Progression of Design and Technology

<table>
<tr><th></th><th>KNOWLEDGE</th><th>PERFORMANCE OF SKILLS</th></tr>
<tr><td rowspan="4">Year 1&2

Cycle A</td><td><u>Unit: Structures</u>
Freestanding structures using new and reclaimed materials (cardboard boxes, card, straws, cotton reels)

Task: Making furniture or items from a story book (bridge from 3 Billy Goats Gruff or a chair for the 3 little pigs) etc…</td><td rowspan="4">All children (WTS)
➢ Design: Suggest an idea by talking.
➢ Make: Pick a tool to use from a selection.
➢ Make: With support, cut and shape materials.
➢ Make: Find ways to join materials together.
➢ Evaluate: To give one reason why they liked / disliked their product.

Most children (EXS)
➢ Design: Develop ideas by talking and drawing.
➢ Make: Select from a range of given tools and equipment explaining their choices.
➢ Make: Cut and shape materials.
➢ Make: Select and explain why they have chosen reclaimed / new materials for each part of their structure.
➢ Make: Assemble, join and combine components.
➢ Evaluate - To say what they like and dislike about other products and their own.

Some children (GDS)
➢ Design: Develop ideas by talking in detail about what they want their product to do / look like. Add labels to drawings.
➢ Make: Choose from a range of given tools and equipment and be able to discuss and reason their choices in the context of the task (I used tape because it is stronger than… so it will hold my structure and make it more stable etc..)
➢ Make: Show some accuracy when cutting and shaping materials.
➢ Make: Assemble, join and combine components and explain what they are doing any why.
➢ Evaluate - To use detail when saying what they like and dislike about other products and their own.</td></tr>
<tr><td>Key Vocabulary
Reclaimed, materials, freestanding, structures, firmer, strong, weak, stable, base, thinner, thicker, surface</td></tr>
<tr><td>Prior knowledge
In the Early Years children have:
✓ Developed their small motor skills so that they can use a range of tools competently, safely and confidently.
✓ Designed and/or made things for other people and children would have been asked what they think the user would like/need.
✓ Chosen the right resources to carry out their own plan.
✓ Used one-handed tools and equipment, for example, making snips in paper with scissors.
✓ Combined shapes to make new ones - an arch, a bigger triangle etc.
✓ Joined different materials and explored different textures.</td></tr>
<tr><td>➢ To know what a structure is and what purpose it has.
➢ To know who they are building their structure for and why.
➢ To know about the simple working characteristics of different materials.
➢ To know how freestanding structures can be made stronger, firmer, stiffer and more stable.</td></tr>
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Year 1&2

Cycle A

Unit: Mechanisms

Sliders / levers

Task: Making a story book.

Key Vocabulary

Slider, Lever, pivot, slot, bridge/guide, paper fastener, join, left, right, forwards, backwards, up and down

Prior knowledge

In the Early Years children have:

- ✓ Explored how things work.
- ✓ Manipulated different materials, such as card, into different shapes.
- ✓ Early experiences of working with paper and card to make simple flaps and hinges.
- ✓ Experience of simple cutting, shaping and joining skills using scissors, glue, paper fasteners and masking tape.

- To know what a slider and lever is and how they are used.
- To know about the simple mechanisms of sliders.
- Understand that different mechanisms produce different types of movement.
- Know and use technical vocabulary relevant to the project.

All children (WTS)

- **Evaluate:** Make simple observations about existing products (books).
- **Design:** Create a basic design criteria based on ideas given.
- **Design:** With support, create a mock up using paper.
- Be able to say what things they can do to make their product look finished.
- **Evaluate:** Say whether their products met each of their design criteria or not.

Most children (EXS)

- **Evaluate:** Evaluate and explore a range of existing books and everyday products that use simple sliders and levers by observing and saying how they work.
- **Design:** Develop, model and communicate their ideas through drawings and mock-ups with card and paper.
- **Make:** When making, plan by suggesting what to do next.
- **Make:** Select and use tools, explaining their choices, to cut, shape and join paper and card.
- **Make:** Use simple finishing techniques.
- **Evaluate**: Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets their design criteria.

Some children (GDS)

- **Evaluate:** Evaluate, in detail, a range of existing books and everyday products that use simple sliders and levers by observing and saying how they work. Children should also be able to say how they suit the user they are aimed at.
- **Design**: Generate ideas based on a design criteria that they have generated from their research into similar products.
- **Make:** When making, plan by suggesting what to do next and to make changes if things go wrong in the making process.
- **Make:** Use and select tools with some level of accuracy, explaining their choices, to cut, shape and join paper and card.
- **Make:** Use finishing techniques to create an appealing product for their user.
- **Evaluate**: Evaluate their product in detail against their design criteria.

Year 1 & 2 Cycle A	**Unit: Food Technology** **Fruit Smoothies**	**All children (WTS)** ➢ **Evaluate:** Say what they liked / disliked about the fruits they see / feel / taste. ➢ **Design:** Use simple drawings to design. ➢ **Make:** With support, cut and peel with a table knife / swivel peeler. ➢ **Make:** Be able to follow an instruction given by an adult. ➢ **Evaluate** - Say whether their products met each of their design criteria or not. ➢
	Key Vocabulary Flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet. **Sensory vocabulary -** Soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard.	**Most children (EXS)** ➢ **Design** - Generate initial ideas and design criteria through investigating a variety of fruit. ➢ **Make:** Select from a range of fruit according to their characteristics e.g. colour, texture and taste to create their chosen product. ➢ **Make:** Follow a simple recipe with the support of an adult. o **Cut:** To cut low resistance foods with a table knife. o **Peel:** To peel with a swivel peeler with adult support. o **Mix / stir:** Thoroughly mix / stir to combine all ingredients together. ➢ **Evaluate:** Evaluate ideas and finished products against design criteria, including intended user and purpose.
	Prior knowledge **In the Early Years children have:** ✓ Experience of common fruit and vegetables, undertaking sensory activities i.e. appearance taste and smell. ✓ Experience of cutting soft fruit and vegetables using appropriate utensils.	
	➢ Understand where a range of fruit and vegetables come from e.g. farmed or grown at home. ➢ Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of *The eatwell plate.* ➢ Know and use technical and sensory vocabulary relevant to the project.	**Some children (GDS)** ➢ **Design:** Generate initial ideas and design criteria through investigating a variety of fruit – be able to evaluate and analyse against the user. ➢ **Make:** ➢ Independently, follow a simple recipe. ➢ Show control and skill when cutting low resistance foods with a table knife. ➢ Show control when peeling with a swivel peeler. ➢ **Evaluate:** Give detailed evaluations against the design criteria.

Year 1&2 Cycle B	**Unit: Mechanisms** Wheels and axles - Explore and use wheels and axles in a product. **Task** – Create a moving toy / vehicle **Key Vocabulary** Vehicle, wheel, axle, axle holder, chassis, body, cab, assembling, cutting, fixing, shaping, fixed, free, moving, friction, dowel **Prior knowledge** **In the Early Years children have:** ✓ Explored moving vehicles through play ✓ Gained some experience of designing, making and evaluating products for a specified user and purpose ✓ Developed some cutting, joining and finishing skills with card ➢ To know about the simple mechanisms of wheels and axles ➢ To know how wheels and axles are used in everyday life ➢ Distinguish between fixed and freely moving axles. ➢ Know and use technical vocabulary relevant to the project ➢ Know and explain how the product will work	**All children (WTS)** ➢ **Design:** With support, develop and communicate ideas through drawings. ➢ **Evaluate -** Use numbers / faces to evaluate wheeled products ➢ **Make** – Choose a suitable component based on shape ➢ **Make -** Use tools, with support, to cut and join ➢ **Evaluate:** Rate their product using a number scale and give one reason why they liked it / disliked it **Most children (EXS)** ➢ **Evaluate:** Explore and evaluate a range of wheeled products. ➢ **Design:** Model ideas by exploring components, using construction kits. ➢ **Design** - Develop and communicate ideas through drawings ➢ **Make:** Select from a range of materials and components according to their characteristics (waterproof, strong etc…) ➢ **Make:** Select from and use a range of tools and equipment to perform practical tasks such as cutting and joining to allow movement and finishing. ➢ **Evaluate:** Use knowledge of other products and who they are for to help them evaluate their own projects. **Some children (GDS)** ➢ **Evaluate:** Evaluate a range of wheeled products and think about how they are suited to the user and purpose. ➢ **Design** - Develop and communicate ideas through detailed drawings and annotations – could use different views. ➢ **Make:** Select from a range of materials, components and tools and be able to eplain in detail why they were chosen. ➢ Show a level of independent accuracy when performing cutting and joining tasks. ➢ **Evaluate:** Provide detailed evaluations and compare their product to other similar products.

Year 1&2 Cycle B	**Unit: Food Technology** Use the basic principles of a healthy and varied diet to prepare a dish. **Task:** To create a healthy Salad	**All children (WTS)** ➢ **Evaluate:** To say whether you like or dislike a product using images / symbols ➢ **Design:** Use a simple ICT programme to draw an idea ➢ **Make:** With support of an adult: ➢ **Cut:** To cut low resistance foods with a large handled knife and use a fork to secure foods when cutting ➢ **Grate:** To grate soft foods (such as cheese and cucumber) ➢ **Measure:** Measure ingredients up to a given line on a scale / measuring jug ➢ **Evaluate:** Ask simple yes/ no questions to gain some peer feedback about their product **Most children (EXS)** ➢ **Evaluate:** Use a sensory evaluation to look at current salad products. ➢ **Design:** Use computing to communicate and develop their ideas. ➢ **Make:** Carry out instructions with little support when cooking. ➢ **Cut:** To cut low resistance foods with a table knife and use a fork to secure foods when cutting. ➢ **Grate:** To grate soft foods (such as cheese and cucumber). ➢ **Measure:** Use simple fractions to measure ingredients (half, quarter etc…). ➢ **Evaluate:** Suggest how their designs/products could be improved based on feedback from peer reviews of the product. **Some children (GDS)** ➢ **Make:** Show accuracy and skill when: ➢ **Cutting:** low resistance foods with a table knife and use a fork to secure foods when cutting. ➢ **Grating:** To decide which part of the grater to use for different textures / appearances ➢ **Measuring:** start to use more concise measuring methods. ➢ **Evaluate:** Suggest what changes they would make to their product based on peer feedback. Children to think of their own questions to ask.
	Key Vocabulary **Salad, nutrients, vegetables, pith, dice, slice, grate, peel**	
	Prior knowledge **In the Early Years children have:** ✓ Experience of common fruit and vegetables, undertaking sensory activities i.e. appearance taste and smell. ✓ Experience of cutting soft fruit and vegetables using appropriate utensils.	
	➢ Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of *The 'eatwell plate'*. ➢ Know and use technical and sensory vocabulary relevant to the project. ➢ Know where the products have come from. ➢ Know how diet is a key part of maintaining a healthy lifestyle.	

Year 1& 2

Cycle B

Unit: Textiles
Templates and joining techniques.

Task – Christmas decorations

Key Vocabulary
Mock-up, template, pattern pieces, fabric, join, embroider, sew, seam, applique

Prior knowledge
In the Early Years children have:

- ✓ Explored and used different fabrics
- ✓ Cut and joined fabrics with simple techniques
- ✓ Thought about the user and purpose of products
- ✓ Talk about and identify the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs' etc.

- ➢ Understand how simple 3-D textile products are made, using a template to create two identical shapes.
- ➢ Understand how to join fabrics using different techniques e.g. running stitch, glue, stapling.
- ➢ Know and explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons.
- ➢ Know and use technical vocabulary relevant to the project.

All children (WTS)

- **Evaluate:** Look at products and name some differences between what they are made out from
- **Design:** Make a simple template using a guide
- **Make:** Use a simple fastening technique – glue, staple
- **Evaluate:** Be able to say whether they achieved / did not achieve each of their design criteria

Most children (EXS)

- ➢ **Evaluate:** Begin to evaluate materials used and linking this to what products in the real world are made from
- ➢ **Design:** Model ideas by exploring components, making templates and mock-ups.
- ➢ **Make:** Use suitable fastening techniques – fabric glue, staples, simple stitch if able
  - Be able to say how they will make the product suitable for the user
  - Use finishing techniques to make a product look appealing
  - Measure, mark out, cut and shape materials and components
- ➢ **Evaluate**: Make simple judgements about their designs and products with direct reference to a success criteria/design brief.

Some children (GDS)

- ➢ **Design:** Make templates and mock-ups and explain what changes you will make based on how they turn out.
- ➢ **Make:** Select from and use textiles according to their characteristics – wash proof, strong etc.
  - Show control and accuracy when measuring, cutting and shaping materials.
  - Some children may use a simple stitch as a joining technique.
- ➢ **Evaluate**: Make detailed judgements about their designs and products with direct reference to a success criteria/design brief.
  - Evaluate throughout and make immediate changes during the making process depending on outcome.

Year 3&4

Cycle A

Unit: Textiles

Turn a 2-D shape to a 3D product

Task: Produce a wallet / purse / bag

Key Vocabulary:

Fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance, pattern pieces, mock-up, prototype

Prior knowledge:

- ✓ Have joined fabric in simple ways by gluing, stapling and using a simple stitch.
- ✓ Have used simple patterns and templates for marking out.
- ✓ • Have evaluated a range of textile products.

- Know how to strengthen, stiffen and reinforce existing fabrics.
- Understand how to securely join two pieces of fabric together.
- Understand the need for patterns and seam allowances.
- Know and use technical vocabulary relevant to the project.
- Know about the key designers and how they impacted the world with their designs / products:
  - Coco Channel
  - Charles Mackintosh

All children (WTS)

- **Evaluate:** Say one way how Coco Chanel changed / improved how handbags are made.
- **Design:** Know who their intended user is and what the purpose of their product will be.
  - Produce simple sketches and, with support, create a prototype.
- **Make:**
  - Say what is good / bad about the fabric they have chosen.
  - Use a simple stitch with support to join material together.
- **Evaluate:** Ask simple questions to other people to understand what they liked / disliked about their product.

Most children (EXS)

- **Evaluate:** Research and evaluate how a key event/individual has influenced the development of the chosen product – Coco Chanel – Revolutionised handbags by adding the first ever shoulder strap.
- **Design:**
  - Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s.
  - Produce annotated sketches, prototypes, final product sketches and pattern pieces.
- **Make:**
  - Select fabrics and fastenings according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern.
  - To use a running stitch and backstitch when joining their materials.
  - Measure, mark out and cut materials with increased accuracy and independence
- **Evaluate**:
  - Test their product against the original design criteria and with the intended user.
  - Take into account others' views.

Some children (GDS)

- **Design:** Use prototypes and pattern pieces and analyse these in detail to know how to improve the final product.
- **Make:** Focus on the finishing technique – ensure the product looks appealing and impressive.
- **Evaluate**: Analyse and test the product throughout the making process – making immediate changes as needed.
  - Explain how it suits the user and how it could be improved further.

Year 3&4 Cycle A	**Unit: Structures** Shell structures using CAD (Computer Aided Design) **Task: Make gift boxes / packaging for Valentine's Day Mother's Day (or another special occasion).**	**All children (WTS)** ○ **Design:** Work collaboratively, with the support of their peers to use CAD. ○ **Make:** Be able to cut out a net using a pair of scissors independently. ○ **Evaluate:** Say what they liked / disliked about their final product. **Most children (EXS)** ➢ **Evaluate:** Evaluate existing shell structures and research the designers that made them (look at key designers for this unit). ➢ **Design:** ○ Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and the functional and aesthetic purposes of the product. ○ Develop ideas through the analysis of existing shell structures and use computer-aided design to model and communicate ideas. ➢ **Make:** ○ Plan the order of the main stages of making – use a flow chart. ○ Select and use appropriate tools and software to measure, mark out, cut, score, shape and assemble with some accuracy. ○ Use computer-generated finishing techniques suitable for the product they are creating. ➢ **Evaluate**: ➢ Test and evaluate their own products against design criteria and the intended user and purpose. **Some children (GDS)** ➢ **Design:** Show a high level of competence when navigating CAD programmes to create a realistic idea for a product. ➢ **Make:** Show a high level of accuracy and need little support when using tools and shaping their product. ➢ **Evaluate**: Investigate and evaluate a range of shell structures including the materials, components and techniques that have been used.
	Key Vocabulary: **Shell structure, three-dimensional (3-D) shape, net, length, width, breadth, capacity, marking out, scoring, shaping, tabs, adhesives, reduce, reuse, recycle, corrugating, ribbing.**	
	Prior knowledge: ✓ Experience of using different joining, cutting and finishing techniques with paper and card. ✓ A basic understanding of 2-D and 3-D shapes in mathematics and the physical properties and everyday uses of materials in science. ✓ • Familiarity with general purpose software that can be used to draw accurate shapes, such as Microsoft Word, or simple computer-aided design (CAD), such as 2D Primary by Techsoft.	
	➢ Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes. ➢ Develop and use knowledge of how to construct strong, stiff shell structures. ➢ Know and use technical vocabulary relevant to the project. ➢ Know about the key designers and how they impacted the world with their designs / products: ○ Jorn Utzon (Sydney Opera House) ○ Maria Beaseley (Designed first raft shell structure) ○ Richard Cadbury (dual purpose chocolate boxes – holds chocolate and then box used after for holding mementos)	

Year 3&4 Cycle A	**Unit: Food Technology** Healthy and Varied diet **Task: Healthy Lunch boxes for School children (dips and dippers, sandwiches, pittas)**	**All children (WTS)** ○ **Design:** Discuss an idea for a product. ○ **Make:** Cut food products with adult support. ○ Spread ingredients with adult / peer support. ○ **Evaluate:** Say what went well and what could be improved – use a taste test. **Most children (EXS)** ○ **Evaluate:** ○ Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables ➢ **Design:** ○ Generate and clarify ideas through discussion with peers and adults to develop design criteria. ○ Use annotated sketches and appropriate information and communication technology, such as web-based recipes, to develop and communicate ideas. ○ **Make:** ○ Plan the main stages of a recipe. ○ Select and use appropriate utensils and equipment to prepare and combine ingredients. ○ **Cut:** Medium resistance foods with a vegetable knife (cucumbers) ○ Use the claw grip to secure foods when cutting. ○ **Spread:** Spread ingredients evenly over another food. ○ Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics. ➢ **Evaluate**: ○ Evaluate the ongoing work and the final product with reference to the design criteria and the views of others. **Some children (GDS)** ➢ **Design:** Use knowledge / research of healthy diets to implement this into their own design ideas. Explain, in detail, why their product is healthy. ➢ **Make:** Show an increased level of skill and independence when using kitchen utensils. ➢ **Evaluate**: Gather data to analyse final product. Children to create their own questionnaires to analyse / evaluate their product.
	Key Vocabulary **Names of products, names of equipment, utensils, techniques and ingredients. Texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury, hygienic, edible.**	
	Prior knowledge: ✓ Know some ways to prepare ingredients safely and hygienically. ✓ Have some basic knowledge and understanding about healthy eating and *The eatwell plate.* ✓ • Have used some equipment and utensils and prepared and combined ingredients to make a product.	
	➢ Know how to be safe in the kitchen. ➢ Know what a healthy and varied diet means – understand portion sizes using the eatwell plate. Look at how Jamie Oliver promoted and improved school dinners / lunches for children. ➢ Know who John Montagu (invented the sandwich) and Sir James Dewar (invented the vacuum flask) are and understand how their inventions helped to shape the world.	

Year 3&4 Cycle B	**Unit: Food Technology** Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. **Task: Seasonal Soups**	**All children (WTS)** ➢ **Design:** ➢ Generate design criteria. ➢ Be able to name some fresh products that they can add to their soup. ➢ **Make:** ➢ Peel foods with a swivel peeler and use a measuring jug – both with support of an adult. ➢ **Evaluate:** ➢ Say what went well and what should be improved if you make it again. ➢ Use ticks / smiley faces to assess their product with peers. **Most children (EXS)** ➢ **Evaluate:** Carry out sensory evaluations to analyse existing products. ➢ **Design:** ○ Generate realistic ideas which focus on the needs of the user when designing a product. ○ Make design decisions that take into account the availability of resources. ➢ **Make:** ○ Adapt a simple recipe. ○ Peel foods with a swivel peeler and use a measuring jug to obtain accuracy. ➢ **Evaluate**: ○ Be able to evaluate their work throughout the making process and make changes as they go. ○ Evaluate a product using a peer group. **Some children (GDS)** ➢ **Design:** ➢ Gather information about existing products available and use this information to help make their own product based on popular opinions / products. ➢ **Make:** ➢ Be able to select their own utensils and use them with accuracy. ➢ **Evaluate**: ➢ Use peer evaluations to analyse their product in detail.
	Key Vocabulary **Appearance, texture, sensory evaluation, processed food, Reared food, caught food, swivel peeler, measuring jug, seasonality.**	
	Prior knowledge: ✓ Know that foods come from different places. ✓ Will be able to name some vegetables. ✓ • Have used some equipment and utensils and prepared and combined ingredients to make a product.	
	➢ Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. ➢ To know that food products can be fresh, prepacked or processed. ➢ Know about the key designers and how they impacted the world with their designs / products: ○ **Henry J Heinz** - (Creator of Heinz food company – including tinned soups) ○ **Heston Blumenthal** - (molecular cooking- 3 Michlin stars) ○ **Madhur Jaffrey** - (CBE for services to cultural relations)	

Year 3&4

Cycle A

Unit: Electrical Systems (Structural skills too for the bridges)

Simple circuits and switches

Task: Siren / noise to act as a warning as a bridge goes up to allow the boats to go through

Key Vocabulary

Series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip. Names of bridges: drawbridge, bascule bridge, folding bridge, vertical lift bridge, retractable bridge, tilt bridge, swing bridge.

Prior knowledge:

- ✓ Constructed a simple series electrical circuit in science, using bulbs, switches and buzzers.
- ✓ Cut and joined a variety of construction materials, such as wood, card, plastic, reclaimed materials and glue.

- Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers.
- To know how simple electrical circuits and components can be used to create functional products.
- Know and use technical vocabulary relevant to the project.
- Know about the key designers and how they impacted the world with their designs / products:
  - Annie Easley – helped develop battery technology used for hybrid vehicles.
  - John Robison – designed the first siren.
  - Isambard Kingdom Brunel – Inventor of many famous bridge

All children (WTS)

- **Design:**
  - Use annotated drawings to sketch ideas.
- **Make:**
  - With support, make a simple circuit for their bridge.
- **Evaluate:**
  - Use the design criteria to tick off what went well and what they did not achieve.

Most children (EXS)

- **Evaluate:**
  - Investigate and analyse a range of existing battery-powered alarms / sirens. Look at a range of bridges and how they move.
- **Design:**
  - Generate, develop, model and communicate realistic ideas through cross sectional drawings.
  - Explain how particular parts of their product will work.
- **Make:**
  - Order the main stages of making.
  - Select from and use tools and equipment to cut, shape, join and finish with some accuracy.
  - Select from and use materials and components, including construction materials and electrical components according to their functional properties and aesthetic qualities.
- **Evaluate:**
  - Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work.

Some children (GDS)

- **Design:**
  - Generate detailed cross-sectional drawings.
  - Use exploded diagrams to show the more complex parts of their product.
- **Make:**
  - Be able to explain what would make their circuit work / not work?
  - Make changes to their circuit to make it louder / quieter.
- **Evaluate:**

  Compare how their final product turned out against existing products.

Year 3&4

Cycle A

Unit: Mechanisms

Pneumatic systems

Task: Moving creatures / Toy (Jack in the box as an example)

Key Vocabulary

Fixing, attaching, tubing, syringe, plunger, pneumatic system, input movement, process, output movement, control, compression, pressure, inflate, deflate, pump, seal, air-tight, linear, rotary, oscillating, reciprocating

Prior knowledge:

- ✓ Explored simple mechanisms, such as sliders and levers, and simple structures.
- ✓ Learnt how materials can be joined to allow movement.
- ✓ Joined and combined materials using simple tools and techniques.

- Understand and use pneumatic mechanisms.
- Know and use technical vocabulary relevant to the project.
- Know about the key designers and how they impacted the world with their designs / products:
  - **John Boyd Dunlop –** Invented the first pneumatic tyres for a bicycle.
  - **George Westinghouse** -compressed air brake system.

All children (WTS)

- **Design:**
  - Use discussions and drawings to communicate ideas.
- **Make:**
  - Use the tools and equipment chosen for them.
  - With support, join materials and components.
  - **Evaluate:** Say what went well / not so well.

Most children (EXS)

- **Evaluate:**
  - Investigate and analyse when in time products were developed and why this is significant – Be able to say how the key inventors shaped the use of pneumatics in the world today.
- **Design:**
  - Generate realistic and appropriate ideas and their own design criteria through discussion, focusing on the needs of the user.
  - Use annotated sketches and prototypes to develop, model and communicate ideas.
- **Make:**
  - Order the main stages of making.
  - Select from and use appropriate tools with some accuracy to cut and join materials and components such as tubing, syringes and balloons.
  - Select from and use finishing techniques suitable for the product they are creating.
- **Evaluate**:
  - Be able to evaluate their own work throughout the making process. Make changes as they go.
  - Consider whether products can be recycled or reused.

Some children (GDS)

- **Design:**
  - Be able to explain how different users would require a different outcome from their product. How will they make their product suit their chosen user?
- **Make:**
  - Decide which pneumatic system will be the best for their product and explain why.
  - Independently, set up their pneumatic systems and explain what is happening.
- **Evaluate**:
  - Adapt and make changes constantly throughout the process.

Year 5&6

Cycle A

Unit: Structures

Frame structures

Task: A structure to withstand an earthquake.

Key Vocabulary

Frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent

Prior knowledge:

- ✓ Experience of using measuring, marking out, cutting, joining, shaping and finishing techniques with construction materials.
- ✓ Basic understanding of what structures are and how they can be made stronger, stiffer and more stable.

- Understand how to strengthen, stiffen and reinforce 3-D frameworks.
- Know and use technical vocabulary relevant to the project.
- Know about the key designers and how they impacted the world with their designs / products:
  - **Stephen Sauvestre** - designer of the Eiffel Tower.
  - **Adrian Smith** – designer of the Burj Khalifa – Earthquake proof.

All children (WTS)

- **Design:**
  - Say what their product needs to do and who will use it.
- **Make:**
  - Use tools, materials with support to create a frame structure.
  - Use simple joins.
- **Evaluate:**
  - Through discussion, talk about how the project went.

Most children (EXS)

- **Evaluate:**
  - Carry out research using surveys and questionnaires.
  - Research key events and individuals relevant to frame structures.
- **Design:**
  - Use exploded diagrams to show the users exactly how the product will be constructed.
- **Make:**
  - Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used.
  - Competently, select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks.
  - Use finishing and decorative techniques suitable for the product they are designing and making.
- **Evaluate**:
  - Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests.

Some children (GDS)

- **Design:**
  - Create design criteria after researching / analysing current products.
- **Make:**
  - Be able to choose and explain the joins / frame structure they chose to use – related to purpose.
  - Know how to strengthen and reinforce their product.
- **Evaluate**:
  - Explain how they would change their product if they changed the user for it.

Year 5&6

Cycle A

Unit: Food Technology

Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques

Task: Adapt a savoury dish

Key Vocabulary

Vocabulary for the senses:
Aromatic, briny, odourless, sweet, piquant, fragrant, pungent, spicy, fresh, savoury, sour, aromatic, intense, earthy etc…

Prior knowledge:

- ✓ Have knowledge and understanding about food hygiene, nutrition, healthy eating and a varied diet.
- ✓ • Be able to use appropriate equipment and utensils, and apply a range of techniques for measuring out, preparing and combining ingredients.
- ✓ Children have used a swivel peeler to peel ingredients and a measuring jug to obtain accuracy.
- ✓ Children have used the claw grip when cutting ingredients.

- Know and use relevant technical and sensory vocabulary.
- Know how to use utensils and equipment, including heat sources, to prepare and cook food.
- Understand the difference between savoury and sweet foods.
- To know what makes a dish healthy.
- Know and understand how these chefs (designers) shaped the food world:
  - **Ken Hom** – OBE services to the culinary arts.
  - **Chloe Coscarelli** – at the forefront of the vegan movement.
  - **Nikolaos Tselementes** – Influential Greek chef – Initially made the original moussaka dish.

All children (WTS)

- **Design:**
  - Explain why your dish is healthy and suited to your user.
- **Make:**
  - Cut ingredients with a wide-handled knife and with support.
- **Evaluate:**
- Ask simple yes / no questions to a sample group.

Most children (EXS)

- **Evaluate:**
  - Carry out research using interviews and web-based resources.
- **Design:**
  - Identify the needs, wants, preferences and values of particular individuals and groups.
  - Adapt a current recipe to design a new one for a chosen user group.
- Use their research to create a specific design criteria keeping their user and purpose in mind.
- **Make:**
  - Follow a recipe accurately.
  - To use digital / analogue scales accurately and independently
  - Use the claw grip and bridge hold to cut higher resistance foods.
- **Evaluate**:
- Use a sample group to analyse their product.

Some children (GDS)

- **Design:**
  - When designing think carefully about their user and the purpose of their dish. Explain how you will convince your user group to eat your dish.
- **Make:**
  - Show skill, accuracy and independence when using different equipment in the kitchen.
  - Know which equipment to use for different ingredients and explain their choices.
- **Evaluate**:
  - Create their own questionnaires for a sample group to evaluate their product.
  - Summarise key points form their sample group questionnaire.

Year 5&6

Cycle A

Unit: Textiles

Computer aided design in textiles.

To use the invisible stitch and the overcast stitch (slipstitch).

Task: Adapt and personalise a simple T-shirt (Linked to women in WW2 adapting their uniforms)

Key Vocabulary

Computer aided design (CAD), innovative, prototype, seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces, names of textiles and fastenings used, pins, needles, thread.

Prior knowledge:

- ✓ Experience of stitching (running and back stitch), joining and finishing techniques in textiles.
- ✓ Experience of making and using textiles pattern pieces.
- ✓ Experience of simple computer-aided design applications.

- Know that a 3-D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics.
- Understand that fabrics can be strengthened, stiffened and reinforced where appropriate.
- Know about the key designers and how they impacted the world with their designs / products:
  - **Alexander McQueen** - pushed the boundaries of fashion.
  - **Elspeth Champcommunal** – Fashion designer during the war – first editor of Vogue.

All children (WTS)

- **Design:**
  - To select strong suitable materials.
- **Make:**
  - With support, use a running stitch to join materials together.
- **Evaluate:**
  - Consider the views of others to improve their work.

Most children (EXS)

- **Evaluate:**
  - Investigate and analyse textile products linked to their final product.
- **Design:**
  - Develop, model and communicate ideas through templates, mock-ups and prototypes including using computer-aided design.
  - Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification.
- **Make:**
  - To select materials that have an aesthetic purpose alongside being functional.
  - Explain their choice of material and components in terms of functionality and aesthetic qualities.
  - Use a range of stitches including the overcast stitch.
- **Evaluate**:
  - Compare the final product to the original design specification.
  - Test products with intended user, where safe and practical, and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose.

Some children (GDS)

- **Design:**
  - Make design decisions, taking account of constraints such as time, resources and cost.
- **Make:**
  - Use the invisible stitch to really consider the look of the finished product.
- **Evaluate**:
  - Investigate and analyse how sustainable the materials in products are.

Year 5&6

Cycle B

Unit: Electrical Systems

Complex switches and circuits

Task: Project: Automatic / timed nightlights for an animal house.

Key Vocabulary

Series circuit, parallel circuit, names of switches and components, input device, output device, system, monitor, control, program, crumble

Prior knowledge:

- ✓ Understanding of the essential characteristics of a series circuit and experience of creating a battery-powered, functional, electrical product.
- ✓ • Initial experience of using computer control software and an interface box or a standalone box, e.g. writing and modifying a program to make a light flash on and off.

- Understand and use electrical systems in their products.
- Apply their understanding of computing to program, monitor and control their products.
- Know and use technical vocabulary relevant to the project.
- Know about the key designers and how they impacted the world with their designs / products:
  - **Garret Morgan** – invented the first 3 position traffic light.
  - Alessandro volto – Invention of the battery.
  - **Willoughby Smith** –_Inventor of the photoresistor (light dependent resistor)

All children (WTS)

- **Design:**
  - Communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams.
- **Make:**
  - With support, apply knowledge of computing to programme a computer to program, monitor and control their products.
- **Evaluate:**
  - Explain how your product works and what went well.

Most children (EXS)

- **Evaluate:**
  - Investigate and analyse how innovative products are.
  - Investigate famous inventors who developed ground-breaking electrical systems and components.
- **Design:**
  - Use cross sectional drawings to show what the product will look
- **Make:**
  - Competently select and accurately assemble recycled materials, and securely connect electrical components to produce a reliable, functional product.
  - Create and modify a computer control program to enable an electrical product to work automatically in response to changes in the environment – in this case use a light sensor so their lights turn on automatically.
- **Evaluate**:
  - Test the system to demonstrate its effectiveness for the intended user and purpose.
  - Consider the views of others to evaluate.

Some children (GDS)

- **Design:**
  - Use research to develop a design specification for a functional product that responds automatically to changes in the environment (light). Take account of constraints including time, resources and cost.
- **Make:**
  - Make a more complex set of instructions which controls their electrical product to do more than one thing.
- **Evaluate**:
  - Continually evaluate and modify the working features of the product to match the initial design specification.

Year 5&6

Cycle B

Unit: Food Technology
Celebrating culture and seasonality

Task: Making a bread which can be consumed at a special occasion (Easter)

Key Vocabulary
Ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality

Prior knowledge:
- ✓ Have knowledge and understanding about food hygiene, nutrition, healthy eating and a varied diet.
- ✓ Be able to use appropriate equipment and utensils, and apply a range of techniques for measuring out, preparing and combining ingredients.

- Know how to use utensils and equipment including heat sources to prepare and cook food.
- Understand about seasonality in relation to food products and the source of different food products.
- Know and use relevant technical and sensory vocabulary.
- Understand the cultural history of breads from around the world.
- Know about the key designers and how they impacted the world with their designs / products:
  - **Ellen and Thomas Warburton** – Founders of top bread brand Warburtons.
  - **Henry Jones** – Invented self-raising flour.
  - **Thomasina Miers** – Famous TV chef who aims to reduce food waste and encourage sustainable buying and cooking in all her restaurants

All children (WTS)
- **Design:**
  - Use words and annotated sketches to design a bread product.
- **Make:**
  - Shape the dough into different shapes and patterns.
- **Evaluate:**
  - Taste their own products and allow their sample group to taste and provide feedback.

Most children (EXS)
- **Evaluate:**
  - Understand how key chefs have influenced eating habits to promote varied and healthy diets.
  - Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations using e.g. tables/graphs/charts such as star diagrams.

• **Design:**
  - Generate innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification.
  - Explore a range of initial ideas, and make design decisions to develop a final product linked to user and purpose.
- **Make:**
  - Write a step-by-step recipe, including a list of ingredients, equipment and utensils.
  - Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients.
  - **Shape and mould:** To create visually appealing products.
  - **Knead:** Knead dough independently and understand why we do this.
- **Evaluate**:
  - Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements.

Some children (GDS)
- **Design:**
  - Use graphs to collate sensory results from taste testing and use the findings to help create their own design criteria.
- **Make:**
  - Show skill and independence and show a high level of quality in their finish.
- **Evaluate**:
  - Input data onto a star chart and analyse the results. Explain what it shows and what improvements need to be made to your product.

Year 5&6

Cycle B

Unit: Mechanical Systems
Cams

Task: A toy with oscillating, rotating or reciprocating movement

Key Vocabulary

Cam, snail cam, off-centre cam, peg cam, pear shaped cam, follower, axle, shaft, crank, handle, framework, rotation, rotary motion, oscillating motion, reciprocating motion, mechanical system, input movement, process, output movement.

Prior knowledge:

- ✓ Experience of axles, axle holders and wheels that are fixed or free moving.
- ✓ •Basic understanding of different types of movement. Experience of cutting and joining techniques with a range of materials including card, plastic and wood.
- ✓ An understanding of how to strengthen and stiffen structures.

- Understand that mechanical systems have an input, process and an output.
- Understand how cams can be used to produce different types of movement and change the direction of movement.
- Know and use technical vocabulary relevant to the project.
- Know about the key designers and how they impacted the world with their designs / products:
  - **Al-Jazari-** Invented the Camshaft
  - **Helen Blanchard** – Numerous inventions dealing with sewing machines and sewing technology which use the cam movement.
- Know how toys use camshafts and how these have changed overtime.

All children (WTS)

- **Design:**
  - Use questionnaires to carry out research.
  - Create a simple design criterion.
- **Make:**
  - Select from and use a range of tools and equipment to make products
- **Evaluate:**
  - Consider the views of others to improve their work.

Most children (EXS)

- **Evaluate:**
  - Investigate famous manufacturing and engineering companies relevant to the project.
- **Design:**
  - Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources.
  - Develop a simple design specification to guide their thinking.
  - Develop and communicate ideas through exploded drawings.
- **Make:**
  - Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team.
  - Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished.
  - Work within the constraints of time, resources and cost.
- **Evaluate**:
  - Compare the final product to the original design specification.
  - Test products with the intended user, where safe and practical, and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose.

Some children (GDS)

- **Design:**
- Develop and communicate ideas through exploded drawings and drawings from different views.
- **Make:**
- Measure accurately and decide on positioning of Cams for desired outcome and movement.
- **Evaluate**:

Create their own polls using ICT to compare everyone's finished products and their likes and dislikes of each.