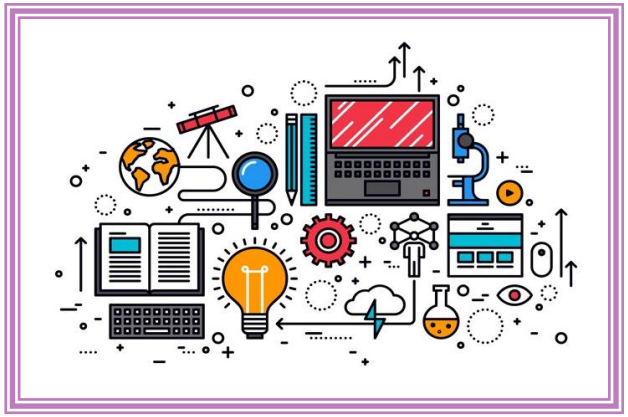
Lingdale Primary School

Design and Technology Curriculum



Design and Technology Curriculum Intent:

At Lingdale Primary School our children will follow the design, create and evaluate process within this subject. Our Design and Technology Curriculum includes broad concepts that are embedded throughout the curriculum so that each one can be encountered multiple times. It also has a clear focus on disciplinary concepts so that pupils learn how to design, create and evaluate. These components enable pupils to develop and communicate their personal ideas, observations and creations. D&T allows children to apply the knowledge and skills learned in other subjects, particularly Maths, Science and Art.

By the end of Key Stage 2 our children should;

- Recognise the result of design and technology in everyday life.
- Know that DT is where they learn to make and evaluate things effectively.
- Understand the design, make, evaluate cycle, through the 5 key areas of DT:
  -Food Technology
  -Textiles
  -Structures
  -Mechanisms
  -Electrical Systems (linked to computing)

Whilst these are discrete strands, the knowledge and skills gained in each are applied and built upon progressively across the curriculum.

- It is key that food technology is weaved across wider learning opportunities
- We aim to ensure children are confident and safe with a range of simple tools – they can choose and select them safely and sensibly
- They know the key knowledge identified in each unit, so that they have a firm knowledge base at the end of KS2.
- Ensure pupils know more, remember more, and do more, enabling meaningful progression throughout their school journey.

Curriculum Knowledge and Skills

Design and Technology			
Substantive Knowledge Concepts			
Cooking and Nutrition **Knowledge of food, how to prepare it and the principles of a healthy diet.**	**Textiles** **Knowledge of a range of fabrics and sewing techniques, to make informed choices linked to suitability for product.**	**Mechanisms** **Knowledge of varying design and technology mechanisms, including how they built a model or structure with the mechanism, and which tools and products they used to do it.**	**Structures** **Knowledge of different structures and how they can be stabilised and strengthened. Know a range of finishing techniques that can be used to improve physical appearance.**

Disciplinary Knowledge and Skills How we work and think like an expert in DT.				
Designing **Understanding Contexts, Users and Purposes. Generating, developing, modelling and communicating ideas**	**Making** **Planning, Practical Skills and Techniques.**	**Technical Knowledge** **Applying their knowledge of specific materials to meet the criteria listed in the design, make and evaluation stages.**	**Evaluating and Analysing** **Evaluate and analyse a range of existing products and their own designs based on a specific design criteria. Know how key individuals have helped to shape the world in which we live in.**	**Food and Nutrition** **Understand and apply the principles of nutrition and learn how to cook.**

	Autumn	Spring	Summer
EYFS: *Foundations for DT*	Foundations of Learning – The Early Years Our Design Technology starts with firm foundations, in Reception. Key knowledge and skills are taught explicitly to ensure that children are effectively prepared for the demands of the Key Stage 1 Curriculum. Designing, making and creating are at the heart of strong Early Years provision; we harness this natural creativity to develop our youngest children's knowledge and skills. The Design Technology opportunities below are some of the key opportunities that are afforded to our children, however, as part of our continuous provision, children are designing, trialling, creating and evaluating all of the time – be it in a construction area with a range of building blocks, in the junk modelling area, at the creation station or outside with the large loose parts. It is important to give our children lots of opportunities to develop the strength in their fingers, hand –eye coordination, to name and know the purpose of common tools as well as precision when using small tools correctly. Our approach ensures that children can meet the demands of the Early Learning Goal: Creating with Materials (DT linked strands – this ELG also links to Art and Design) Children at the expected level of development will: • Draw and paint using a range of materials, tools and techniques, experimenting with colour, design, texture, form and function • Share their creations, explaining the process they have used Importantly, a strong foundation in Design Technology will also support children's development in relation to an aspect of the ELG: Fine Motor Skills • Use a range of small tools, including scissors, paint brushes and cutlery; In addition, Design Technology is a great subject to support children's development in relation to Personal, Social and Emotional development. ELG: Self-Regulation • Set and work towards simple goals, being able to wait for what they want and control their immediate impulses when appropriate ELG: Managing Self • Be confident to try new activities and show independence, resilience and perseverance in the face of challenge • Explain the reasons for rules, know right from wrong and try to behave accordingly		
Years 1 & 2 ***Cycle A***	**Textiles** *Make a Paddington puppet – templates and joining.*	**Cooking and Nutrition** *Make a healthy wrap – prepare fruit and vegetables.*	**Structures** *Make a windmill – freestanding structures.*
Years 1 & 2 ***Cycle B***	**Mechanisms** *Make a moving picture – sliders and leavers.*	**Cooking and Nutrition** *Make a healthy smoothie – 5 a day healthy eating.*	**Mechanisms** *Make a Ferris wheel – wheels and axels.*
Years 3 & 4 ***Cycle A***	**Cooking and Nutrition** *Alternative biscuits – healthy and varied diets.*	**Textiles** *Make a book sleeve in preparation for World Book Day – fastenings.*	**Electrical Systems** *Making a torch – simple circuits and switches.*
Years 3 & 4 ***Cycle B***	**Mechanisms** *Create a moving Christmas card – leavers and linkages.*	**Mechanisms** *Making a moving monster – pneumatics.*	**Structures** *Making a castle – 3D shape modelling.*
Years 5 & 6 ***Cycle A***	**Textiles** *To create a stuffed toy – sewing and stitching.*	**Mechanisms** *To make a bike – gears and pulleys.*	**Electrical Systems** *More complex circuits with a motorised product.*
Years 5 & 6 ***Cycle B***	**Mechanisms** *Make an automated toy - CAMS.*	**Cooking and Nutrition** *Come and dine with me – supply chain with understanding of a 3 course meal.*	**Structures** *To make a bridge linked to the River Tees – bridge structures.*

EYFS

Foundations for Design and Technology

EYFS Foundation for Design and Technology	
Areas of Learning	**Early Learning Goal for Physical Development and Expressive Art and Design**
<u>Physical Development and Expressive Arts</u> Gross and fine motor experiences develop incrementally throughout early childhood, starting with sensory explorations and the development of a child's strength, co-ordination and positional awareness through tummy time, crawling and play movement with both objects and adults. Fine motor control and precision helps with hand-eye co-ordination, which is later linked to early literacy. Repeated and varied opportunities to explore and play with small world activities, puzzles, arts and crafts and the practice of using small tools, with feedback and support from adults, allow children to develop proficiency, control and confidence. 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.	Use a range of small tools including, scissors, paint brushes and cutlery. ·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. **Key Vocabulary** Design: draw, ideas. Make: build, make. Evaluate: like, don't like, better, worse. Textiles: bead, button, fabric, felt, scissors, sew. Materials: cellotape, glue stick, masking tape, paperclip, plasticine, ruler, straw. Cooking: Apron, chop, cut, equipment, fork, knife, spoon, mix

Conceptual Knowledge and Understanding

Nursery	Reception
· Explore systems in toys e.g. pop-up books. understand how to manipulate items - pushing toys forwards and backwards. use one-handed tools and equipment. · Use scissors to snip paper. · Explore a range of materials and begin to experiment with them to create forms and structures. · Explore some simple joining techniques (glue, tape). · Begin to select tools independently for a given purpose. · Say what they have made and how they have made it.	· Use one-handed tools and equipment with increasing control and accuracy. · Use scissors to cut out more complex shapes and cut outs. · Look at pictures to help decide what to make. · Begin to make decisions about what to create. · Look at pictures of real structures/buildings/vehicles etc. and talk about their features with others to help develop ideas. · Refine ability to create forms and structures using a range of materials and textures. · Explore a variety of effects to express my ideas when using materials for decorative purposes. · Select an appropriate tool for a given purpose. · Safely use and explore tools to achieve a texture, form or function e.g. cutting, stirring, printing. · Work with peers to create a shared project. · Say what they like about a model or structure they have made and describe it's features. · Reflect and make choices about how to improve their model as they work on it. · Listen to feedback from others to improve a creation. · Transfer skills and techniques from previous learning into new projects.

Year 1/2

Cycle A

DT Sequences of Learning

Topics of Study: Textiles, Cooking and Nutrition and Structures	**Term: ALL**	**Year:** 1/2 Cycle A

National Curriculum	**Key Substantive Knowledge**
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 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.	**Textiles** • Know that 'joining technique' means connecting two pieces of material together. • Know that there are various temporary methods of joining fabric by using staples, glue or pins. • Know that different techniques for joining materials can be used for different purposes. • Know that a template (or fabric pattern) is used to cut out the same shape multiple times. • Know that drawing a design idea is useful to see how an idea will look. **Cooking and Nutrition** • Know that 'diet' means the food and drink that a person or animal usually eats. • Know what makes a balanced diet. • Know the five main food groups are: carbohydrates, fruits and vegetables, protein, dairy and oils and spreads. • Know I should eat a range of different foods from each food group, and roughly how much of each food group. • Know that 'ingredients' means the items in a mixture or recipe. • Know how to cut, grate, snip and spread to prepare foods. • Know to review and give a score to evaluate. **Structures** • Know the sails or blades of a windmill are moved by the wind. • Know that windmills are used to generate power and were used for grinding flour. • Know a structure is something built for a reason. • Know that stable structures do not topple. • Know that adding weight to the base of a structure can make it more stable.

Vocabulary
Decorate, design, fabric, glue, model, hand puppet, safety pin, staple, stencil, template, appearance, balanced, carbohydrates, chopping board, combination, cut, dairy, design, design brief, diet, evaluate, feel, fruit, grate, grater, ingredients, menu, oils, proteins, review, scissors, smell, snip, spread, spreads, table knife, taste, vegetables, base, centre, design, equal, evaluate, middle, rotate, rotor, rotor blades, sails, same, stable, strong, structure, test, weak, wind, windmill.

Year 1/2 DT Cycle A: Textiles – Autumn Term				
Can we create our own puppet?				
Session 1	**Session 2**	**Session 3**	**Session 4**	**Session 5**
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
How can we explore different ways when joining fabric?	*Who could we make a puppet for and how can we design it so that it will appeal to them?*	*How can you make a 3D textile structure?*	*How can we use a running stitch to join two fabric shapes into one?*	*Can we decorate our pouch following our original design?*
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Know that there are various temporary methods of joining fabric by using staples, glue or pins.	• Know that drawing a design idea is useful to see how an idea will look. • Know that a template (or fabric pattern) is used to cut out the same shape multiple times.	• Know that 'joining technique' means connecting two pieces of material together. • Understand that different techniques for joining materials can be used for different purposes.	• Know that 'joining technique' means connecting two pieces of material together. • Understand that different techniques for joining materials can be used for different purposes.	• Know that 'joining technique' means connecting two pieces of material together. • Understand that different techniques for joining materials can be used for different purposes.
Disciplinary Skills	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**
Technical Knowledge **Year 1:** Practise cutting and threading using scissors in a correct manner. ***Technical Knowledge*** **Year 2:** Use scissors correctly, threading, sewing with support and tying threads and fabric.	***Evaluating and Analysing*** **Year 1:** Discuss which materials are best to use. ***Evaluating and Analysing*** **Year 2**: Describe which materials and decorations would be fit for purpose and why?	***Making*** **Year 1**: Use a template to make our 3D structure ***Making*** **Year 2:** Follow instructions to make a 3D structure that uses a joining technique to join two or more materials together.	***Making*** **Year 1**: Respond to amendments purposefully with support. ***Making / Analysing*** **Year 2**: Respond to shapes becoming misaligned; the thread running out or a problem with the stitching.	***Designing*** **Year 1:** Using decorative techniques to improve a product. ***Designing*** **Year 2**: Use different decorative techniques and evaluate their own and other's product.
Prior Learning	**Prior Learning**	**Prior Learning**	**Prior Learning**	**Prior Learning**
Draw and paint using a range of materials, tools and techniques, experimenting with colour, design, texture, form and function.	*Set and work towards simple goals. Draw and paint using a range of materials, tools and techniques, experimenting with colour, design, texture, form and function.*	*Use a range of small tools, including scissors, paint brushes and cutlery*	*Use a range of small tools, including scissors, paint brushes and cutlery*	*Use a range of small tools, including scissors, paint brushes and cutlery*

Year 1/2 DT Cycle A: Cooking and Nutrition – Spring Term				
Can we design and make a healthy wrap?				
Session 1	**Session 2**	**Session 3**	**Session 4**	**Session 5**
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
Can we explore the different types of food groups?	*What does a balanced diet look like?*	*How can taste testing help us when making combination choices?*	*Can we design a healthy wrap?*	*Can we create and evaluate our healthy wrap?*
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Know the five main food groups are: carbohydrates, fruits and vegetables, protein, dairy and oils and spreads.	• Know what makes a balanced diet. • Know that 'diet' means the food and drink that a person or animal usually eats.	• Know that 'ingredients' means the items in a mixture or recipe.	• Know I should eat a range of different foods from each food group, and roughly how much of each food group.	• Know how to cut, grate, snip and spread to prepare foods. • Know to review and give a score to evaluate.
Disciplinary Skills	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**
Food and Nutrition **Year 1**: Name the different food groups **Year 2**: Explain why there are different food groups and which foods are in them groups.	***Food and Nutrition*** **Year 1**: Describe what is meant by "five a day". **Year 2**: Describe the importance of a balanced diet and what impact 'five a day' has.	***Food and Nutrition*** **Year 1**: Understand where food comes from. **Year 2**: Explain where food comes from -animals/grown and how they turn into ingredients.	***Food and Nutrition*** **Year 1:** Explain basic hygiene and cook with support. **Year 2**: Understand and apply the principles of nutrition and learn how to cook.	***Making*** **Year 1**: Prepare food safely using the correct equipment. **Year 2**: Cut, peel and grate with increasing confidence. ***Evaluating and Analysing*** **Year 2:** Discuss work making links to the planned product.
Prior Learning	**Prior Learning**	**Prior Learning**	**Prior Learning**	**Prior Learning**
What is a healthy food and what is not a healthy food.	*What is a healthy food and what is not a healthy food.*	*Testing of fruits and different ingredients using senses*	*What is a healthy food and what is not a healthy food.*	*Prepared fruit in groups with support using a range of mixing, chopping and peeling skills.*

Year 1/2 DT Cycle A: Structures – Summer Term				
Can we make a windmill?				
Session 1	**Session 2**	**Session 3**	**Session 4**	**Session 5**
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
Can we create a stable structure?	*What tools and equipment do we need to make a sail?*	*How do we attach parts of a structure?*	*Can we design an alternative windmill?*	*Are we able to evaluate the successes of our structures?*
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Know that stable structures do not topple. • Know a structure is something built for a reason.	• Know that windmills are used to generate power and were used for grinding flour.	• Know a structure is something built for a reason. • Know that adding weight to the base of a structure can make it more stable.	• Know a structure is something built for a reason. • Know that adding weight to the base of a structure can make it more stable.	• Know that windmills are used to generate power and were used for grinding flour.
Disciplinary Skills	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**
Designing **Year 1:** Measure, mark out, cut and shape materials and components with support. **Year 2**: Measure accurately, cut and shape materials independently.	***Technical Knowledge*** **Year 1**: Describe the tools being used and why. **Year 2:** Choose suitable materials and explain choices linked to characteristics.	***Technical Knowledge*** **Year 1**: Use joining, rolling or folding to make things stronger **Year 2**: Use different ways to make things stronger, explain why you used them and use finishing techniques to make products look good.	***Evaluating and Analysing*** **Year 1**: Explain own ideas and products before explaining what to do next with support. **Year 2**: Explain choice of textiles. **Year 2:** Have own ideas and plan what to do next.	***Evaluating and Analysing*** **Year 1**: Talk about what could make a product better and what could have been done differently **Year 2**: Describe what went well thinking about design criteria.
Prior Learning	**Prior Learning**	**Prior Learning**	**Prior Learning**	**Prior Learning**
Use 3D shapes to make model cottage, bridge, henhouse.	*Use 3D shapes to make model cottage, bridge, henhouse.*	*Made a moving vehicle using wheels.*	*Designed models using a plan in the areas, usually construction.*	*Label and talk about their model.*

Year 1/2

Cycle B

DT Sequences of Learning

Topics of Study: Mechanisms, Cooking and Nutrition, Mechanisms	**Term: All**	**Year:** 1/2 Cycle B

National Curriculum	**Key Substantive Knowledge**
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 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.	**Mechanisms** • Know a mechanism is the parts of an object that move together. • Know a slider mechanism moves an object from side to side or up and down. • Know a slider mechanism has a slider, slots, guides and an object. • Know that bridges and guides are bits of card that purposefully restrict the movement of the slider. **Cooking and Nutrition** • Know that a blender is a machine which mixes ingredients together into a smooth liquid. • Know that fruit has seeds and a vegetable does not. • Know that fruits grow on trees or vines. • Know that vegetables can grow either above or below ground. • Know that vegetables are any edible part of a plant. • Know what makes a balanced diet. • Know the five main food groups are: carbohydrates, fruits and vegetables, protein, dairy and oils and spreads. **Mechanisms** • Know everyday objects have mechanisms. • Know that many things that move have parts inside to help them work. • Know that mechanisms usually limit unwanted movement. • Know that everyday objects utilise wheels and axles. • Know wheels must be able to turn to work effectively. • Know that axles allow wheels to turn without falling off. • Know the features of a fairground wheel include the wheel, frame, pods, axle and axle holder.

Vocabulary
Adapt, assemble, design, design criteria, input, mechanism, model, sliders, test, blend, blender, chopping board, compare, cut, design, evaluate, flavour, fork, fruit, healthy, ingredients, juice, juicer, leaf, plant, recipe, root, seed, select, smoothie, stem, table knife, taste, tree, vegetable, vine, design brief, design criteria, evaluate, frame, model, opinion, rotate, survey.

Year 1/2 DT Cycle B: Mechanisms – Autumn Term				
Can we make a picture move?				
Session 1	**Session 2**	**Session 3**	**Session 4**	**Session 5**
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
How do sliders make things move?	*Can we design a moving picture and make it appealing?*	*How can we make a moving picture?*	*How can we make a moving picture?*	*How do I know if my moving picture is a success?*
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Know a slider mechanism moves an object from side to side or up and down. • Know a slider mechanism has a slider, slots, guides and an object.	• Know a mechanism is the parts of an object that move together.	• Know that bridges and guides are bits of card that purposefully restrict the movement of the slider.	• Know that bridges and guides are bits of card that purposefully restrict the movement of the slider.	• Know a slider mechanism moves an object from side to side or up and down. • Know a slider mechanism has a slider, slots, guides and an object.
Disciplinary Skills	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**
Designing **Year 1:** Discuss work making links to the planned product. **Year 2:** Talk about existing products considering: use, materials, how they work, audience and where they might be used.	***Designing*** **Year 1:** Design a product using simple design criteria provided. **Year 2**: Design a product and use labels for explanation. ***Evaluating and Analysing*** **Year 2:** Explain what a product is for and how it will work.	***Making*** **Year 1**: Measure, mark out, cut and shape with support **Year 2**: Suggest ways to make material/product stronger. **Year 2**: Use finishing techniques to make a product look good.	***Making*** **Year 1:** Measure, mark out, cut and shape with support **Year 2**: Suggest ways to make material/product stronger. **Year 2:** Use finishing techniques to make a product look good.	***Evaluating and Analysing*** **Year 1**: Discuss if the product is successful and what could be better. **Year 2**: Talk about existing products and explain if it was successful or not and what you could change to make it more successful.
Prior Learning	**Prior Learning**	**Prior Learning**	**Prior Learning**	**Prior Learning**
Looked at and read storybooks containing sliders.	*Set and work towards simple goals.* *Draw and paint using a range of materials, tools and techniques, experimenting with colour, design, texture, form and function.*	*Joined materials using tape, glue etc. Cut out shapes from within larger shapes.*	*Joined materials using tape, glue etc. Cut out shapes from within larger shapes.*	*Label and talk about their model.*

Year 1/2 DT Cycle B: Cooking and Nutrition – Spring Term				
Is a smoothie healthy and good for our diet?				
Session 1	**Session 2**	**Session 3**	**Session 4**	**Session 5**
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
Fruit or Vegetable?	*Where do fruit and vegetables grow?*	*Are smoothies good for us?*	*Can we make a smoothie that includes our chosen ingredients?*	*What have we learned from making our smoothies?*
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Know that fruit has seeds and a vegetable does not. • Know that vegetables are any edible part of a plant.	• Know that fruits grow on trees or vines. • Know that vegetables can grow either above or below ground.	• Know what makes a balanced diet. • Know the five main food groups are: carbohydrates, fruits and vegetables, protein, dairy and oils and spreads.	• Know that a blender is a machine which mixes ingredients together into a smooth liquid.	• Know that a blender is a machine which mixes ingredients together into a smooth liquid. • Know that vegetables can grow either above or below ground. • Know what makes a balanced diet.
Disciplinary Skills	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**
Food and Nutrition **Year 1:** Identify where some foods come from e.g. plant/animal. **Year 2:** Describe differences between some food groups.	***Food and Nutrition*** **Year 1:** Identify where some foods come from e.g. plant/animal. **Year 2:** Describe differences between some food groups.	***Food and Nutrition*** **Year 1:** Describe textures of foods. **Year 2**: Describe differences between some food groups. **Year 1:** Understand what a fruit is and what is a vegetable. **Year 2**: Discuss how fruit and vegetables are healthy	***Food and Nutrition*** **Year 1**: Work in a hygienic and safe manner. ***Making*** **Year 2**: Cut, peel and grate safely, with support. **Year 2:** Cut, peel and grate with increasing confidence.	***Evaluating and Analysing*** **Year 1**: Explain what makes a balanced diet and identify what doesn't belong in a balanced diet. **Year 2**: Describe differences between some food groups, explain what a healthy diet looks like and where we should get our foods from.
Prior Learning	**Prior Learning**	**Prior Learning**	**Prior Learning**	**Prior Learning**
Testing of fruits and different ingredients using senses	*What is a healthy food and what is not a healthy food.*	*What is a healthy food and what is not a healthy food.*	*Prepared fruit in groups with support using a range of mixing, copping and peeling skills.* *Follow simple recipe to make a food.*	*Label and talk about healthy diets.*

Year 1/2 DT Cycle B: Mechanisms – Summer Term				
Can we make a moving Ferris wheel?				
Session 1	**Session 2**	**Session 3**	**Session 4**	**Session 5**
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
Can we explore wheel mechanisms?	*Are we able to select appropriate materials to design our own Ferris Wheel?*	*What are the key parts to a Ferris Wheel?*	*How can a survey determine how we design our decorations?*	*What equipment will we use to create and attach our pods and decorate the finished product?*
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Know everyday objects have mechanisms. • Know that many things that move have parts inside to help them work.	• Know that mechanisms usually limit unwanted movement. • Know that everyday objects utilise wheels and axles. • Know wheels must be able to turn to work effectively.	• Know that everyday objects utilise wheels and axles. • Know wheels must be able to turn to work effectively. • Know that axles allow wheels to turn without falling off. • Know the features of a fairground wheel include the wheel, frame, pods, axle and axle holder.	• Know the features of a fairground wheel include the wheel, frame, pods, axle and axle holder.	• Know the features of a fairground wheel include the wheel, frame, pods, axle and axle holder.
Disciplinary Skills	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**
Designing **Year 1**: In small groups, discuss ideas how they might work. **Year 2**: Explain ideas and describe how they might be achieved.	***Designing*** **Year 1**: Have own ideas and plan what to do next. **Year 2**: Design products for self and others following design criteria. ***Making*** **Year 1 and 2**: Join materials together in different ways.	***Technical Knowledge*** **Year 1**: Use knowledge of existing products to generate ideas. **Year 2**: Explain ideas and describe how they might be achieved.	***Evaluating and Analysing*** **Year 1**: Talk about what could make a product better and what could have been done differently. **Year 2**: Talk about existing products considering: use, materials, how they work, audience, where they might be used, express personal opinion.	***Technical Knowledge*** **Year 1**: Use finishing techniques to make products look good. **Year 2**: Choose the most effective technique to improve the product. ***Making*** **Year 1 and 2**: Measure, mark out, cut and shape materials and components with support.
Prior Learning	**Prior Learning**	**Prior Learning**	**Prior Learning**	**Prior Learning**
Looked at and read storybooks containing wheels.	*Draw, paint and cut using a range of materials, tools and techniques, experimenting with colour, design, texture, form and function.*	*Joined materials using tape, glue etc. Cut out shapes from within larger shapes.*	*Class discussions and votes.*	*Label and talk about their model.*

Year 3/4

Cycle A

DT Sequences of Learning

Topics of Study: Cooking and Nutrition, Textiles, Electrical Systems	**Term: All**	**Year:** 3/4 Cycle A

National Curriculum	**Key Substantive Knowledge**
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 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.	**Cooking and Nutrition** • Know that the amount of an ingredient in a recipe is known as the 'quantity'. • Know that safety and hygiene are important when cooking. • Know the following cooking techniques: sieving, measuring, mixing/stirring, cutting out and shaping. • Know the importance of budgeting while planning ingredients for a recipe. • Know that products often have a target audience. **Textiles** • Know that a fastening is something that holds two pieces of material together. • Know how to write a design criteria for a product, articulating decisions made. • Know that different fastening types are useful for different purposes. • Know that my product is fit for purpose by sticking to a design criteria. • Know that creating a mock-up (prototype) of their design is useful for checking ideas and proportions. **Electrical Systems** • Know that electrical conductors are materials which electricity can pass through. • Know that electrical insulators are materials which electricity cannot pass through. • Know a battery contains stored electricity that can be used to power products. • Know an electrical circuit must be complete for electricity to flow. • Know a switch can be used to complete and break an electrical circuit. • Know that torches are used to generate light.

Vocabulary
Adapt, addition, appearance, budget, buttery, combine, comment, compare, construct, cream, crunchy, cuboid, cut, design, evaluate, fold, hygiene, ingredients, layout, market research, modify, multiplication, opinion, pounds, sieve, sift, target audience, taste, texture, criteria, fabric, fastening, fix, mock-up, stitch, template, battery, bulb, buzzer, circuit diagram, component, conductor, electrical item, electricity, electronic item, insulator, series circuit, switch, target audience, test, torch, wire

Year 3/4 DT Cycle A: Cooking and Nutrition				
Can we make an alternative biscuit?				
Session 1	**Session 2**	**Session 3**	**Session 4**	**Session 5**
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What do we need to test when carrying out biscuit trials?	*What techniques are used to make biscuits?*	*Can we work as a group to design a biscuit within a given budget?*	*What difference does it make to a biscuit when we add our own additional ingredients?*	*Can we set up and take part in a biscuit bake off?*
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Know that the amount of an ingredient in a recipe is known as the 'quantity'. • Know that safety and hygiene are important when cooking.	• Know the following cooking techniques: sieving, measuring, mixing/stirring, cutting out and shaping. • Know that safety and hygiene are important when cooking.	• Know the importance of budgeting while planning ingredients for a recipe.	• Know that the amount of an ingredient in a recipe is known as the 'quantity'.	• Know that products often have a target audience.
Disciplinary Skills	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**
Evaluating and Analysing **Year 3**: Begin to explain how an original design could be improved. **Year 4**: Evaluate existing products considering: how well they have been made, materials, whether they work, how they have been made, if they are fit for purpose.	***Technical Knowledge*** **Year 3**: Select suitable tools and equipment. **Year 4**: Select the right tools to use and explain choices in relation to required techniques and use accurately. ***Making*** **Year 3 and 4**: Use some of the following techniques: peeling, chopping, slicing, grating, mixing, spreading and baking.	***Evaluating and Analysing*** **Year 3**: Begin to recognise if a product is well made and works properly. **Year 4**: Evaluate how well the products are and discuss what has been used to see it is appropriate.	***Technical Knowledge*** **Year 3:** Begin to explain how an original design could be improved. **Year 4:** Understand that ingredients can be fresh, pre-cooked or processed. **Year 4**: Select appropriate materials which are fit for purpose and explain choices.	***Food and Nutrition*** **Year 3**: Consider how to present products in interesting and attractive ways. **Year 4**: Think carefully about how to present food and make decisions on finer details such as colour, decoration etc.
Prior Learning	**Prior Learning**	**Prior Learning**	**Prior Learning**	**Prior Learning**
Describe differences between some food groups. *Describe textures.*	*Cut, peel and grate safely, with support*	*Estimate, compare and calculate different measures, including money in pounds and pence – maths link.*	*Adapt and follow a recipe to make a healthy wrap.*	*Discuss work making links to the planned product.*

Year 3/4 DT Cycle A: Textiles				
How to make a book sleeve?				
Session 1	**Session 2**	**Session 3**	**Session 4**	**Session 5**
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What fastenings are being used in this room?	*Why are design criteria useful?*	*Can we create a detailed design sheet for our book sleeve?*	*Why is it useful to make and test a template before starting the final product?*	*Can we use a range of techniques to assemble, join and decorate our products?*
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Know that a fastening is something that holds two pieces of material together.	• Know how to write a design criteria for a product, articulating decisions made.	• Know that different fastening types are useful for different purposes.	• Know that creating a mock-up (prototype) of their design is useful for checking ideas and proportions.	• Know that my product is fit for purpose by sticking to a design criteria.
Disciplinary Skills	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**
Technical Knowledge **Year 3**: Begin to talk about their own ideas and how they link to what they are planning to make. **Year 3:** Begin to explain how simple products work. **Year 4**: Evaluate existing products by discussing their function, materials, and how they work. **Year 4**: Explain how products work, using correct vocabulary where possible.	***Designing*** **Year 3**: Begin to create own design criteria. **Year 4:** Show how a design meets a range of requirements and is fit for purpose.	***Making*** **Year 3:** Make choices about how to create their product using the materials available. **Year 4**: Make informed decisions about tools, techniques, and materials based on what's available. **Year 4**: Refer regularly to the design criteria to guide and improve their work during making.	***Making*** **Year 3:** Use a simple paper template to help measure, mark fabric and use scissors safely and accurately. **Year 4**: Cut fabric precisely, improving control and accuracy. Work more independently to prepare fabric for joining, following the correct sequence.	***Making*** **Year 3**: Use a needle and thread to sew fabric pieces together using simple stitches **Year 4**: Choose an appropriate stitch style (e.g., running stitch, overstitch) to join fabric, based on its purpose. Make sure to show control and care when sewing to produce a neat finish.
Prior Learning	**Prior Learning**	**Prior Learning**	**Prior Learning**	**Prior Learning**
Evaluate which materials and decorations would be fit for purpose?	*Use a template to make our 3D structure*	*Practise cutting, threading, sewing and tying with threads and fabric.* *Use a template to make our 3D structure*	*Practise cutting, threading, sewing and tying with threads and fabric.* *Respond to shapes becoming misaligned; the thread running out or a problem with the stitching.*	*Use different decorative techniques and evaluate their own and other's product.*

Year 3/4 DT Cycle A: Electrical Systems				
Can we create light using a torch?				
Session 1	**Session 2**	**Session 3**	**Session 4**	**Session 5**
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
What is electricity and how do we use it?	*What is the purpose of a torch?*	*Can we design a torch to fit a set of specific needs?*	*Can we follow steps to make and assemble a torch?*	*Is our torch fit for purpose?*
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Know that electrical conductors are materials which electricity can pass through. • Know that electrical insulators are materials which electricity cannot pass through.	• Know a battery contains stored electricity that can be used to power products.	• Know an electrical circuit must be complete for electricity to flow.	• Know a switch can be used to complete and break an electrical circuit.	• Know that torches are used to generate light.
Disciplinary Skills	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**
Making **Year 3:** Use several components in a circuit. **Year 4**: Join together different circuits and explain how to join things in different ways.	***Evaluating and Analysing*** **Year 3**: Say what materials have been used and whether they are suitable. **Year 3:** Say if the product works and what it is meant to do. **Year 4**: Judge how well a product works and if it is suitable for the intended user.	***Designing*** **Year 3**: Make and explain design decisions considering the availability of resources. **Year 4**: Include an annotated sketch with your design which explains the purpose of the product and how it will work.	***Making*** **Year 3**: Work through a plan in order. **Year 4**: Assemble, join and combine materials and components with some accuracy.	***Evaluating and Analysing*** **Year 3**: Begin to explain how an original design could be improved. **Year 4**: Learn about some inventors/designers and make conclusions on how our design could be improved using their previous work.
Prior Learning	**Prior Learning**	**Prior Learning**	**Prior Learning**	**Prior Learning**
Explored how sliders are used to make things move-side-to-side and up-and-down	*Join materials/components together in different ways.*	*Learnt more about product design criteria and selected the most materials and equipment.*	*Designed moving picture, created slider and assembled own moving story book.*	*Discuss work making links to the planned product.*

Year 3/4

Cycle B

DT Sequences of Learning

Topics of Study: Mechanisms, Mechanisms, Structures	**Term: All**	**Year:** 3/4 Cycle B

National Curriculum	**Key Substantive Knowledge**
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 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.	**Mechanisms** • Know that mechanisms are a collection of moving parts that work together as a machine to produce movement. • Know that there is always an input and an output in a mechanism. • Know that an input is the energy that is used to start something working. • Know that an output is the movement that happens because of the input. • Know that a lever is something that turns on a pivot. • Know the parts in different linkage mechanisms. • Know that a linkage mechanism is made up of a series of levers. **Mechanisms** • Know how mechanisms work. • Know a mechanical system can allow us to move something more easily. • Know that mechanical systems can have more than one mechanism that moves to make them work. • Know that mechanical systems are often hidden in products to make them look more appealing. • Know that pneumatic systems can be found in everyday objects. • Know that pushing air can be used to move a mechanism. • Know that pivots can be used to create more movement in a mechanical system. • Know a combination of mechanisms can improve a product. **Structures** • Know that wide and flat based objects are more stable. • Know the importance of strength and stiffness in structures. • Know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse – and their purpose. • Know that a facade is the front of a structure. • Know that a castle needed to be strong and stable to withstand enemy attack.

Vocabulary
Axle, design criteria, input, linkage, mechanical, output, pivot, wheel diagram, evaluate, feedback, housing, linkage, mechanical system, mechanism, pivot, pneumatic system, thumbnail sketch, 2D, 3D, castle, design, key features, net, scoring, shape, stable, stiff, strong, structure, tab.

Year 3/4 DT Cycle B: Mechanisms				
Can we create a moving Christmas card?				
Session 1	**Session 2**	**Session 3**	**Session 4**	**Session 5**
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
How do moving parts work together to create a mechanism?	*What can be found out from exploring linkage systems?*	*Can we generate two different possible ideas for a product, which both meet the design criteria?*	*What will be the best linkage system to suit our moving Christmas card?*	*How well does our picture move?*
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Know that mechanisms are a collection of moving parts that work together as a machine to produce movement. • Know that there is always an input and an output in a mechanism. • Know that an input is the energy that is used to start something working. • Know that an output is the movement that happens because of the input.	• Know that a lever is something that turns on a pivot. • Know that a linkage mechanism is made up of a series of levers.	• Know that a lever is something that turns on a pivot. • Know that a linkage mechanism is made up of a series of levers.	• Identify the parts in different linkage mechanisms.	• Know that an input is the energy that is used to start something working. • Know that an output is the movement that happens because of the input.
Disciplinary Skills	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**
Designing **Year 3**: Learn about some inventors, designers, engineers, chefs, or manufacturers who created important or interesting products. **Year 4:** Discuss how inventors' ideas have influenced the way products are made today.	***Making*** **Year 3:** Begin to assemble, join and combine materials and components with some accuracy. **Year 4:** Show increased control and precision when making products	***Designing*** **Year 3**: Creating a design criteria for a moving picture as a class. **Year 4:** Designing a moving Christmas card for a specific audience in accordance with a design criteria.	***Technical Knowledge*** **Year 3**: Apply a range of finishing techniques with some accuracy. **Year 4**: Experimenting with linkages adjusting the widths, lengths and thicknesses of card used.	***Evaluating and Analysing*** **Year 3**: Look at existing products and say how well they have been made. **Year 4:** Evaluate existing products by considering how well they have been made and the quality of materials used.
Prior Learning	**Prior Learning**	**Prior Learning**	**Prior Learning**	**Prior Learning**
Know a slider mechanism moves an object from side to side or up and down.	*Know a mechanism is the parts of an object that move together.*	*Know that bridges and guides are bits of card that purposefully restrict the movement of the slider.*	*Discuss work making links to the planned product.*	*Talk about existing products, considering: use, materials, how they work, audience and where they might be used.*

Year 3/4 DT Cycle B: Mechanisms				
Can we make a moving monster using pneumatics?				
Session 1	**Session 2**	**Session 3**	**Session 4**	**Session 5**
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
How does pneumatics work to create movement?	*Can we create a range of diagrams to summarise information?*	*How should our pneumatic toy look?*	*Can we make our toy using the correct pneumatic system?*	*Does our toy work and can we finalise ideas against the design criteria?*
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Know how mechanisms work. • Know a mechanical system can allow us to move something more easily. • Know that mechanical systems can have more than one mechanism that moves to make them work.	• Know that mechanical systems are often hidden in products to make them look more appealing.	• Know that pneumatic systems can be found in everyday objects.	• Know that pushing air can be used to move a mechanism. • Know that pivots can be used to create more movement in a mechanical system.	• Know a combination of mechanisms can improve a product.
Disciplinary Skills	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**
Evaluating and Analysing **Year 3**: Analysing why specific products, designers or inventors are successful **Year 4:** Consider how user needs and problems have influenced design choices.	***Designing*** **Year 3**: Using thumbnail sketches that are less detailed, quick sketches. **Year 4:** Adding extra information on drawings or diagrams to help the user understand a design or idea.	***Designing*** **Year 3:** Suggesting simple safety rules based on their understanding of tool dangers **Year 4:** Developing designs by adding details and justifications about materials, tools and methods.	***Making*** **Year 3**: Selecting equipment required for a series of tasks based on the plan. **Year 4**: Cutting out more complex shapes accurately with precision and independently.	***Evaluating and Analysing*** **Year 3**: Use knowledge of materials, purpose, and user needs to support their feedback. **Year 4**: Explaining why they think certain aspects of a peer's design are effective or why they suggested specific improvement.
Prior Learning	**Prior Learning**	**Prior Learning**	**Prior Learning**	**Prior Learning**
Understanding of a slider, linkage and lever.	*Know a mechanism is the parts of an object that move together.*	*Discuss work making links to the planned product.*	*Recall different types of systems used to design a toy and create one for a specific movement.*	*Evaluate how well the design, materials and equipment help to achieve the design brief.*

Year 3/4 DT Cycle B: Structures			
Can we create a castle using a solid structure?			
Session 1	**Session 2**	**Session 3**	**Session 4**
Key Question	**Key Question**	**Key Question**	**Key Question**
What is a castle and why do they need a strong and stable structure?	*What would be the best design for a castle?*	*Can we create our own castle using effective 3D nets?*	*Can we construct and evaluate our final produce?*
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Know that a castle needed to be strong and stable to withstand enemy attack.	• Know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse – and their purpose. • Know that wide and flat based objects are more stable.	• Know the importance of strength and stiffness in structures.	• Know that a facade is the front of a structure.
Disciplinary Skills	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**
Evaluating and Analysing **Year 3**: Evaluate existing products considering: how well they have been made, materials, whether they work, how they have been made, if they are fit for purpose. **Year 4:** Evaluate how well existing products have been made, considering craftsmanship and quality with a range of suggestions whether the product could be improved or redesigned.	***Evaluating and Analysing*** **Year 3**: Designing a castle with key features to appeal to a specific person/purpose. **Year 4**: Design a castle (or product) with detailed features tailored to a specific user or purpose. Explain clearly how their design will work, including how different parts function together.	***Making*** **Year 3:** Constructing a range of 3D geometric shapes using nets with support. **Year 4**: Begin to assemble, join and combine materials and components with some accuracy, whilst working independently.	***Evaluating and Analysing*** **Year 3 and 4**: Suggesting points for modification of the individual designs. ***Making*** **Year 3**: Apply a range of finishing techniques with some accuracy. **Year 4**: Apply finishing techniques carefully and accurately to improve the quality and appearance of their product.
Prior Learning	**Prior Learning**	**Prior Learning**	**Prior Learning**
Know how to strengthen structures using a base.	*Used nets and templates to make a windmill.* *Designed and made key components for a Ferris wheel structure.*	*Learnt how to strengthen using tabs and joins.* *Followed a plan to assemble.*	*Use finishing techniques to make products look good.*

Year 5/6

Cycle A

DT Sequences of Learning

Topics of Study: Textiles, Mechanisms and Electrical Systems	**Term: All**	**Year:** 5/6 Cycle A

National Curriculum	**Key Substantive Knowledge**
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 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.	**Textiles** • Know that blanket stitch is useful to reinforce the edges of a fabric material or join two pieces of fabric. • Know that it is easier to finish simpler designs to a high standard. • Know that soft toys are often made by creating appendages separately and then attaching them to the main body. • Know that small, neat stitches which are pulled taut are important to ensure that the soft toy is strong and holds the stuffing securely. **Mechanisms** • Know mechanical systems that use gears in everyday objects (e.g. bicycle, clock, etc.). • Know gears and pulleys allow us to transfer movement and force from one part of a mechanical system to another. • Know gears allow us to increase the output of a mechanism. • Know market research is a way of collecting information about problems or needs. • Know constraints are things that might stop our ideas from being successful. • Know that original and innovative ideas are different from what has been made before. • Know that annotations are detailed labels and comments on diagrams. • Know that risks are things that might happen. • Know that hot glue creates a strong bond quickly. • Know it is often better to choose safer equipment. • Know that sustainability means thinking about the materials that were used to make a product and how the product was made. • Know their final product can still be improved by different materials or techniques. • Know that evaluating their designs in detail will help them understand their successful and less successful parts. • Know that feedback should be positive, helpful and specific. **Electrical Structures** • Know that, in a series circuit, electricity only flows in one direction. • Know when there is a break in a series circuit, all components turn off. • Know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin. • Know a motorised product is one which uses a motor to function. • Know that our knowledge can help others in their creations.

Vocabulary
Accurate, annotate, appendage, blanket-stitch, design criteria, detail, evaluation, fabric, sew, shape, stuffed toy, stuffing, template, annotate, axle, force, gear, gear system, input, machine, market research, mechanism, output, problem statement, pulley, pulley system, renewable energy, research, sustainability, teeth, circuit component, configuration, current, develop, DIY, Investigate, motor, motorised, problem solve, product analysis, series circuit, stable, target user.

Year 5/6 DT Cycle A: Textiles			
Can we design and make a stuffed toy?			
Session 1	**Session 2**	**Session 3**	**Session 4**
Key Question	**Key Question**	**Key Question**	**Key Question**
How does a template help ensure that our fabric is the right shape and size?	*How can we sew strong and secure blanket stitches?*	*What is the best way to create and add decorations to fabric?*	*Can we use a strong and secure blank stitch to assemble the components of a stuffed toy?*
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Know that it is easier to finish simpler designs to a high standard.	• Know that it is easier to finish simpler designs to a high standard. • Know that small, neat stitches which are pulled taut are important to ensure that the soft toy is strong and holds the stuffing securely.	• Know that soft toys are often made by creating appendages separately and then attaching them to the main body.	• Know that blanket stitch is useful to reinforce the edges of a fabric material or join two pieces of fabric. • Know that small, neat stitches which are pulled taut are important to ensure that the soft toy is strong and holds the stuffing securely.
Disciplinary Skills	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**
Designing **Year 5:** Research and discuss how sustainable materials are. **Year 6**: Generate innovative design ideas, follow and refine a logical plan. ***Making*** **Year 5 and 6**: Measuring, marking and cutting fabric accurately and independently.	***Making*** **Year 5:** Accurately assemble, join and combine materials/components. **Year 6:** Sewing blanket stitch to join fabric. ***Evaluating and Analysing*** **Year 5:** Clearly explain how parts of design will work, and how they are fit for purpose. **Year 6**: Explain which stitches are fit for purpose and analyse why they are better than the others.	***Technical Knowledge*** **Year 5:** Accurately assemble, join and combine materials/components. **Year 6:** Accurately apply a range of finishing techniques and use techniques that involve a few steps.	***Making*** **Year 5 and 6:** Creating a 3D stuffed toy from a 2D design. ***Evaluating and Analysing*** **Year 5:** Testing and evaluating a product and giving points for further improvements. **Year 6**: Conduct thorough evaluations of existing products considering how well they've been made, materials, whether they work, how they've neem made and if they are fit for purpose.
Prior Learning	**Prior Learning**	**Prior Learning**	**Prior Learning**
Make and test a template when using fastenings.	*Pin, mark and cut out fabric.* *Use different techniques including sewing, to join and decorate.*	*Explore different types of fasteners.* *Use different techniques including sewing, to join and decorate.*	*Know that my product is fit for purpose by sticking to a design criteria.*

Year 5/6 DT Cycle A: Mechanisms				
Can you make a bike using pulleys and gears?				
Session 1	**Session 2**	**Session 3**	**Session 4**	**Session 5**
Key Question	**Key Question**	**Key Question**	**Key Question**	**Key Question**
Can we create a working gear system?	*How can we improve our gear design?*	*Can we create a working pulley system?*	*How can we design an eco-budget bike using design criteria?*	*Can we make and evaluate a bike?*
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Know mechanical systems that use gears in everyday objects (e.g. bicycle, clock, etc.). • Know gears and pulleys allow us to transfer movement and force from one part of a mechanical system to another. • Know gears allow us to increase the output of a mechanism.	• Know that original and innovative ideas are different from what has been made before. • Know that annotations are detailed labels and comments on diagrams. • Know constraints are things that might stop our ideas from being successful.	• Know gears and pulleys allow us to transfer movement and force from one part of a mechanical system to another.	• Know market research is a way of collecting information about problems or needs. • Know that risks are things that might happen. • Know that sustainability means thinking about the materials that were used to make a product and how the product was made. • Know that feedback should be positive, helpful and specific.	• Know that hot glue creates a strong bond quickly. • Know it is often better to choose safer equipment. • Know their final product can still be improved by different materials or techniques. • That that evaluating their designs in detail will help them understand their successful and less successful parts.
Disciplinary Skills	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**
Making **Year 5**: Select appropriate scissors to handle delicate cutting tasks and challenging materials. **Year 6**: Accurately assemble, join and combine materials/components.	***Designing*** **Year 5:** Try new/different ideas with confidence. **Year 6**: Writing more complex problem statements that consider multiple factors and constraints.	***Making*** **Year 5**: Select appropriate scissors to handle delicate cutting tasks and challenging materials. **Year 6:** Accurately assemble, join and combine materials/components.	***Designing*** **Year 5**: Noticing wider-reaching problems or needs in the community. **Year 6**: Identifying a wide range of needs and potential barriers through market research.	***Evaluating and Analysing*** **Year 5**: Consistently apply safety instructions and evaluating the product. **Year 6:** Assessing their designs against a more complex set of design criteria that includes functionality, aesthetics, user experience, sustainability and cost.
Prior Learning	**Prior Learning**	**Prior Learning**	**Prior Learning**	**Prior Learning**
Looked at linkage and leaver systems and the components within it.	*Learnt more about product design criteria and selected the most materials and equipment.*	*Looked at linkage and leaver systems and the components within it.*	*Conducted surveys to evaluate other products.*	*Evaluate how well the design, materials and equipment help to achieve the design brief*

Year 5/6 DT Cycle A: Electrical Systems			
Can we make a doodler using complex electrical systems?			
Session 1	**Session 2**	**Session 3**	**Session 4**
Key Question	**Key Question**	**Key Question**	**Key Question**
What are motors and how are they used in electrical products?	*Can we investigate an existing product to determine factors that affect form and function?*	*How is our design going to help us construct our doodler?*	*Can we develop a kit purposeful for another individual to assemble their product?*
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Know a motorised product is one which uses a motor to function.	• Know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin.	• Know that, in a series circuit, electricity only flows in one direction. • Know when there is a break in a series circuit, all components turn off.	• Know that our knowledge can help others in their creations.
Disciplinary Skills	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**
Making **Year 5**: Making a functional series circuit, incorporating a motor. **Year 6:** Accurately using a circuit assessing which products work more effectively than others when incorporating a motor.	***Technical Knowledge*** **Year 5**: Altering a product's form and function by tinkering with its configuration. **Year 6:** Explaining how existing products would alter the form and function of the product. Can the product then be altered and tested using different functions.	***Designing*** **Year 5**: Constructing a product with consideration for the design criteria. **Year 6**: Construct and explain how a product works and how it can be hindered by breaks in a circuit	***Designing*** **Year 5**: Breaking down the construction process into steps so that others can make the product. **Year 6:** Creating a detailed construction process with precise instructions so that the product can be followed easily.
Prior Learning	**Prior Learning**	**Prior Learning**	**Prior Learning**
Electrical conductors are materials which electricity can pass through.	*Know a battery contains stored electricity that can be used to power products.*	*Know an electrical circuit must be complete for electricity to flow.*	*Understanding products and how being prepared is essential for DIY.*

Year 5/6

Cycle B

DT Sequences of Learning

Topics of Study: Mechanical Systems, Cooking and Nutrition and Structures	**Term: All**	**Year:** 5/6 Cycle B

National Curriculum	**Key Substantive Knowledge**
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 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.	**Mechanical Systems** • Know which mechanisms are working together to make a mechanical system. • Know that there are different directions of movement. • Know that mechanisms can change one type of movement to another. **Cooking and Nutrition** • Know that 'flavour' is how a food or drink tastes. • Know that many countries have 'national dishes' which are recipes associated with that country. • Know that 'processed food' means food that has been put through multiple changes in a factory. • Know that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides. • Know what happens to a certain food before it appears on the supermarket shelf (farm to fork). • Know that it is important to self-evaluate our own skills and understand what we can improve for future recipes. **Structures** • Know and understand some different ways to reinforce structures. • Know to understand how triangles can be used to reinforce bridges. • Know that properties are words that describe the form and function of materials. • Know why material selection is important based on their properties. • Know the material (functional and aesthetic) properties of wood.

Vocabulary
Accurate, automata, axle, bench hoo, cam, cam profile, component, cross-sectional diagram, diagram, dowel, evaluate, exploded diagram, follower, form, frame, function, housing, mechanism, storefront, visual, balance, bitter, bridge method, complement, cookbook, cross-contamination, enhance, equipment, farm to fork, flavours, ingredients, method, pairing, preparation, recipe, research, salty, sour, storyboard, sweet, umami, accuracy, aesthetics, arch bridge, assemble, beam bridge, bench hook/vice, corrugation, evaluate, factors, hardwood, joints, lamination, mark out, material properties, quality of finish, reinforce, rigid, sandpaper/glasspaper, softwood, stability, stiffness, strength, technique, tenon saw/coping saw, truss bridge, visual appeal, wood file/rasp, wood sourcing

Year 5/6 DT Cycle B: Mechanical Systems			
Can we make an automata toy?			
Session 1	**Session 2**	**Session 3**	**Session 4**
Key Question	**Key Question**	**Key Question**	**Key Question**
Can we create a design criteria to meet a user's needs?	*How can an exploded diagram help assemble a frame?*	*Can we use CAMS to inform a design decision?*	*Can we add finishing touches and evaluate our design?*
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Know that mechanisms can change one type of movement to another.	• Know that there are different directions of movement.	• Know which mechanisms are working together to make a mechanical system.	• Know which mechanisms are working together to make a mechanical system.
Disciplinary Skills	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**
Designing **Year 5:** Clearly explain how parts of design will work, and how they are fit for purpose. **Year 5**: Accurately measure, mark out, cut and shape materials/components. **Year 6**: Cutting jelutong or other harder wood with a coping saw or a tenon saw in small groups.	***Making*** **Year 5:** Select appropriate materials, fit for purpose, explain choices, considering functionality and aesthetics. **Year 6:** Create, follow and adapt detailed step-by-step plans.	***Making*** **Year 5:** Select appropriate materials, fit for purpose, explain choices, considering functionality and aesthetics. **Year 6**: Cutting jelutong or other harder wood with a coping saw or a tenon saw in small groups	***Evaluating and Analysing*** **Year 5 and 6:** Incorporating feedback from peers or users to improve their product further, explaining the changes they made and the impact they had
Prior Learning	**Prior Learning**	**Prior Learning**	**Prior Learning**
Learnt more about product design criteria and selected the most materials and equipment.	*Looked at linkage and leaver systems and the components within it.*	*Looked at linkage and leaver systems and the components within it.*	*Evaluate how well the design, materials and equipment help to achieve the design brief*

Year 5/6 DT Cycle B: Cooking and Nutrition			
Come dine with me.			
Session 1	**Session 2**	**Session 3**	**Session 4**
Key Question	**Key Question**	**Key Question**	**Key Question**
Can we use our taste buds to experiment with a range of flavours?	*What will we research to design a three-course meal?*	*Can we prepare and make our three-course meal using culinary skills and knowledge?*	*What criteria could we use to evaluate and score our own dishes?*
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Know that 'flavour' is how a food or drink tastes. • Know that many countries have 'national dishes' which are recipes associated with that country.	• Know that 'processed food' means food that has been put through multiple changes in a factory. • Know what happens to a certain food before it appears on the supermarket shelf (farm to fork).	• Know that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides.	• Know that it is important to self-evaluate our own skills and understand what we can improve for future recipes.
Disciplinary Skills	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**
Food and Nutrition **Year 5**: Adapting a recipe based on research. Taste testing and scoring final products. **Year 6:** Adapt and improve a recipe after research and testing products.	***Food and Nutrition*** **Year 5**: Writing a recipe, explaining the key steps, method and ingredients. **Year 5**: Learn about food processing methods. **Year 6**: Explain the food processing methods and which foods will have a greater taste and why.	***Food and Nutrition*** **Year 5:** Prepare and cook a variety of dishes safely and hygienically. **Year 6:** Use of range of techniques confidently such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking.	***Evaluating and Analysing*** **Year 5 and 6**: Test and evaluate final product: explain what would improve it and the effect different resources may have had.
Prior Learning	**Prior Learning**	**Prior Learning**	**Prior Learning**
Know that the amount of an ingredient in a recipe is known as the 'quantity'.	*Know the importance of budgeting while planning ingredients for a recipe.* *Know that the amount of an ingredient in a recipe is known as the 'quantity'.*	*Know the following cooking techniques: sieving, measuring, mixing/stirring, cutting out and shaping.* *Know that safety and hygiene are important when cooking.*	*Know that products often have a target audience.*

Year 5/6 DT Cycle B: Structures			
Can we build a bridge?			
Session 1	**Session 2**	**Session 3**	**Session 4**
Key Question	**Key Question**	**Key Question**	**Key Question**
What are beam and arch bridges?	*What are truss bridges?*	*Can we use our understanding of bridge structures to create wooden truss bridges?*	*Can we assemble all our pieces to form and reassemble a truss bridge?*
Key Knowledge	**Key Knowledge**	**Key Knowledge**	**Key Knowledge**
• Know and understand some different ways to reinforce structures.	• Know to understand how triangles can be used to reinforce bridges. • Know that properties are words that describe the form and function of materials.	• Know why material selection is important based on their properties. • Know the material (functional and aesthetic) properties of wood.	• Know why material selection is important based on their properties.
Disciplinary Skills	**Disciplinary Skills**	**Disciplinary Skills**	**Disciplinary Skills**
Designing **Year 5**: Research how sustainable materials are **Year 6:** Talk about some inventors/ designers/ engineers' /chefs'/ manufacturers of ground-breaking products. ***Making*** **Year 5:** Making a range of different shaped beam bridges. **Year 6:** Choose the correct materials to accurately make a variety of different shaped bridges and explain why your choice is effective.	***Making*** **Year 5:** Mostly assemble, join and combine materials/components accurately. **Year 6:** Using triangles to create truss bridges that span a given distance and support a load.	***Technical Knowledge*** **Year 5:** Select appropriate materials fit for purpose; explain choices, considering functionality **Year 6**: Designing a stable structure that can support weight and explain why that design will be beneficial.	***Evaluating and Analysing*** **Year 5 and 6**: Test and evaluate final product. **Year 5**: Evaluate the quality of a design while designing and making. **Year 6:** Identifying where a structure needs reinforcement and using card corners for support.
Prior Learning	**Prior Learning**	**Prior Learning**	**Prior Learning**
Explain how a product will work	*Begin to assemble, join and combine materials and components with some accuracy.*	*Constructing a range of 3D geometric shapes using nets.* *Making facades from a range of recycled material.*	*Suggesting points for modification of the individual designs.* *Apply a range of finishing techniques with some accuracy.*