic timer based on analysis of existing products ♦ I can write design criteria for a programmed timer (Micro:bit) ♦ I can investigate and analyse a range of timers by identifying and comparing their advantages and disadvantages ♦ I can apply the results of my research to further inform my design criteria ♦ I can explore different mindfulness strategies
Session 2 	LO: To apply understanding of computer programming to instruct and control a Micro:bit to function as a timer ♦ I can program a micro:bit in the Microsoft micro:bit editor, to time a set number of seconds/minutes upon button press ♦ I can test my program for bugs (errors in the code) ♦ I can find and fix the bugs (debug) in my code ♦ I can evaluate my micro:bit program against points on my design criteria and amend them to include any changes I made
Session 3 	LO: To design, make and develop a prototype case for my mindful moment timer ♦ I can develop a prototype case for my mindful moment timer ♦ I can create a 3D structure using a net ♦ I can document and evaluate my mindful moment timer project
Session 4 	LO: To design a logo for a mindfulness company using computer-aided design. ♦ I can use and manipulate shapes and clipart, using computer-aided design, to produce a logo. ♦ I understand what a logo is and why they are important in the world of design and business. ♦ I can follow a list of design requirements.