DESIGN AND TECHNOLOGY

"All things are possible..."

At Benedict Biscop we want our children to learn that all things are possible. We want our children to aspire and to achieve highly. We want our children to grow as designers, developing D&T knowledge and skills.

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.

We believe that design and technology should develop children with the following **essential characteristics** to help them become designers:

- The ability to carry out **research** and **ask questions** to develop knowledge of users' needs.
- A **knowledge of technological** innovations in materials, products and systems
- A **knowledge of which tools, equipment and materials** to use to make their products.
- The ability to **apply mathematical knowledge** when designing and making.
- Levels of originality and the willingness to take **creative** risks to produce innovative ideas
- The ability to use time efficiently and work constructively and productively **with others.**
- The ability to act as **responsible designers** and makers, working ethically, using finite materials carefully and working safely.
- The ability to **manage risks** exceptionally well to manufacture products safely and hygienically.
- A **passion** for the subject

We have developed our curriculum working alongside the Design and Technology Association [DATA], incorporating statutory and non-statutory guidance such as the EYFS Statutory Framework, Development Matters and the National Curriculum to support our curriculum development.

Where Does It Start?

Our pupils begin their Design and Technology journey at Benedict Biscop in our Early Years environment. Our provision has been carefully created, to provide a range of opportunities both indoor and outdoor to help develop their knowledge and skills.

EYFS Statutory Framework – Expressive Art and Design states:

The development of children's artistic and cultural awareness supports their imagination and creativity. It is important that children have regular opportunities to engage with the arts, enabling them to explore and play with a wide range of media and materials. The quality and variety of what children see, hear and participate in is crucial for developing their understanding, self-expression, vocabulary and ability to communicate through the arts. The frequency, repetition and depth of their experiences are fundamental to their progress in interpreting and appreciating what they hear, respond to and observe.

Outcomes in Early Years:

Early Learning Goals: **Creating with Materials**
Children at the expected level of development will: -Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function; - Share their creations, explaining the process they have used;

Development Matters progression related to Design and Technology:

Birth to Three	Three to Four	Reception
Expressive Art and Design -Explore different materials, using all their senses to investigate them. -Manipulate and play with different materials. -Use their imagination as they consider what they can do with different materials. -Make simple models, which express their ideas. **Physical** -Build independently with a range of appropriate resources. -Develop manipulation and control. -Explore different materials and tools.	**Expressive Art and Design** -Make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park. -Explore different materials freely, in order to develop their ideas about how to use them and what to make. -Develop their own ideas and then decide which materials to use to express them. -Join different materials and explore different textures. **Physical** -Use one-handed tools and equipment, for example, making snips in paper with scissors. -Show a preference for a dominant hand.	**Expressive Art and Design** -Return to and build on their previous learning, refining ideas and developing their ability to represent them. -Create collaboratively sharing ideas, resources, and skills. **Physical** -Develop their small motor skills so that they can use a range of tools competently, safely, and confidently. Suggested tools: pencils for drawing and writing, paintbrushes, scissors, knives, forks, and spoons.

In Key Stage 1 & 2, we actively encouraging cross-curricular learning through our themed based curriculum, allowing children to be fully immersed in their learning in order to meet the aims of the national curriculum and develop those essential characteristics of designers.

Key Stage 1 coverage:

Design

- 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

Make

- 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

- explore and evaluate a range of existing products
- evaluate their ideas and products against design criteria

Technical knowledge

- 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

Key Stage 2 coverage:

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in a process of designing and making. When designing and making, pupils should be taught to:

Design

- 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

Make

- 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

- 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

Technical knowledge

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

PROGRESSION

To meet our curriculum aims, we have identified core strands of learning [generic learning objectives] which run throughout our curriculum. With support from the **Design and Technology Association**, we have identified what this should look like at the end of key phases within the school [key skills demonstrated].
The curriculum is taught in a spiral design where learning is revisited and embedded – deepening learning and developing Mastery.

To ensure a balance of curriculum coverage we have mapped long term overview to ensure a broad range is covered and revisited in KS1 and KS2. In Early Years we have continuous provision set up to ensure pupils have the opportunity to learn across the curriculum at all times. We have a specific focus' each term, which are outlined in our term on term objectives.

	Autumn	Spring	Summer
Year One	**Textiles** **Design brief**: to design and make a 3D fabric Christmas decoration.	**Mechanisms [sliders and levers]** **Design brief**: to design and create a moving information display.	**Cooking and Nutrition** **Design brief**: to create a food item to take on a beach picnic
Year Two	**Mechanisms** **Design brief**: to design a vehicle to transport water	**Structures** **Design brief**: to design and make a bug hotel	**Cooking and Nutrition** **Design brief**: to design a healthy and nutritious meal to be consumed on an aeroplane.
Year Three	**Cooking and Nutrition** **Design brief**: to create alternative recipes for different dietary needs	**Textiles** **Design brief**: to design and create a fabric items you may need by the river	**Mechanisms [sliders and levers]** **Design brief**: to design and create a moving celebration card
Year Four	**Structures** **Design brief**: to design a new outdoor structure for leisure	**Structures** **Design brief**: To design and create a bridge	**Cooking and Nutrition** **Design brief**: To create a baked snack suitable for 3 different lifestyles.
Year Five	**Structures** Design brief: to design and make a tensile fabric structure for a warm climate	**Cooking and Nutrition/CAD** **Design brief**: to design and create food packaging	**Control** Design brief: To design and make an alarm for a person and problem of your choice
Year Six	**Textiles** Design brief: to design and create a fabric item to carry objects a refugee would take with them	**Mechanisms [mechanical systems and pulleys] and Electronics** Design brief: to design and create a rescue mechanism	**Mechanisms and Electronics** Design brief: to design and make an electric car

Termly Focus:

NURSERY

Autumn Term	Spring Term	Summer Term
Each term focuses on a different focus area/material, however staff may change order based on pupil interest. **DESIGN** -To select ingredients **MAKE** - To transform materials - To mix ingredients using bowl and spoon **TECHNICAL KNOWLEDGE** - To describe product made using technical vocabulary e.g. sweet, sour **EVALUATE** - To observe changes in ingredients when mixed	Each term focuses on a different focus area/material, however staff may change order based on pupil interest. **DESIGN** -Choose colours and shapes to make objects **MAKE** -Make 2D and 3D models -Use a range of joining materials **TECHNICAL KNOWLEDGE** -To know properties of different joining materials **EVALUATE** -Describe if they are happy with their product	Each term focuses on a different focus area/material, however staff may change order based on pupil interest. **DESIGN** To plan the shape of finished item **MAKE** -Add colour to mouldable materials -Use tools to sculpt **TECHNICAL KNOWLEDGE** -Know some materials can be moulded **EVALUATE** -Describe if they are happy with their product

RECEPTION

Autumn Term	Spring Term	Summer Term
Each term focuses on a different focus area/material, however staff may change order based on pupil interest. **DESIGN** -To decide what ingredients they will use for a specific product **MAKE** -To combine flavours/ingredients to make a baked item **TECHNICAL KNOWLEDGE** -To begin to know how to use a vary of cooking utensils -To learn different skills including: chopping, cutting and baking skills **EVALUATE** -To know that their design may need to change	Each term focuses on a different focus area/material, however staff may change order based on pupil interest. **DESIGN** -To design a product based on inspiration from real life **MAKE** - To select colours to represent different parts of a product - To use joining materials of different strengths **TECHNICAL KNOWLEDGE** -To know how to combine different materials **EVALUATE** -Evaluate their product using words such as strong and weak	Each term focuses on a different focus area/material, however staff may change order based on pupil interest. **DESIGN** -To design a product based on inspiration from real life or imagination **MAKE** -To mould materials into different shapes -To add colour to mouldable materials **TECHNICAL KNOWLEDGE** -To know tools that are used to sculpt **EVALUATE** -Change designs to improve them

Year 1 Autumn Term		**Textiles** **Design brief**: to design and make a 3D fabric Christmas decoration.	
AIMS:	**Objectives** **Children should learn to:**	**KS1 EXPECTATIONS**	**YEAR 1 EXPECTATIONS**
To DESIGN products	To design fabric Christmas decorations for different intended users.	**PDA 1** - work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment **PDA 2** - state what products they are designing and making **PDA 3** - say whether their products are for themselves or other users **PDA 6** - say how they will make their products suitable for their intended users **PDA 7** - use simple design criteria to help develop their ideas **PDB 1** - generate ideas by drawing on their own experiences **PDB 2** - use knowledge of existing products to help come up with ideas **PDB 3** - develop and communicate ideas by talking and drawing **PDB 4** - model ideas by exploring materials, components and construction kits and by making templates and mockups	I can: ✓ state what product they are designing and making ✓ explain who the product is for ✓ use an existing mood board/ideas page to take inspiration ✓ model/draw/talk about simple design ideas drawing on my own experience and knowledge of existing products ✓ complete basic labelling of design ideas with design features e.g. colour choice, illustrate direction of movement, theme. ✓ use ICT to develop their ideas
To MAKE products	To make a fabric Christmas decoration	**PMA 1** - plan by suggesting what to do next **PMA 3** - select from a range of materials and components according to their characteristics **PMB 1** - follow procedures for safety and hygiene **PMB 2** - use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components **PMB 3** - measure, mark out, cut and shape materials and components **PMB 4** - assemble, join and combine materials and components	I can: ✓ plan by suggesting what to do next ✓ select from a range of tools and equipment. ✓ select from a range of materials and components according to their characteristic ✓ list some of the stages of making ✓ explain what I'm making and why ✓ select tools/equipment to cut, shape, join, finish and explain choices ✓ measure, mark out, cut and shape, with support ✓ choose suitable materials and explain my choices ✓ try to use finishing techniques to make product look good
To EVALUATE products	To evaluate different fabric Christmas decorations. To evaluate how the making process when and what things they would do to improve their finished product	**PEA 1** - talk about their design ideas and what they are making **PEA 2**- make simple judgements about their products and ideas against design criteria **PEA 3** - suggest how their products could be improved **PEB 1** - what products are **PEB 2** - who products are for **PEB 3** - what products are for **PEB 7** - what materials products are made from **PEB 8** - what they like and dislike about products	I can: ✓ describe what I like and dislike about my own design ideas and what I am making. ✓ begin to talk about changes made during the making process ✓ begin to evaluate existing products saying what I like and dislike about them.

To develop TECHNICAL KNOWLEDGE	To learn about different fabrics and their characteristics. To learn different textile joining techniques. To know how to create a simple 3-D textile shape.	**PTK 1** - about the simple working characteristics of materials and components **PTK 4** - that a 3-D textiles product can be assembled from two identical fabric shapes **PTK 6** - the correct technical vocabulary for the projects they are undertaking	TEXTILES I can: ✓ measure, cut and join textiles to make a product, with some support ✓ choose suitable textiles

Year 1 Spring Term		**Mechanisms [sliders and levers]** **Design brief: to design and create a moving information display.**	
AIMS:	**Objectives** **Children should learn to:**	**KS1 EXPECTATIONS**	**YEAR 1 EXPECTATIONS**
To DESIGN products	To design a moving sign.	**PDA 1** - work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment **PDA 2** - state what products they are designing and making **PDA 3** - say whether their products are for themselves or other users **PDA 4** - describe what their products are for **PDA 5** - say how their products will work **PDA 6** - say how they will make their products suitable for their intended users **PDA 7** - use simple design criteria to help develop their ideas **PDB 1** - generate ideas by drawing on their own experiences **PDB 2** - use knowledge of existing products to help come up with ideas **PDB 3** - develop and communicate ideas by talking and drawing **PDB 4** - model ideas by exploring materials, components and construction kits and by making templates and mockups **PDB 5** - use information and communication technology, where appropriate, to develop and communicate their ideas	I can: ✓ state what product they are designing and making ✓ explain who the product is for ✓ use an existing mood board/ideas page to take inspiration ✓ model/draw/talk about simple design ideas drawing on my own experience and knowledge of existing products ✓ complete basic labelling of design ideas with design features e.g. colour choice, illustrate direction of movement, theme. ✓ use ICT to develop their ideas
To MAKE products	To make a range of sliders and levers. To make a mock-up/prototype of their moving display.	**PMA 1** - plan by suggesting what to do next **PMA 2** - select from a range of tools and equipment, explaining their choices **PMA 3** - select from a range of materials and components according to their characteristics **PMB 1** - follow procedures for safety and hygiene **PMB 2** - use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components **PMB 3** - measure, mark out, cut and shape materials and components **PMB 4** - assemble, join and combine materials and components **PMB 5** - use finishing techniques, including those from art and design	I can: ✓ plan by suggesting what to do next ✓ select from a range of tools and equipment. ✓ select from a range of materials and components according to their characteristic ✓ list some of the stages of making ✓ explain what I'm making and why ✓ select tools/equipment to cut, shape, join, finish and explain choices

			✓ measure, mark out, cut and shape, with support ✓ choose suitable materials and explain my choices ✓ try to use finishing techniques to make product look good
To EVALUATE products	To explore a range of sliders and levers.	**PEA 1** - talk about their design ideas and what they are making **PEA 2**- make simple judgements about their products and ideas against design criteria **PEA 3** - suggest how their products could be improved **PEB 1** - what products are **PEB 2** - who products are for **PEB 3** - what products are for **PEB 4** - how products work **PEB 5** - how products are used **PEB 6** - where products might be used **PEB 7** - what materials products are made from **PEB 8** - what they like and dislike about products	I can: ✓ describe what I like and dislike about my own design ideas and what I am making. ✓ begin to talk about changes made during the making process ✓ begin to evaluate existing products saying what I like and dislike about them.
To develop TECHNICAL KNOWLEDGE	To develop a knowledge of sliders and levers.	**PTK 2** - about the movement of simple mechanisms such as levers, sliders, wheels and axles **PTK 6** - the correct technical vocabulary for the projects they are undertaking	MECHANISMS I can: ✓ recognise a simple lever, slider/wheel, axles ✓ use the terms 'levers', 'pivots'/ 'wheels', 'axles' ✓ identify the direction of movement in a mechanism ✓ begin to investigate different ways of making mechanisms ✓ with support, understand how to create a movement e.g. sliding, turning ✓ create simple movements (up, down, along, and around) ✓ create simple mechanisms to make a moving model

Year 1 Summer Term		**Cooking and Nutrition** **Design brief: to create a food item to take on a beach picnic**	
AIMS:	**Objectives** **Children should learn to:**	**KS1 EXPECTATIONS**	**YEAR 1 EXPECTATIONS**
To DESIGN products	To design a moving sign.	**PDA 1** - work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment **PDA 2** - state what products they are designing and making **PDA 3** - say whether their products are for themselves or other users **PDA 4** - describe what their products are for **PDA 5** - say how their products will work **PDA 6** - say how they will make their products suitable for their intended users **PDA 7** - use simple design criteria to help develop their ideas **PDB 1** - generate ideas by drawing on their own experiences **PDB 2** - use knowledge of existing products to help come up with ideas **PDB 3** - develop and communicate ideas by talking and drawing **PDB 4** - model ideas by exploring materials, components and construction kits and by making templates and mockups **PDB 5** - use information and communication technology, where appropriate, to develop and communicate their ideas	I can: ✓ state what product they are designing and making ✓ explain who the product is for ✓ use an existing mood board/ideas page to take inspiration ✓ model/draw/talk about simple design ideas drawing on my own experience and knowledge of existing products ✓ complete basic labelling of design ideas with design features e.g. colour choice, illustrate direction of movement, theme. ✓ use ICT to develop their ideas
To MAKE products	To make a range of sliders and levers. To make a mock-up/prototype of their moving display.	**PMA 1** - plan by suggesting what to do next **PMA 2** - select from a range of tools and equipment, explaining their choices **PMA 3** - select from a range of materials and components according to their characteristics **PMB 1** - follow procedures for safety and hygiene **PMB 2** - use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components **PMB 3** - measure, mark out, cut and shape materials and components **PMB 4** - assemble, join and combine materials and components **PMB 5** - use finishing techniques, including those from art and design	I can: ✓ plan by suggesting what to do next ✓ select from a range of tools and equipment. ✓ select from a range of materials and components according to their characteristic ✓ list some of the stages of making ✓ explain what I'm making and why ✓ select tools/equipment to cut, shape, join, finish and explain choices ✓ measure, mark out, cut and shape, with support ✓ choose suitable materials and explain my choices ✓ try to use finishing techniques to make product look good

To EVALUATE products	To explore a range of sliders and levers.	**PEA 1** - talk about their design ideas and what they are making **PEA 2**- make simple judgements about their products and ideas against design criteria **PEA 3** - suggest how their products could be improved **PEB 1** - what products are **PEB 2** - who products are for **PEB 3** - what products are for **PEB 4** - how products work **PEB 5** - how products are used **PEB 6** - where products might be used **PEB 7** - what materials products are made from **PEB 8** - what they like and dislike about products	I can: ✓ describe what I like and dislike about my own design ideas and what I am making. ✓ begin to talk about changes made during the making process ✓ begin to evaluate existing products saying what I like and dislike about them.
To develop TECHNICAL KNOWLEDGE	To develop a knowledge of sliders and levers.	**PTK 2** - about the movement of simple mechanisms such as levers, sliders, wheels and axles **PTK 6** - the correct technical vocabulary for the projects they are undertaking	MECHANISMS I can: ✓ recognise a simple lever, slider/wheel, axles ✓ use the terms 'levers', 'pivots'/ 'wheels', 'axles' ✓ identify the direction of movement in a mechanism ✓ begin to investigate different ways of making mechanisms ✓ with support, understand how to create a movement e.g. sliding, turning ✓ create simple movements (up, down, along, and around) ✓ create simple mechanisms to make a moving model

Year 2 Autumn Term		**Mechanisms** **Design brief**: to design a vehicle to transport water	
AIMS:	**Objectives** **Children should learn to:**	**KS1 EXPECTATIONS**	**YEAR 2 EXPECTATIONS**
To DESIGN products	To design a moving product to transport water during the Great Fire.	**PDA 1** - work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment **PDA 2** - state what products they are designing and making **PDA 3** - say whether their products are for themselves or other users **PDA 4** - describe what their products are for **PDA 5** - say how their products will work **PDA 6** - say how they will make their products suitable for their intended users **PDA 7** - use simple design criteria to help develop their ideas **PDB 1** - generate ideas by drawing on their own experiences **PDB 2** - use knowledge of existing products to help come up with ideas **PDB 3** - develop and communicate ideas by talking and drawing	I can: ✓ describe what product they are ✓ designing and making ✓ describe what the product is for and how it will work ✓ explain how I can make my product suitable for an intended user ✓ produce a basic mood board/ideas page using readily available images, with support ✓ model/draw/talk about a range of simple design ideas drawing on my own experience and knowledge of existing products ✓ label design ideas based on design brief e.g. colour choice, direction of movement, theme, how it will appeal to the intended user ✓ use ICT to develop and communicate my ideas
To MAKE products	To make their product [vehicle to transport water]	**PMA 1** - plan by suggesting what to do next **PMA 2** - select from a range of tools and equipment, explaining their choices **PMA 3** - select from a range of materials and components according to their characteristics **PMB 1** - follow procedures for safety and hygiene **PMB 2** - use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components **PMB 3** - measure, mark out, cut and shape materials and components **PMB 4** - assemble, join and combine materials and components **PMB 5** - use finishing techniques, including those from art and design	I can: ✓ plan by suggesting what to do next ✓ select from a range of tools and equipment, explaining their choices. ✓ select from a range of materials and components according to their characteristic ✓ Begin to order main stages of making ✓ explain what I am making and why it fits the purpose ✓ join materials/components together in different ways ✓ measure, mark out, cut and shape materials and components, with support. ✓ describe which tools I'm using and why ✓ choose suitable materials and explain choices depending on characteristic ✓ use finishing techniques to make product look good
To EVALUATE products	To explore different products that are used today to help put out fires. To explore and evaluate mechanisms and materials to inform their designing.	**PEA 1** - talk about their design ideas and what they are making **PEA 2**- make simple judgements about their products and ideas against design criteria **PEA 3** - suggest how their products could be improved **PEB 1** - what products are **PEB 2** - who products are for **PEB 3** - what products are for **PEB 4** - how products work **PEB 5** - how products are used **PEB 6** - where products might be used **PEB 7** - what materials products are made from **PEB 8** - what they like and dislike about products	I can: ✓ describe what I like and dislike about my own design ideas and what I am making. ✓ provide a suggestion of how the final product could be further improved ✓ talk about changes made during the making process ✓ evaluate existing products i.e. what products are, who they are for, what they are for, how they work, when they are used, where they might be used and the materials they are made from

To develop TECHNICAL KNOWLEDGE	To learn about the movement of simple mechanisms such as wheels and axis	**PTK 1** - about the simple working characteristics of materials and components **PTK 2** - about the movement of simple mechanisms such as levers, sliders, wheels and axles **PTK 6** - the correct technical vocabulary for the projects they are undertaking	MECHANISMS I can: ✓ identify a lever, linkage, pivot, wheel, axles, frame and describe each purpose *(understands that a lever turns on a pivot, understands that a linkage is a system of levers that are connected by pivots* ✓ identify the direction of movement of some basic mechanisms ✓ provide an example of a product that contains a mechanism ✓ create a moving prototype by making a mechanism ✓ begin to experiment adjusting the widths, lengths and thicknesses used

Year 2 Spring Term		**Structures** **Design brief**: to design and make a bug hotel	
AIMS:	**Objectives** **Children should learn to:**	**KS1 EXPECTATIONS**	**YEAR 2 EXPECTATIONS**
To DESIGN products	To design a bug hotel. To plan how they will make their design.	**PDA 1** - work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment **PDA 2** - state what products they are designing and making **PDA 3** - say whether their products are for themselves or other users **PDA 4** - describe what their products are for **PDA 5** - say how their products will work **PDA 6** - say how they will make their products suitable for their intended users **PDA 7** - use simple design criteria to help develop their ideas **PDB 1** - generate ideas by drawing on their own experiences **PDB 2** - use knowledge of existing products to help come up with ideas **PDB 3** - develop and communicate ideas by talking and drawing	I can: ✓ describe what product they are ✓ designing and making ✓ describe what the product is for and how it will work ✓ explain how I can make my product suitable for an intended user ✓ produce a basic mood board/ideas page using readily available images, with support ✓ model/draw/talk about a range of simple design ideas drawing on my own experience and knowledge of existing products ✓ label design ideas based on design brief e.g. colour choice, direction of movement, theme, how it will appeal to the intended users ✓ use ICT to develop and communicate my ideas
To MAKE products	To make a bug hotel.	**PMA 1** - plan by suggesting what to do next **PMA 2** - select from a range of tools and equipment, explaining their choices **PMA 3** - select from a range of materials and components according to their characteristics **PMB 1** - follow procedures for safety and hygiene **PMB 2** - use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components **PMB 3** - measure, mark out, cut and shape materials and components **PMB 4** - assemble, join and combine materials and components **PMB 5** - use finishing techniques, including those from art and design	I can: ✓ plan by suggesting what to do next ✓ select from a range of tools and equipment, explaining their choices. ✓ select from a range of materials and components according to their characteristic ✓ Begin to order main stages of making explain what I am making and why it fits the purpose ✓ join materials/components together in different ways measure, mark out, cut and shape materials and components, with support. ✓ describe which tools I'm using and why choose suitable materials and explain choices depending on characteristic ✓ use finishing techniques to make product look good
To EVALUATE products	To explore a range of bug hotel designs.	**PEA 1** - talk about their design ideas and what they are making **PEA 2**- make simple judgements about their products and ideas against design criteria **PEA 3** - suggest how their products could be improved **PEB 1** - what products are	I can: ✓ describe what I like and dislike about my own design ideas and what I am making.

	To evaluate their finished product design	**PEB 2** - who products are for **PEB 3** - what products are for **PEB 4** - how products work **PEB 6** - where products might be used **PEB 7** - what materials products are made from **PEB 8** - what they like and dislike about products	✓ provide a suggestion of how the final product could be further improved ✓ talk about changes made during the making process ✓ evaluate existing products i.e. what products are, who they are for, what they are for, how they work, when they are used, where they might be used and the materials they are made from
To develop TECHNICAL KNOWLEDGE	To know what bug hotels are and how they work. To learn different techniques to make structures stronger, stiffer and more stable. To learn different assembly techniques.	**PTK 1** - about the simple working characteristics of materials and components **PTK 3** - how freestanding structures can be made stronger, stiffer and more stable **PTK 6** - the correct technical vocabulary for the projects they are undertaking	STRUCTURES I can: ✓ create joints and structures from basic materials ✓ explore the features of structures ✓ compare the stability of different shapes ✓ test the strength of their prototype ✓ start to identify the strongest and weakest part of a structure *(e.g. the back of the lever moves – could add a guide to strengthen)*

Year 2 Summer Term		**Cooking and Nutrition** **Design brief**: to design a healthy and nutritious meal to be consumed on an aeroplane.	
AIMS:	**Objectives** **Children should learn to:**	**KS1 EXPECTATIONS**	**YEAR 2 EXPECTATIONS**
To DESIGN products	To design a meal that could be taken and eaten on a plan.	**PDA 1** - work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment **PDA 2** - state what products they are designing and making **PDA 3** - say whether their products are for themselves or other users **PDA 4** - describe what their products are for **PDA 6** - say how they will make their products suitable for their intended users **PDA 7** - use simple design criteria to help develop their ideas **PDB 1** - generate ideas by drawing on their own experiences **PDB 2** - use knowledge of existing products to help come up with ideas **PDB 3** - develop and communicate ideas by talking and drawing	I can: ✓ describe what product they are ✓ designing and making ✓ describe what the product is for and how it will work ✓ explain how I can make my product suitable for an intended user ✓ produce a basic mood board/ideas page using readily available images, with support ✓ model/draw/talk about a range of simple design ideas drawing on my own experience and knowledge of existing products ✓ label design ideas based on design brief e.g. colour choice, direction of movement, theme, how it will appeal to the intended user ✓ use ICT to develop and communicate my ideas

To MAKE products	To practice different techniques safely and hygienically [such as cutting, peeling, grating, spreading]. To make part of their meal.	**PMA 2** - select from a range of tools and equipment, explaining their choices **PMA 3** - select from a range of materials and components according to their characteristics **PMB 1** - follow procedures for safety and hygiene **PMB 2** - use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components	I can: ✓ plan by suggesting what to do next ✓ select from a range of tools and equipment, explaining their choices. ✓ select from a range of materials and components according to their characteristic ✓ Begin to order main stages of making ✓ explain what I am making and why it fits the purpose ✓ join materials/components together in different ways ✓ measure, mark out, cut and shape materials and components, with support. ✓ describe which tools I'm using and why ✓ choose suitable materials and explain choices depending on characteristic ✓ use finishing techniques to make product look good
To EVALUATE products	To make part of their meal, evaluating during the making process	**PEA 1** - talk about their design ideas and what they are making **PEA 2**- make simple judgements about their products and ideas against design criteria **PEA 3** - suggest how their products could be improved **PEB 1** - what products are **PEB 2** - who products are for **PEB 3** - what products are for **PEB 5** - how products are used **PEB 6** - where products might be used **PEB 7** - what materials products are made from **PEB 8** - what they like and dislike about products	I can: ✓ describe what I like and dislike about my own design ideas and what I am making. ✓ provide a suggestion of how the final product could be further improved ✓ talk about changes made during the making process ✓ evaluate existing products i.e. what products are, who they are for, what they are for, how they work, when they are used, where they might be used and the materials they are made from
To develop TECHNICAL KNOWLEDGE	To name and sort foods into the five groups in the eat well plate	**PTK 5** - that food ingredients should be combined according to their sensory characteristics **PTK 6** - the correct technical vocabulary for the projects they are undertaking **PCNA 1** - that all food comes from plants or animals **PCNA 2** - that food has to be farmed, grown elsewhere (e.g. home) or caught	COOKING AND NUTRITION I can: ✓ explain what hygiene is and how to keep a hygienic surface ✓ describe properties of ingredients and importance of varied diet ✓ say where food comes from ✓ (animal, underground etc.) ✓ describe how food is farmed, home-grown, caugh ✓ draw eat well plate; explain there are groups of food ✓ describe "five a day" ✓ cut, peel and grate with increasing confidence

Year 3 Autumn Term		**<u>Cooking and Nutrition</u>** **Design brief**: to create alternative recipes for different dietary needs	
AIMS:	**Objectives** **Children should learn to:**	**KS2 EXPECTATIONS**	**YEAR 3 EXPECTATIONS**
To DESIGN products	To think about what they would need to consider if making a product for a particular need. To design a baked product for a dietary need.	**PDA 8** - gather information about the needs and wants of particular individuals and groups **PDA 9** - develop their own design criteria and use these to inform their idea **PDA 14** - describe the purpose of their products **PDA 15** - indicate the design features of their products that will appeal to intended users **PDB 6** - generate realistic ideas, focusing on the needs of the user **PDB 10** - share and clarify ideas through discussion **PDB 12** - use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas	I can: ✓ gather basic information about the needs and wants of particular individuals or groups ✓ develop a basic design criteria based on the design brief ✓ describe the purpose of my product ✓ produce a mood board/ideas page to represent the theme of the design brief using my own ideas ✓ model/draw/talk a range of realistic design ideas focusing on the needs of the user. ✓ Label all design ideas with design features e.g. colour choice, how particular part of their products work, direction of movement, theme, reference to material, can describe the purpose of the product and how it will appeal to its intended user
To MAKE products	To make a baked product.	**PMA 4** - order the main stages of making **PMA 7** - select tools and equipment suitable for the task **PMA 8** - explain their choice of tools and equipment in relation to the skills and techniques they will be using **PMB 6** - measure, mark out, cut and shape materials and components with some accuracy **PMB 7** - assemble, join and combine materials and components with some accuracy **PMB 14** - follow procedures for safety and hygiene **PMB 15** - use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components	I can: ✓ begin to order main stages of making [may be some errors in sequencing] ✓ select tools and equipment suitable for the task. ✓ select materials and components suitable for the task.
To EVALUATE products	To explore different products for a particular dietary need. To identify what products might be suitable to include in their design.	**PEA 4** - refer to their design criteria as they design and make **PEA 5** - use their design criteria to evaluate their completed products **PEA 8** - identify the strengths and areas for development in their ideas and products **PEA 9** - consider the views of others, including intended users, to improve their work **PEB 9** - who designed and made the products **PEB 10** - where products were designed and made **PEB 11** - when products were designed and made **PEB 17** - how well products have been designed **PEB 18** - how well products have been made	I can: ✓ identify both good and bad features of my final practical outcome and provide a suggestion to further improve it. ✓ provide a basic reference to some of the specification points against final prototype ✓ select suitable tools/equipment, explain choices; begin to use them accurately ✓ select appropriate materials, fit for purpose. ✓ begin to measure, mark out, cut and shape materials/components with some accuracy

		PEB 23 - how well products meet user needs and wants	✓ begin to assemble, join and combine materials and components with some accuracy ✓ begin to apply a range of finishing techniques with some accuracy
To develop TECHNICAL KNOWLEDGE	To know that some people have different dietary needs and how this impacts what products they buy. To know about chefs who have developed products to meet different dietary needs. To know how to use different cooking techniques safely and hygienically.	**PTK 12** - that food ingredients can be fresh, pre-cooked and processed **PTK 19** - how to use learning from science to help design and make products that work **PTK 20** - how to use learning from mathematics to help design and make products that work **PTK 24** - the correct technical vocabulary for the projects they are undertaking **PCNA 5** - that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world	COOKING AND NUTRITION I can: ✓ carefully select ingredients ✓ use equipment safely ✓ make products look attractive ✓ think about how to grow plants to use in cooking ✓ describe how healthy diet= variety/balance of food/drinks ✓ explain how food and drink are needed for active/healthy bodies. ✓ prepare and cook some dishes safely and hygienically ✓ Use, more confidently, some of the following techniques: peeling, chopping, slicing, grating, mixing, spreading, kneading and baking

Year 3 Spring Term		**Textiles** **Design brief**: to design and create a fabric items you may need by the river	
AIMS:	**Objectives** **Children should learn to:**	**KS2 EXPECTATIONS**	**YEAR 3 EXPECTATIONS**
To DESIGN products	To design an item that would be useful by the river.	**PDA 8** - gather information about the needs and wants of particular individuals and groups **PDA 9** - develop their own design criteria and use these to inform their idea **PDA13** - work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment **PDA 14** - describe the purpose of their products **PDA 15** - indicate the design features of their products that will appeal to intended users **PDA 16** - explain how particular parts of their products work **PDB 6** - generate realistic ideas, focusing on the needs of the user **PDB 7** - make design decisions that take account of the availability of resources **PDB 10** - share and clarify ideas through discussion **PDB 11** - model their ideas using prototypes and pattern pieces **PDB 12** - use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas	I can: ✓ gather basic information about the needs and wants of particular individuals or groups ✓ develop a basic design criteria based on the design brief ✓ describe the purpose of my product ✓ produce a mood board/ideas page to represent the theme of the design brief using my own ideas ✓ model/draw/talk a range of realistic design ideas focusing on the needs of the user. ✓ Label all design ideas with design features e.g. colour choice, how particular part of their products work, direction of movement, theme, reference to material, can describe the purpose of the product and how it will appeal to its intended user
To MAKE products	To make their product.	**PMA 4** - order the main stages of making **PMA 7** - select tools and equipment suitable for the task **PMA 8** - explain their choice of tools and equipment in relation to the skills and	I can: ✓ begin to order main stages of making [may be some errors in sequencing]

		techniques they will be using **PMA 9** - select materials and components suitable for the task **PMA 10** - explain their choice of materials and components according to functional properties and aesthetic qualities **PMB 6** - measure, mark out, cut and shape materials and components with some accuracy **PMB 7** - assemble, join and combine materials and components with some accuracy **PMB 8** - apply a range of finishing techniques, including those from **PMB 14** - follow procedures for safety and hygiene **PMB 15** - use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components	✓ select tools and equipment suitable for the task. ✓ select materials and components suitable for the task.
To EVALUATE products	To explore different waterproof fabric items. To describe how they made their product. To evaluate their product.	**PEA 4** - refer to their design criteria as they design and make **PEA 5** - use their design criteria to evaluate their completed products **PEA 8** - identify the strengths and areas for development in their ideas and products **PEB 9** - who designed and made the products **PEB 10** - where products were designed and made **PEB 11** - when products were designed and made **PEB 12** - whether products can be recycled or reused **PEB 17** - how well products have been designed **PEB 18** - how well products have been made **PEB 19** - why materials have been chosen **PEB 20** - what methods of construction have been used **PEB 21** - how well products work **PEB 22** - how well products achieve their purposes **PEB 23** - how well products meet user needs and wants	I can: ✓ identify both good and bad features of my final practical outcome and provide a suggestion to further improve it. ✓ provide a basic reference to some of the specification points against final prototype ✓ select suitable tools/equipment, explain choices; begin to use them accurately ✓ select appropriate materials, fit for purpose. ✓ begin to measure, mark out, cut and shape materials/components with some accuracy ✓ begin to assemble, join and combine materials and components with some accuracy ✓ begin to apply a range of finishing techniques with some accuracy
To develop TECHNICAL KNOWLEDGE	To know the properties of different fabrics. To learn different techniques to join fabrics.	**PTK 11** - that a single fabric shape can be used to make a 3D textiles product **PTK 12** - that food ingredients can be fresh, pre-cooked and processed **PTK 19** - how to use learning from science to help design and make products that work **PTK 21** - that materials have both functional properties and aesthetic qualities **PTK 22** - that materials can be combined and mixed to create more useful characteristics **PTK 24** - the correct technical vocabulary for the projects they are undertaking	TEXTILES I can: ✓ join different textiles in different ways ✓ choose textiles considering appearance and functionality

Year 3 Summer Term		**Mechanisms [sliders and levers]** **Design brief**: to design and create a moving celebration card	
AIMS:	**Objectives** **Children should learn to:**	**KS2 EXPECTATIONS**	**YEAR 3 EXPECTATIONS**
To DESIGN products	To design a moving card.	**PDA 9** - develop their own design criteria and use these to inform their idea **PDA13** - work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment **PDA 14** - describe the purpose of their products **PDA 15** - indicate the design features of their products that will appeal to intended users **PDA 16** - explain how particular parts of their products work **PDB 6** - generate realistic ideas, focusing on the needs of the user **PDB 7** - make design decisions that take account of the availability of resources **PDB 10** - share and clarify ideas through discussion **PDB 11** - model their ideas using prototypes and pattern pieces **PDB 12** - use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas	I can: ✓ gather basic information about the needs and wants of particular individuals or groups ✓ develop a basic design criteria based on the design brief ✓ describe the purpose of my product ✓ produce a mood board/ideas page to represent the theme of the design brief using my own ideas ✓ model/draw/talk a range of realistic design ideas focusing on the needs of the user. ✓ Label all design ideas with design features e.g. colour choice, how particular part of their products work, direction of movement, theme, reference to material, can describe the purpose of the product and how it will appeal to its intended user
To MAKE products	To make a moving card.	**PMA 4** - order the main stages of making **PMA 7** - select tools and equipment suitable for the task **PMA 8** - explain their choice of tools and equipment in relation to the skills and techniques they will be using **PMA 9** - select materials and components suitable for the task **PMA 10** - explain their choice of materials and components according to functional properties and aesthetic qualities **PMB 6** - measure, mark out, cut and shape materials and components with some accuracy **PMB 7** - assemble, join and combine materials and components with some accuracy **PMB 8** - apply a range of finishing techniques, including those from art and design, with some accuracy **PMB 14** - follow procedures for safety and hygiene	I can: ✓ begin to order main stages of making [may be some errors in sequencing] ✓ select tools and equipment suitable for the task. ✓ select materials and components suitable for the task.
To EVALUATE products	To explore how different levers work and are made. To describe how they made their card. To evaluate their finished product.	**PEA 4** - refer to their design criteria as they design and make **PEA 5** - use their design criteria to evaluate their completed products **PEA 8** - identify the strengths and areas for development in their ideas and products **PEA 9** - consider the views of others, including intended users, to improve their work **PEB 9** - who designed and made the products **PEB 12** - whether products can be recycled or reused **PEB 18** - how well products have been made **PEB 19** - why materials have been chosen	I can: ✓ identify both good and bad features of my final practical outcome and provide a suggestion to further improve it. ✓ provide a basic reference to some of the specification points against final prototype ✓ select suitable tools/equipment, explain choices; begin to use them accurately

		PEB 20 - what methods of construction have been used **PEB 21** - how well products work **PEB 22** - how well products achieve their purposes **PEB 23** - how well products meet user needs and wants	✓ select appropriate materials, fit for purpose. ✓ begin to measure, mark out, cut and shape materials/components with some accuracy ✓ begin to assemble, join and combine materials and components with some accuracy ✓ begin to apply a range of finishing techniques with some accuracy
To develop TECHNICAL KNOWLEDGE	To learn how different levers work and are made.	**PTK 7** - how mechanical systems such as levers and linkages or pneumatic systems create movement **PTK 20** - how to use learning from mathematics to help design and make products that work **PTK 21** - that materials have both functional properties and aesthetic qualities **PTK 22** - that materials can be combined and mixed to create more useful characteristics **PTK 24** - the correct technical vocabulary for the projects they are undertaking	MECHANISMS I can: ✓ provide some basic examples of mechanisms ✓ start to understand what a mechanical system is and the difference between a stand-alone mechanism and mechanical, beginning to connect simple mechanisms together ✓ say that mechanisms are a system of parts that work together to create movement ✓ say that there is an input and output in a mechanism (input is the motion used to start a mechanism. An output is the motion that happens as a result of starting the input) ✓ identify mechanisms ✓ in everyday objects

Year 4 Autumn Term		**Structures** **Design brief**: to design a new outdoor structure for leisure	
AIMS:	**Objectives** **Children should learn to:**	**KS2 EXPECTATIONS**	**YEAR 4 EXPECTATIONS**
To DESIGN products	To design an appropriate play structure for a playground in school.	**PDA 8** - gather information about the needs and wants of particular individuals and groups **PDA 9** - develop their own design criteria and use these to inform their idea **PDA13** - work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment **PDA 14** - describe the purpose of their products	I can: ✓ gather a range of information about the needs and wants of particular individuals or groups ✓ develop a design-criteria based on the design brief [e.g. aesthetics, size, function] ✓ indicate the design features that will appeal to an intended user

		PDA 15 - indicate the design features of their products that will appeal to intended users **PDA 16** - explain how particular parts of their products work **PDB 6** - generate realistic ideas, focusing on the needs of the user **PDB 7** - make design decisions that take account of the availability of resources **PDB 10** - share and clarify ideas through discussion **PDB 11** - model their ideas using prototypes and pattern pieces **PDB 12** - use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas	✓ produce a mood board/ideas page to represent the theme of the design brief using my own ideas ✓ model/draw/talk a range of realistic design ideas focusing on the needs of the user and taking account of the availability of resources. ✓ clarify ideas through discussion. ✓ label all design ideas with design features e.g. colour choice, how particular part of my products work, direction of movement, theme, material choice with justification, can clearly describe the purpose of the product and how it will appeal to its intended user
To MAKE products	To explore different playground structures.	**PMA 4** - order the main stages of making **PMA 7** - select tools and equipment suitable for the task **PMA 8** - explain their choice of tools and equipment in relation to the skills and techniques they will be using **PMA 9** - select materials and components suitable for the task **PMA 10** - explain their choice of materials and components according to functional properties and aesthetic qualities **PMB 6** - measure, mark out, cut and shape materials and components with some accuracy **PMB 7** - assemble, join and combine materials and components with some accuracy **PMB 15** - use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components	I can: ✓ order main stages of making accurately. ✓ select tools and equipment suitable for the task – explaining my choice in relation to the skills and techniques they will be using. ✓ select materials and components suitable for the task, explaining their choice. ✓ select suitable tools and equipment, explain choices in relation to required techniques and use accurately ✓ select appropriate materials, fit for purpose; explain choices ✓ measure, mark out, cut and shape materials/components with some accuracy ✓ assemble, join and combine materials and components with some accuracy ✓ apply a range of finishing techniques with some accuracy
To EVALUATE products	To evaluate different playground structures. To evaluate the design of a play structure.	**PEA 4** - refer to their design criteria as they design and make **PEA 8** - identify the strengths and areas for development in their ideas and products **PEA 9** - consider the views of others, including intended users, to improve their work **PEB 9** - who designed and made the products **PEB 19** - why materials have been chosen **PEB 21** - how well products work **PEB 22** - how well products achieve their purposes **PEB 23** - how well products meet user needs and wants	I can: ✓ refer to the design criteria to help shape the product, during makking. ✓ identify a range of strengths and areas to develop within my final outcome against most specification points ✓ take account the views of others to suggest ways to improve my work.
To develop TECHNICAL KNOWLEDGE	To learn techniques for building strong structures.	**PTK 10** - how to make strong, stiff shell structures **PTK 21** - that materials have both functional properties and aesthetic qualities **PTK 22** - that materials can be combined and mixed to create more useful characteristics	STRUCTURES I can: ✓ say that different shapes can strengthen and weaken structures and the materials can be manipulated to improve strength and stiffness ✓ design a stable structure that is able to support weight ✓ select appropriate materials to build a strong structure

			✓ Apply my knowledge and understanding that shapes and structures with wide, flat bases or legs are the most stable

Year 4 Spring Term		**Structures** **Design brief**: To design and create a bridge	
AIMS:	**Objectives** **Children should learn to:**	**KS2 EXPECTATIONS**	**YEAR 4 EXPECTATIONS**
To DESIGN products	To design a bridge.	**PDA 9** - develop their own design criteria and use these to inform their idea **PDA13** - work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment **PDA 14** - describe the purpose of their products **PDA 15** - indicate the design features of their products that will appeal to intended users **PDA 16** - explain how particular parts of their products work **PDB 6** - generate realistic ideas, focusing on the needs of the user **PDB 7** - make design decisions that take account of the availability of resources **PDB 10** - share and clarify ideas through discussion **PDB 11** - model their ideas using prototypes and pattern pieces **PDB 12** - use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas	I can: ✓ gather a range of information about the needs and wants of particular individuals or groups ✓ develop a design-criteria based on the design brief [e.g. aesthetics, size, function] ✓ indicate the design features that will appeal to an intended user ✓ produce a mood board/ideas page to represent the theme of the design brief using my own ideas ✓ model/draw/talk a range of realistic design ideas focusing on the needs of the user and taking account of the availability of resources. ✓ clarify ideas through discussion. ✓ label all design ideas with design features e.g. colour choice, how particular part of my products work, direction of movement, theme, material choice with justification, can clearly describe the purpose of the product and how it will appeal to its intended user
To MAKE products	To explore bridges. To make a bridge out of certain materials in a set time limit. To make a bridge.	**PMA 4** - order the main stages of making **PMA 7** - select tools and equipment suitable for the task **PMA 8** - explain their choice of tools and equipment in relation to the skills and techniques they will be using **PMA 9** - select materials and components suitable for the task **PMA 10** - explain their choice of materials and components according to functional properties and aesthetic qualities **PMB 6** - measure, mark out, cut and shape materials and components with some accuracy **PMB 7** - assemble, join and combine materials and components with some accuracy **PMB 14** - follow procedures for safety and hygiene **PMB 15** - use a wider range of materials and components than KS1, including	I can: ✓ order main stages of making accurately. ✓ select tools and equipment suitable for the task – explaining my choice in relation to the skills and techniques they will be using. ✓ select materials and components suitable for the task, explaining their choice. ✓ select suitable tools and equipment, explain choices in relation to required techniques and use accurately ✓ select appropriate materials, fit for purpose; explain choices

		construction materials and kits, textiles, food ingredients, mechanical components and electrical components	✓ measure, mark out, cut and shape materials/components with some accuracy ✓ assemble, join and combine materials and components with some accuracy ✓ apply a range of finishing techniques with some accuracy
To EVALUATE products	To visit Durham and investigate different bridges around the town. To explore the structure of bridges. To evaluate the product.	**PEA 4** - refer to their design criteria as they design and make **PEA 5** - use their design criteria to evaluate their completed products **PEA 8 -** identify the strengths and areas for development in their ideas and products **PEA 9** - consider the views of others, including intended users, to improve their work **PEB 9 -** who designed and made the products **PEB 10** - where products were designed and made **PEB 11** - when products were designed and made **PEB 17** - how well products have been designed **PEB 18** - how well products have been made **PEB 19** - why materials have been chosen **PEB 20** - what methods of construction have been used **PEB 21** - how well products work **PEB 22** - how well products achieve their purposes **PEB 23** - how well products meet user needs and wants	I can: ✓ refer to the design criteria to help shape the product, during making. ✓ identify a range of strengths and areas to develop within my final outcome against most specification points ✓ take account the views of others to suggest ways to improve my work.
To develop TECHNICAL KNOWLEDGE	To understand features of a bridge. To look at different styles of bridges.	**PTK 10** - how to make strong, stiff shell structures **PTK 19** - how to use learning from science to help design and make products that work **PTK 20** - how to use learning from mathematics to help design and make products that work **PTK 21** - that materials have both functional properties and aesthetic qualities **PTK 22** - that materials can be combined and mixed to create more useful characteristics	STRUCTURES I can: ✓ say that different shapes can strengthen and weaken structures and the materials can be manipulated to improve strength and stiffness ✓ design a stable structure that is able to support weight ✓ select appropriate materials to build a strong structure ✓ Apply my knowledge and understanding that shapes and structures with wide, flat bases or legs are the most stable

Year 4 Summer Term		**<u>Cooking and Nutrition</u>** **Design brief**: To create a baked snack suitable for 3 different lifestyles.	
AIMS:	**Objectives** **Children should learn to:**	**KS2 EXPECTATIONS**	**YEAR 4 EXPECTATIONS**
To DESIGN products	To design a healthy, suitable snack for an explorer in the rainforest.	**PDA 8** - gather information about the needs and wants of particular individuals and groups **PDA 9** - develop their own design criteria and use these to inform their idea **PDA13** - work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment **PDA 14** - describe the purpose of their products **PDB 6** - generate realistic ideas, focusing on the needs of the user **PDB 7** - make design decisions that take account of the availability of resources **PDB 10** - share and clarify ideas through discussion **PDB 12** - use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas	I can: ✓ gather a range of information about the needs and wants of particular individuals or groups ✓ develop a design-criteria based on the design brief [e.g. aesthetics, size, function] ✓ indicate the design features that will appeal to an intended user ✓ produce a mood board/ideas page to represent the theme of the design brief using my own ideas ✓ model/draw/talk a range of realistic design ideas focusing on the needs of the user and taking account of the availability of resources. ✓ clarify ideas through discussion. ✓ label all design ideas with design features e.g. colour choice, how particular part of my products work, direction of movement, theme, material choice with justification, can clearly describe the purpose of the product and how it will appeal to its intended user
To MAKE products	To make a healthy, suitable snack for an explorer in the rainforest.	**PMA 4** - order the main stages of making **PMA 7** - select tools and equipment suitable for the task **PMA 8** - explain their choice of tools and equipment in relation to the skills and techniques they will be using **PMB 6** - measure, mark out, cut and shape materials and components with some accuracy **PMB 7** - assemble, join and combine materials and components with some accuracy **PMB 14** - follow procedures for safety and hygiene **PMB 15** - use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components	I can: ✓ order main stages of making accurately. ✓ select tools and equipment suitable for the task – explaining my choice in relation to the skills and techniques they will be using. ✓ select materials and components suitable for the task, explaining their choice. ✓ select suitable tools and equipment, explain choices in relation to required techniques and use accurately ✓ select appropriate materials, fit for purpose; explain choices ✓ measure, mark out, cut and shape materials/components with some accuracy ✓ assemble, join and combine materials and components with some accuracy ✓ apply a range of finishing techniques with some accuracy

To EVALUATE products	To explore healthy snacks to have in the rainforest. To evaluate a snack.	**PEA 4** - refer to their design criteria as they design and make **PEA 5** - use their design criteria to evaluate their completed products **PEA 8 -** identify the strengths and areas for development in their ideas and products **PEA 9** - consider the views of others, including intended users, to improve their work **PEB 9 -** who designed and made the products **PEB 10** - where products were designed and made **PEB 11** - when products were designed and made **PEB 17** - how well products have been designed **PEB 18** - how well products have been made **PEB 19** - why materials have been chosen **PEB 20** - what methods of construction have been used **PEB 21** - how well products work **PEB 22** - how well products achieve their purposes **PEB 23** - how well products meet user needs and wants	I can: ✓ refer to the design criteria to help shape the product, during making. ✓ identify a range of strengths and areas to develop within my final outcome against most specification points ✓ take account the views of others to suggest ways to improve my work.
To develop TECHNICAL KNOWLEDGE	To design a healthy, suitable snack for an explorer in the rainforest.	**PDA 8** - gather information about the needs and wants of particular individuals and groups **PDA 9** - develop their own design criteria and use these to inform their idea **PDA13** - work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment **PDA 14** - describe the purpose of their products **PDB 6** - generate realistic ideas, focusing on the needs of the user **PDB 7** - make design decisions that take account of the availability of resources **PDB 10** - share and clarify ideas through discussion **PDB 12** - use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas	I can: ✓ gather a range of information about the needs and wants of particular individuals or groups ✓ develop a design-criteria based on the design brief [e.g. aesthetics, size, function] ✓ indicate the design features that will appeal to an intended user ✓ produce a mood board/ideas page to represent the theme of the design brief using my own ideas ✓ model/draw/talk a range of realistic design ideas focusing on the needs of the user and taking account of the availability of resources. ✓ clarify ideas through discussion. ✓ label all design ideas with design features e.g. colour choice, how particular part of my products work, direction of movement, theme, material choice with justification, can clearly describe the purpose of the product and how it will appeal to its intended user

Year 5 Autumn Term		**Structures** **Design brief:** to design and make a tensile fabric structure for a warm climate	
AIMS:	**Objectives** **Children should learn to:**	**KS2 EXPECTATIONS**	**YEAR 5 EXPECTATIONS**
To DESIGN products	To design a tensile fabric structure for a settler in a warm climate.	**PDA 10** - carry out research, using surveys, interviews, questionnaires and web-based resources **PDA 11** - identify the needs, wants, preferences and values of particular individuals and groups **PDA 12** - develop a simple design specification to guide their thinking **PDA13** - work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment **PDA 14** - describe the purpose of their products **PDA 15** - indicate the design features of their products that will appeal to intended users **PDA 16** - explain how particular parts of their products work **PDB 8** - generate innovative ideas, drawing on research **PDB 9** - make design decisions, taking account of constraints such as time, resources and cost **PDB 10** - share and clarify ideas through discussion **PDB 11** - model their ideas using prototypes and pattern pieces **PDB 12** - use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas	I can: ✓ develop a simple design specification to guide my thinking ✓ carry out research using questionnaires to gather information ✓ identify the needs and wants of a particular individual or group ✓ produce a mood board/ideas page to represent the theme of the design brief using my own ideas as well as displaying links to the intended client ✓ model/draw/talk some innovative design ideas, clearly drawing on research ✓ design to meet the needs of a particular individual or groups of people ✓ label all design ideas with design features e.g. colour choice, how particular part of their products work, direction of movement, theme, material choice with justification, some reference to construction method and how it will appeal to the intended user ✓ begin to draw a 2 point perspective drawing or cross sectional drawing of my final design. ✓ can use a tools on CAD to apply the aesthetics to a design
To MAKE products	To make a tensile fabric structure.	**PMA 5** - produce appropriate lists of tools, equipment and materials that they need **PMA 6** - formulate step-by-step plans as a guide to making **PMA 7** - select tools and equipment suitable for the task **PMA 8** - explain their choice of tools and equipment in relation to the skills and techniques they will be using **PMA 9** - select materials and components suitable for the task **PMA 10** - explain their choice of materials and components according to functional properties and aesthetic qualities **PMB 9** - accurately measure, mark out, cut and shape materials and components **PMB 12** - use techniques that involve a number of steps **PMB 13** - demonstrate resourcefulness when tackling practical problem **PMB 14** - follow procedures for safety and hygiene **PMB 15** - use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components	I can: ✓ produce a plan of making with correct tools listed. ✓ use selected tools/equipment with good level of precision ✓ select appropriate materials, fit for purpose; explain choices, considering functionality ✓ mainly accurately measure, mark out, cut and shape materials/components ✓ mainly accurately assemble, join and combine materials/components ✓ mainly accurately apply a range of finishing techniques

To EVALUATE products	To evaluate a tensile fabric structure.	**PEA 6** - critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make **PEA 7** - evaluate their ideas and products against their original design specification **PEA 8 -** identify the strengths and areas for development in their ideas and products **PEA 9** - consider the views of others, including intended users, to improve their work **PEB 13** - how much products cost to make **PEB 16** - what impact products have beyond their intended purpose **PEB 17** - how well products have been designed **PEB 18** - how well products have been made **PEB 19** - why materials have been chosen **PEB 20** - what methods of construction have been used **PEB 21** - how well products work **PEB 22** - how well products achieve their purposes **PEB 23** - how well products meet user needs and wants	I can: ✓ describe a range of strengths and areas to develop within my final outcome against the specification ✓ take account the views of others to improve my work. ✓ make reference to the quality of the design, manufacture and fitness for purpose ✓ draw a suggested improvement based on feedback
To develop TECHNICAL KNOWLEDGE	To learn about tensile fabric structures. To learn different assembly and strengthening techniques.	**PTK 16** - how to reinforce and strengthen a 3D framework **PTK 20** - how to use learning from mathematics to help design and make products that work **PTK 21** - that materials have both functional properties and aesthetic qualities **PTK 22** - that materials can be combined and mixed to create more useful characteristics **PTK 23** - that mechanical and electrical systems have an input, process and output **PTK 24** - the correct technical vocabulary for the projects they are undertaking	STRUCTURES I can: ✓ try lots of different ways to reinforce frames to make them sturdier ✓ identify where a structure needs reinforcement and use corners for support

Year 5 Spring Term		**Cooking and Nutrition/CAD** **Design brief**: to design and create food packaging	
AIMS:	**Objectives** **Children should learn to:**	**KS2 EXPECTATIONS**	**YEAR 5 EXPECTATIONS**
To DESIGN products	To research the use of and different types of food packaging. To design an appropriate packaging for a particular food.	**PDA 10** - carry out research, using surveys, interviews, questionnaires and web-based resources **PDA 11** - identify the needs, wants, preferences and values of particular individuals and groups **PDA 12** - develop a simple design specification to guide their thinking **PDA13** - work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment **PDA 14** - describe the purpose of their products **PDA 15** - indicate the design features of their products that will appeal to intended users **PDA 16** - explain how particular parts of their products work **PDB 8** - generate innovative ideas, drawing on research **PDB 9** - make design decisions, taking account of constraints such as time, resources and cost **PDB 10** - share and clarify ideas through discussion **PDB 11** - model their ideas using prototypes and pattern pieces **PDB 12** - use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas **PDB 13** - use computer-aided design to develop and communicate their ideas	I can: ✓ develop a simple design specification to guide my thinking ✓ carry out research using questionnaires to gather information ✓ identify the needs and wants of a particular individual or group ✓ produce a mood board/ideas page to represent the theme of the design brief using my own ideas as well as displaying links to the intended client ✓ model/draw/talk some innovative design ideas, clearly drawing on research ✓ design to meet the needs of a particular individual or groups of people ✓ label all design ideas with design features e.g. colour choice, how particular part of their products work, direction of movement, theme, material choice with justification, some reference to construction method and how it will appeal to the intended user ✓ begin to draw a 2 point perspective drawing or cross sectional drawing of my final design. ✓ can use a tools on CAD to apply the aesthetics to a design
To MAKE products	To make an appropriate packaging for a particular food.	**PMA 5** - produce appropriate lists of tools, equipment and materials that they need **PMA 6** - formulate step-by-step plans as a guide to making **PMA 7** - select tools and equipment suitable for the task **PMA 8** - explain their choice of tools and equipment in relation to the skills and techniques they will be using **PMA 9** - select materials and components suitable for the task **PMA 10** - explain their choice of materials and components according to functional properties and aesthetic qualities **PMB 9** - accurately measure, mark out, cut and shape materials and components **PMB 10** - accurately assemble, join and combine materials and components **PMB 11** - accurately apply a range of finishing techniques, including those from art and design **PMB 12** - use techniques that involve a number of steps	I can: ✓ produce a plan of making with correct tools listed. ✓ use selected tools/equipment with good level of precision ✓ select appropriate materials, fit for purpose; explain choices, considering functionality ✓ mainly accurately measure, mark out, cut and shape materials/components ✓ mainly accurately assemble, join and combine materials/components

		PMB 13 - demonstrate resourcefulness when tackling practical problem **PMB 14** - follow procedures for safety and hygiene **PMB 15** - use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components	✓ mainly accurately apply a range of finishing techniques
To EVALUATE products	To evaluate packaging for a particular food.	**PEA 6** - critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make **PEA 7** - evaluate their ideas and products against their original design specification **PEA 8** - identify the strengths and areas for development in their ideas and products **PEA 9** - consider the views of others, including intended users, to improve their work **PEB 13** - how much products cost to make **PEB 14** - how innovative products are **PEB 15** - how sustainable the materials in products are **PEB 16** - what impact products have beyond their intended purpose **PEB 17** - how well products have been designed **PEB 18** - how well products have been made **PEB 19** - why materials have been chosen **PEB 20** - what methods of construction have been used **PEB 21** - how well products work **PEB 22** - how well products achieve their purposes **PEB 23** - how well products meet user needs and wants	I can: ✓ describe a range of strengths and areas to develop within my final outcome against the specification ✓ take account the views of others to improve my work. ✓ make reference to the quality of the design, manufacture and fitness for purpose ✓ draw a suggested improvement based on feedback
To develop TECHNICAL KNOWLEDGE	How information about food available to the consumer, including labelling and marketing, influences food choice. Mandatory information included on food packaging in accordance with current European Union and Food Standards Agency (FSA) legislation Non-mandatory information: provenance, serving suggestions How to interpret nutritional labelling How food marketing can influence food choice eg buy one get one free, special offers, meal deals, media influences, advertising, point of sales marketing	**PTK 13** - how mechanical systems such as cams or pulleys or gears create movement **PTK 14** - how more complex electrical circuits and components can be used to create functional products **PTK 15** - how to program a computer to monitor changes in the environment and control their products **PTK 16** - how to reinforce and strengthen a 3D framework **PTK 17** - that a 3D textiles product can be made from a combination of fabric shapes **PTK 18** - that a recipe can be adapted by adding or substituting one or more ingredients **PTK 19** - how to use learning from science to help design and make products that work **PTK 20** - how to use learning from mathematics to help design and make products that work **PTK 21** - that materials have both functional properties and aesthetic qualities **PTK 22** - that materials can be combined and mixed to create more useful characteristics **PTK 23** - that mechanical and electrical systems have an input, process and output **PTK 24** - the correct technical vocabulary for the projects they are undertaking	CONTROL I can: ✓ programme a computer application to control a product COOKING AND NUTRITION I can: ✓ present my product well - interesting, attractive, fit for purpose ✓ describe how recipes can be adapted to change appearance, taste, texture, aroma ✓ explain how there are different substances in food / drink needed for health

Year 5 Summer Term		**Control** Design brief: To design and make an alarm for a person and problem of your choice	
AIMS:	**Objectives** **Children should learn to:**	**KS2 EXPECTATIONS**	**YEAR 5 EXPECTATIONS**
To DESIGN products	To design an alarm.	**PDA 12** - develop a simple design specification to guide their thinking **PDA 14** - describe the purpose of their products **PDA 15** - indicate the design features of their products that will appeal to intended users **PDA 16** - explain how particular parts of their products work **PDB 10** - share and clarify ideas through discussion **PDB 11** - model their ideas using prototypes and pattern pieces **PDB 12** - use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas	I can: ✓ develop a simple design specification to guide my thinking ✓ carry out research using questionnaires to gather information ✓ identify the needs and wants of a particular individual or group ✓ produce a mood board/ideas page to represent the theme of the design brief using my own ideas as well as displaying links to the intended client ✓ model/draw/talk some innovative design ideas, clearly drawing on research ✓ design to meet the needs of a particular individual or groups of people ✓ label all design ideas with design features e.g. colour choice, how particular part of their products work, direction of movement, theme, material choice with justification, some reference to construction method and how it will appeal to the intended user ✓ begin to draw a 2 point perspective drawing or cross sectional drawing of my final design. ✓ can use a tools on CAD to apply the aesthetics to a design
To MAKE products	To make an alarm.	**PMA 5** - produce appropriate lists of tools, equipment and materials that they need **PMA 6** - formulate step-by-step plans as a guide to making **PMA 9** - select materials and components suitable for the task **PMB 9** - accurately measure, mark out, cut and shape materials and components **PMB 10** - accurately assemble, join and combine materials and components **PMB 12** - use techniques that involve a number of steps **PMB 13** - demonstrate resourcefulness when tackling practical problem	I can: ✓ produce a plan of making with correct tools listed. ✓ use selected tools/equipment with good level of precision ✓ select appropriate materials, fit for purpose; explain choices, considering functionality ✓ mainly accurately measure, mark out, cut and shape materials/components ✓ mainly accurately assemble, join and combine materials/components ✓ mainly accurately apply a range of finishing techniques
To EVALUATE products	To explore using a coding programme [www.microbit.org].	**PEA 6** - critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make **PEA 7** - evaluate their ideas and products against their original design specification **PEA 8 -** identify the strengths and areas for development in their ideas and products	I can: ✓ describe a range of strengths and areas to develop within my final outcome against the specification ✓ take account the views of others to improve my work. ✓ make reference to the quality of the design, manufacture and fitness for purpose ✓ draw a suggested improvement based on feedback

		PEA 9 - consider the views of others, including intended users, to improve their work **PEB 17** - how well products have been designed **PEB 18** - how well products have been made **PEB 21** - how well products work **PEB 22** - how well products achieve their purposes **PEB 23** - how well products meet user needs and wants	
To develop TECHNICAL KNOWLEDGE	To know how to use the microbit technology. To explore different alarms to learn how they work.	**PTK 15** - how to program a computer to monitor changes in the environment and control their products **PTK 16** - how to reinforce and strengthen a 3D framework **PTK 23** - that mechanical and electrical systems have an input, process and output **PTK 24** - the correct technical vocabulary for the projects they are undertaking	CONTROL I can: ✓ programme a computer application to control a product ✓ use a programme to monitor changes

Year 6 Autumn Term		Textiles Design brief: to design and create a fabric item to carry objects a refugee would take with them	
AIMS:	**Objectives** **Children should learn to:**	**KS2 EXPECTATIONS**	**YEAR 6 EXPECTATIONS**
To DESIGN products	To look at different items a refugee carries with them. To design an appropriate item to carry objects.	**PDA 10** - carry out research, using surveys, interviews, questionnaires and web-based resources **PDA 11** - identify the needs, wants, preferences and values of particular individuals and groups **PDA 12** - develop a simple design specification to guide their thinking **PDA13** - work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment **PDA 14** - describe the purpose of their products **PDA 15** - indicate the design features of their products that will appeal to intended users **PDA 16** - explain how particular parts of their products work **PDB 8** - generate innovative ideas, drawing on research **PDB 9** - make design decisions, taking account of constraints such as time, resources and cost **PDB 10** - share and clarify ideas through discussion **PDB 11** - model their ideas using prototypes and pattern pieces **PDB 12** - use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas **PDB 13** - use computer-aided design to develop and communicate their ideas	I can: ✓ develop a simple design specification to guide my thinking e.g. • Aesthetics • Cost • Customer • Environment • Safety • Size • Function • Manufacture ✓ carry out research using surveys, interviews and the web to inform my design ideas ✓ use the data from my research, to identify the needs, wants, preferences and values of the client ✓ produce a mood board/ideas page to represent the theme of the design brief using my own ideas as well as displaying links to the intended client ✓ generate a broad range of innovate design concepts, clearly drawing on primary and secondary research ✓ design to clearly meet the needs of a particular individual or groups of people ✓ use ACCESSFM to evaluate each design idea: • Aesthetics • Cost • Customer • Environment • Safety • Size • Function • Manufacture ✓ begin to be able to draw a 2 point perspective drawing or cross sectional drawing of their final design. ✓ create a 3D mock-up prototype before the final manufacture ✓ use a range of tools on CAD to apply the aesthetics to a design
To MAKE products	To make an appropriate item to carry objects.	**PMA 5** - produce appropriate lists of tools, equipment and materials that they need	I can:

		PMA 6 - formulate step-by-step plans as a guide to making **PMA 7** - select tools and equipment suitable for the task **PMA 8** - explain their choice of tools and equipment in relation to the skills and techniques they will be using **PMA 9** - select materials and components suitable for the task **PMA 10** - explain their choice of materials and components according to functional properties and aesthetic qualities **PMB 9** - accurately measure, mark out, cut and shape materials and components **PMB 10** - accurately assemble, join and combine materials and components **PMB 11** - accurately apply a range of finishing techniques, including those from art and design **PMB 12** - use techniques that involve a number of steps **PMB 13** - demonstrate resourcefulness when tackling practical problem **PMB 14** - follow procedures for safety and hygiene **PMB 15** - use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components	✓ produce a descriptive plan of making for each stage, including a list of tools, equipment and materials needed for the product ✓ use selected tools and equipment precisely ✓ select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics ✓ accurately measure, mark out, cut and shape materials/components ✓ accurately assemble, join and combine materials/components ✓ accurately apply a range of finishing techniques
To EVALUATE products	To evaluate an appropriate item to carry objects.	**PEA 6** - critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make **PEA 7** - evaluate their ideas and products against their original design specification **PEA 8 -** identify the strengths and areas for development in their ideas and products **PEA 9** - consider the views of others, including intended users, to improve their work **PEB 13** - how much products cost to make **PEB 14** - how innovative products are **PEB 15** - how sustainable the materials in products are **PEB 16** - what impact products have beyond their intended purpose **PEB 17** - how well products have been designed **PEB 18** - how well products have been made **PEB 19** - why materials have been chosen **PEB 20** - what methods of construction have been used **PEB 21** - how well products work **PEB 22** - how well products achieve their purposes **PEB 23** - how well products meet user needs and wants	I can: ✓ describe and justify a range of strengths and areas to develop within my final outcome against the specification ✓ use the views of others to carefully improve my work. ✓ make clear reference to the quality of the design, manufacture and fitness for purpose ✓ provide a labelled sketch of further modification, using intended user feedback to direct/influence changes. ✓ describe how inventors/designers/chefs etc have developed products.
To develop TECHNICAL KNOWLEDGE	Join fabrics together using any of the previously learnt stitches. Choose an appropriate fastener for the design brief. Position it so we don't waste fabric.	**PTK 13** - how mechanical systems such as cams or pulleys or gears create movement **PTK 14** - how more complex electrical circuits and components can be used to create functional products **PTK 15** - how to program a computer to monitor changes in the environment and control their products	TEXTILES I can: ✓ think about user's wants/needs and aesthetics when choosing textiles ✓ make product attractive and strong ✓ make a prototype

		PTK 16 - how to reinforce and strengthen a 3D framework **PTK 17** - that a 3D textiles product can be made from a combination of fabric shapes **PTK 18** - that a recipe can be adapted by adding or substituting one or more ingredients **PTK 19** - how to use learning from science to help design and make products that work **PTK 20** - how to use learning from mathematics to help design and make products that work **PTK 21** - that materials have both functional properties and aesthetic qualities **PTK 22** - that materials can be combined and mixed to create more useful characteristics **PTK 23** - that mechanical and electrical systems have an input, process and output **PTK 24** - the correct technical vocabulary for the projects they are undertaking	✓ use a range of joining techniques ✓ think about how product might be sold ✓ think carefully about what would improve product

Year 6 Spring Term		**<u>Mechanisms [mechanical systems and pulleys] and Electronics</u>** Design brief: to design and create a rescue mechanism	
AIMS:	**Objectives** **Children should learn to:**	**KS2 EXPECTATIONS**	**YEAR 6 EXPECTATIONS**
To DESIGN products	To look at different rescue mechanisms. To design a rescue mechanism.	**PDA 10** - carry out research, using surveys, interviews, questionnaires and web-based resources **PDA 11** - identify the needs, wants, preferences and values of particular individuals and groups **PDA 12** - develop a simple design specification to guide their thinking **PDA13** - work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment **PDA 14** - describe the purpose of their products **PDA 15** - indicate the design features of their products that will appeal to intended users **PDA 16** - explain how particular parts of their products work **PDB 8** - generate innovative ideas, drawing on research **PDB 9** - make design decisions, taking account of constraints such as time, resources and cost **PDB 10** - share and clarify ideas through discussion **PDB 11** - model their ideas using prototypes and pattern pieces **PDB 12** - use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas **PDB 13** - use computer-aided design to develop and communicate their ideas	I can: ✓ develop a simple design specification to guide my thinking e.g. • Aesthetics • Cost • Customer • Environment • Safety • Size • Function • Manufacture ✓ carry out research using surveys, interviews and the web to inform my design ideas ✓ use the data from my research, to identify the needs, wants, preferences and values of the client ✓ produce a mood board/ideas page to represent the theme of the design brief using my own ideas as well as displaying links to the intended client ✓ generate a broad range of innovate design concepts, clearly drawing on primary and secondary research ✓ design to clearly meet the needs of a particular individual or groups of people ✓ use ACCESSFM to evaluate each design idea: • Aesthetics • Cost • Customer

			• Environment • Safety • Size • Function • Manufacture ✓ begin to be able to draw a 2 point perspective drawing or cross sectional drawing of their final design. ✓ create a 3D mock-up prototype before the final manufacture ✓ use a range of tools on CAD to apply the aesthetics to a design
To MAKE products	To make a rescue mechanism.	**PMA 5** - produce appropriate lists of tools, equipment and materials that they need **PMA 6** - formulate step-by-step plans as a guide to making **PMA 7** - select tools and equipment suitable for the task **PMA 8** - explain their choice of tools and equipment in relation to the skills and techniques they will be using **PMA 9** - select materials and components suitable for the task **PMA 10** - explain their choice of materials and components according to functional properties and aesthetic qualities **PMB 9** - accurately measure, mark out, cut and shape materials and components **PMB 10** - accurately assemble, join and combine materials and components **PMB 11** - accurately apply a range of finishing techniques, including those from art and design **PMB 12** - use techniques that involve a number of steps **PMB 13** - demonstrate resourcefulness when tackling practical problem **PMB 14** - follow procedures for safety and hygiene **PMB 15** - use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components	I can: ✓ produce a descriptive plan of making for each stage, including a list of tools, equipment and materials needed for the product ✓ use selected tools and equipment precisely ✓ select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics ✓ accurately measure, mark out, cut and shape materials/components ✓ accurately assemble, join and combine materials/components ✓ accurately apply a range of finishing techniques
To EVALUATE products	To evaluate a rescue mechanism.	**PEA 6** - critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make **PEA 7** - evaluate their ideas and products against their original design specification **PEA 8** - identify the strengths and areas for development in their ideas and products **PEA 9** - consider the views of others, including intended users, to improve their work **PEB 13** - how much products cost to make **PEB 14** - how innovative products are **PEB 15** - how sustainable the materials in products are **PEB 16** - what impact products have beyond their intended purpose **PEB 17** - how well products have been designed **PEB 18** - how well products have been made **PEB 19** - why materials have been chosen **PEB 20** - what methods of construction have been used **PEB 21** - how well products work **PEB 22** - how well products achieve their purposes **PEB 23** - how well products meet user needs and wants	I can: ✓ describe and justify a range of strengths and areas to develop within my final outcome against the specification ✓ use the views of others to carefully improve my work. ✓ make clear reference to the quality of the design, manufacture and fitness for purpose ✓ provide a labelled sketch of further modification, using intended user feedback to direct/influence changes. ✓ describe how inventors/designers/chefs etc have developed products.

To develop TECHNICAL KNOWLEDGE	Explore & use mechanical systems (gears, pulleys and cams). Use innovative combinations of mechanics in product designs.	**PTK 13** - how mechanical systems such as cams or pulleys or gears create movement **PTK 14** - how more complex electrical circuits and components can be used to create functional products **PTK 15** - how to program a computer to monitor changes in the environment and control their products **PTK 16** - how to reinforce and strengthen a 3D framework **PTK 17** - that a 3D textiles product can be made from a combination of fabric shapes **PTK 18** - that a recipe can be adapted by adding or substituting one or more ingredients **PTK 19** - how to use learning from science to help design and make products that work **PTK 20** - how to use learning from mathematics to help design and make products that work **PTK 21** - that materials have both functional properties and aesthetic qualities **PTK 22** - that materials can be combined and mixed to create more useful characteristics **PTK 23** - that mechanical and electrical systems have an input, process and output **PTK 24** - the correct technical vocabulary for the projects they are undertaking	ELECTRONICS I can: ✓ create a simple motor ✓ create a simple circuit to make a flashing light ✓ select appropriate electronic components to make a particular circuit MECHANISMS I can: ✓ confidently provide a broad range of examples of mechanisms ✓ with greater confidence and independence, connect a range of mechanical systems together ✓ describe how to convert one type of motion to another and provide an example ✓ combine a broad range of mechanisms together ✓ confidently name and describe each mechanism, input and output correctly (input is the motion used to start a mechanism. An output is the motion that happens as a result of starting the input) ✓ create a simple pulley system to move a load ✓ identify what stops wheels from turning and understands that a wheel needs an axel in order to move

Year 6 Summer Term		**<u>Mechanisms and Electronics</u>** Design brief: to design and make an electric car	
AIMS:	**Objectives** **Children should learn to:**	**KS2 EXPECTATIONS**	**YEAR 6 EXPECTATIONS**
To DESIGN products	To design a car for an intended purpose.	**PDA 12** - develop a simple design specification to guide their thinking **PDA13** - work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment **PDA 16** - explain how particular parts of their products work **PDB 8** - generate innovative ideas, drawing on research **PDB 9** - make design decisions, taking account of constraints such as time, resources and cost **PDB 10** - share and clarify ideas through discussion **PDB 12** - use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas	I can: ✓ develop a simple design specification to guide my thinking e.g. • Aesthetics • Cost • Customer • Environment • Safety • Size • Function • Manufacture ✓ carry out research using surveys, interviews and the web to inform my design ideas

			✓ use the data from my research, to identify the needs, wants, preferences and values of the client ✓ produce a mood board/ideas page to represent the theme of the design brief using my own ideas as well as displaying links to the intended client ✓ generate a broad range of innovate design concepts, clearly drawing on primary and secondary research ✓ design to clearly meet the needs of a particular individual or groups of people ✓ use ACCESSFM to evaluate each design idea: • Aesthetics • Cost • Customer • Environment • Safety • Size • Function • Manufacture ✓ begin to be able to draw a 2 point perspective drawing or cross sectional drawing of their final design. ✓ create a 3D mock-up prototype before the final manufacture ✓ use a range of tools on CAD to apply the aesthetics to a design
To MAKE products	To make their design prototype.	**PMA 5** - produce appropriate lists of tools, equipment and materials that they need **PMA 7** - select tools and equipment suitable for the task **PMA 8** - explain their choice of tools and equipment in relation to the skills and techniques they will be using **PMA 9** - select materials and components suitable for the task **PMA 10** - explain their choice of materials and components according to functional properties and aesthetic qualities **PMB 9** - accurately measure, mark out, cut and shape materials and components **PMB 10** - accurately assemble, join and combine materials and components **PMB 12** - use techniques that involve a number of steps **PMB 13** - demonstrate resourcefulness when tackling practical problem **PMB 14** - follow procedures for safety and hygiene	I can: ✓ produce a descriptive plan of making for each stage, including a list of tools, equipment and materials needed for the product ✓ use selected tools and equipment precisely ✓ select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics ✓ accurately measure, mark out, cut and shape materials/components ✓ accurately assemble, join and combine materials/components ✓ accurately apply a range of finishing techniques
To EVALUATE products	To explore how pulleys and gears can create movement. To evaluate their product design.	**PEA 6** - critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make **PEA 8 -** identify the strengths and areas for development in their ideas and products **PEB 14** - how innovative products are **PEB 15** - how sustainable the materials in products are **PEB 16** - what impact products have beyond their intended purpose **PEB 17** - how well products have been designed **PEB 18** - how well products have been made **PEB 19** - why materials have been chosen **PEB 20** - what methods of construction have been used **PEB 21** - how well products work **PEB 22** - how well products achieve their purposes **PEB 23** - how well products meet user needs and wants	I can: ✓ describe and justify a range of strengths and areas to develop within my final outcome against the specification ✓ use the views of others to carefully improve my work. ✓ make clear reference to the quality of the design, manufacture and fitness for purpose ✓ provide a labelled sketch of further modification, using intended user feedback to direct/influence changes. ✓ describe how inventors/designers/chefs etc have developed products.

To develop TECHNICAL KNOWLEDGE	To learn about inventors, designs and engineers [electric cars]. To know how pulleys and gears create movement.	**PTK 13** - how mechanical systems such as cams or pulleys or gears create movement **PTK 18** - that a recipe can be adapted by adding or substituting one or more ingredients **PTK 19** - how to use learning from science to help design and make products that work	ELECTRONICS I can: ✓ create a simple motor ✓ create a simple circuit to make a flashing light ✓ select appropriate electronic components to make a particular circuit MECHANISMS I can: ✓ confidently provide a broad range of examples of mechanisms ✓ with greater confidence and independence, connect a range of mechanical systems together ✓ describe how to convert one type of motion to another and provide an example ✓ combine a broad range of mechanisms together ✓ confidently name and describe each mechanism, input and output correctly (input is the motion used to start a mechanism. An output is the motion that happens as a result of starting the input) ✓ create a simple pulley system to move a load ✓ identify what stops wheels from turning and understands that a wheel needs an axel in order to move