Hunton & Arrathorne Community Primary School

Curriculum Document: Design Technology

INTENT - The Design & Technology Curriculum

Design and Technology is an inspiring, rigorous and practical subject.

Design and Technology encourages children to learn to think and intervene creatively to solve problems both as individuals and as members of a team.

At Hunton & Arrathorne, we encourage children to use their creativity and imagination, to design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. We aim to, wherever possible, link work to other disciplines such as mathematics, science, engineering, computing and art. The children are also given opportunities to reflect upon and evaluate past and present design technology, its uses and its effectiveness and are encouraged to become innovators and risk-takers.

The substantive concepts of Design Technology: user, purpose, functionality, design decisions, innovation and authenticity are interwoven into all aspects of our Design Technology curriculum.

In order to teach the Design Technology curriculum effectively, teachers follow the Kapow scheme of learning for Design Technology. This empowers subject leaders and class teachers with up-to-date continuous professional development and ensures progression in knowledge and skills. Each class also focuses on a key designer or technologist during each block of learning taking into account 'the very best of what's been thought and said'.

Children take part in two 'DT Days' per term with the entire day devoted to the subject; in the summer term, this always has a 'Food & Nutrition' focus.

IMPLEMENTATION - Rationale

We believe that Design & Technology should be inclusive to all. It should allow children to manage and take risks and develop their understanding of design processes – from research, initial designs, prototypes and final products.

We teach Design & Technology through 'Project Days' which are dedicated off-timetable from the rest of the curriculum and usually last two days. We hold these days twice a year. We believe that the exclusive time to focus on D&T projects allows children to gain a sufficient understanding and see links between other curriculum areas. We time these 'Project Days'
to allow visits and visitors to offer a broader range of experiential learning for our children.

To support our teaching of Design Technology, we follow the Design Technology Association's 'Projects on a Page' planning. This ensures that the substantive concepts of user, purpose, functionality, design decisions, innovation and authenticity are key features. Alongside this, we follow the Kapow scheme of learning throughout school to help support teacher subject knowledge.

Key skills and key knowledge for Design Technology have been mapped across the school to ensure progression between year groups. Due to the two-year rolling programme, pupils will cover each aspect of Design Technology e.g. textiles once in Key Stage 1, once in Lower Key Stage 2 and once in Upper Key Stage 2. They will study Food and Nutrition annually. Therefore, knowledge and skills progression is split into these age ranges. This also ensures that there is a context for the children's work in Design and Technology; that they learn about real life structures and the purpose of specific examples, as well as developing their skills throughout the programme of study. Design and Technology lessons are also taught as a block so that children's learning is focused throughout each unit of work. We utlilise our community and specialists within our local area, including visits to local manufacturers and factories, to enthuse children and ensure they see how Design Technology is used in their everyday lives and how it could be used in a future career.

DESIGN TECHNOLOGY IN EYFS

Why do we teach Design and Technology? Why do we teach it the way we do
Our Design and Technology curriculum gives our children technical and practical experiences to develop essential skills for life It enables our children to think creatively, solve problems and develop the skills needed to make finished products. In Reception, the children are actively encouraged to follow their own interests developing their own ideas. The children learn to express themselves and their own choices, developing the skills of evaluating and refining their own work.

What do we teach? What does this look like?
At our school, the children in Reception have access to continuous provision, which has high quality open-end resources. They are encouraged to plan and design what they would like to create and select the tools and resources they will need to support their choices. Highly trained practitioners support the children to learn a repertoire of skills and techniques. As well as the creative areas for junk modelling using recyclable materials in our setting the children also have access to small world and construction areas. These areas provide the children with problem-solving opportunities within Design and Technology so they can plan, design, build, evaluate and improve on their models. Throughout half termly topics such as Ourselves, Animals, Toys and Materials the children also explore different technology skills such as thinking creatively and solving problems.

What will this look like? By the time children leave our EYFS they will able to:

Physical Development

- Use a range of small tools, including scissors, paintbrushes and cutlery.

Expressive Arts & Design

- 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.

IMPLEMENTATION – Long Term Planning

* = KAPOW Unit	YEAR A			YEAR B		
	Autumn	**Spring**	**Summer**	**Autumn**	**Spring**	**Summer**
Reception	Junk Modelling* This will include opportunities to develop fine and gross motor skills and text how to fix and join different materials together. They will verbally plan and evaluate their model.	Boats* This will include opportunities to further their junk modelling skills to design and make a boat. They will begin to investigate the uses of different materials.	Soup* This will include opportunities to recognise, name and taste some common vegetables. They will find out why eating vegetables is good for us and find out how vegetables grow.	Junk Modelling * This will include opportunities to develop fine and gross motor skills and text how to fix and join different materials together. They will verbally plan and evaluate their model.	Boats* This will include opportunities to further their junk modelling skills to design and make a boat. They will begin to investigate the uses of different materials.	Soup* This will include opportunities to recognise, name and taste some common vegetables. They will find out why eating vegetables is good for us and find out how vegetables grow.
Year 1	Structures: Stable Structures *	Mechanisms: Moving Monsters *	Food and Nutrition: Wraps	Structures: Stable Structures	Mechanisms: Moving Monsters	Food and Nutrition: Wraps
Year 2	Textiles: Simple Stitches *	Mechanisms: Wheels and Axis *	Food and Nutrition: Pizza Toast	Textiles: Simple Stitches	Mechanisms: Wheels and Axis	Food and Nutrition: Pizza Toast
Year 3/4	Textiles: Fastenings (pencil case) *	Mechanisms: Mechanical Cars *	Food and Nutrition: Fruit Tart	Structures: Frame Structures	Electrical Systems: Torches *	Food and Nutrition: Savoury Rolls
Year 5/6	Textiles: Stuffed Toys *	Mechanisms: Gears and Pulleys (Fairgrounds)	Food and Nutrition: Bread	Structures: Frame Structures	Electrical Systems: Doodlers *	Food and Nutrition: Scones
Substantive Concepts	**user, purpose, functionality, design decisions, innovation and authenticity**					

KS1

Key Stage 1 National Curriculum:

Design:
- Design purposeful, functional, appealing products for themselves and other users based on design criteria.
- Generate, develop, model and communicate ideas through talking, drawing, templates, mock-ups and, where appropriate, ICT.

Make:
- Select and use a range of tools and equipment to perform practical tasks.
- Select from and use a wide range of materials and components, including construction materials, textiles and ingredients.

Evaluate:
- Explore and evaluate a range of existing products.
- Evaluate their ideas and products against a design criteria.

Technical Knowledge:
- Build structures, exploring how they can be made stringer, stiffer and more stable.
- Explore and use mechanisms in their products.

Food and Nutrition:
- Use the basic principles of a varied and healthy diet to produce dishes.
- Understand where food comes from.

Year 1			Year 2		
Autumn: Stable Structures	**Spring: Moving Monsters**	**Summer: F&N - Wraps**	**Autumn: Simple Stitches**	**Spring: Wheels and Axis**	**Summer: F&N – Pizza Toast**
Sticky Learning: - Use drawings to plan and explain ideas. - Name common pieces of equipment. - Know some products will be better than others and be able to explain why. - Build a structure which is stable and strong.	**Sticky Learning:** - Know who a user is and plan a product with the user in mind. - Select an appropriate tool to complete a task. - Evaluate their own product by saying what is good about it. - Explain how their moving monster moves.	**Sticky Learning:** - Use understanding of healthy foods to plan a healthy wrap. - Select appropriate ingredients and tools to make their wrap. - Evaluate what they liked about their product and what could be better next time. - Name some foods which are healthy/unhealthy.	**Sticky Learning:** - Choose colours and shapes for a design. - Thread a needle and make simple running stitches. - Evaluate someone else's product.	**Sticky Learning:** - Talk about ideas with user and purpose in mind. - Choose between a small number of materials and tools and use safely. - Evaluate ideas and products against their design criteria. - Understand and explain how wheels and axis work.	**Sticky Learning:** - Plan a dish using healthy ingredients. - Make their product look appealing to the user. - Evaluate the product based on both appearance and taste. - Understand that foods belong to different food groups.
Vocabulary: Base, stable, structure, unstable, freestanding	**Vocabulary:** Pneumatic, user, product, design, make	**Vocabulary:** Diet, healthy, unhealthy, ingredients, evaluate	**Vocabulary:** Stitch, fabric, finishing, running stitch, needle, thread	**Vocabulary:** Purpose, wheel, axis, mechanism, axle holder	**Vocabulary:** Appealing, food groups, carbohydrates, proteins, fruit & vegetables, dairy, fats & oils

Lower Key Stage 2

Key Stage 2 National Curriculum:

Design:

- Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups
- Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Make:

- Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately
- Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

Evaluate:

- Investigate and analyse a range of existing products
- Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- Understand how key events and individuals in design and technology have helped shape the world

Technical Knowledge:

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

Food and Nutrition:

- Understand and apply the principles of a healthy and varied diet.
- Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques.
- Understand and apply seasonality, and know where and how a range of ingredients are grown, reared, caught and processed.

Year A			Year B		
Autumn: Fastenings	Spring: Mechanical Cars	Summer: F&N – Fruit Tarts	Autumn: Structures	Spring: Torches	Summer: F&N – Savoury Rolls
Sticky Learning: - Make a paper mock-up to test a template. - Use a needle to attach a fastening. - Evaluate different fastenings to select an appropriate method. - Explain why a famous designer is so well-know.	**Sticky Learning:** - Use prototypes to influence own design ideas. - Use a wider range of tools (hot glue gun, scissors) safely. - Evaluate existing products by looking at their functionality and appeal. - Know that mechanical systems have more than one mechanism that make the product move.	**Sticky Learning:** - Develop design ideas through annotated sketches. - Select and mix more than one ingredient to make a filling. - Evaluate existing products against a set design criteria (appearance, flavours, texture, smell) - Understand seasonality and choose appropriate ingredients.	**Sticky Learning:** - Outline basic design criteria including functionality. - Select and use tools to measure, saw and join accurately. - Consider how the final product has been or could have been reinforced. - Construct a cube using appropriate materials.	**Sticky Learning:** - Design a torch with consideration for the target audience, creating own success criteria. - Make a torch with a working circuit and simple switch. - Evaluate against own success criteria. - Use a simple electrical system, including a switch.	**Sticky Learning:** - Create an exploded diagram and cross-sectional drawing to plan product. - Select ingredients which compliment one another to make a tasty product. - Evaluate existing products against a set design criteria (appearance, flavours, texture, smell). - Understand and evaluate which flavour combinations may compliment one another.
Vocabulary: Mock-up, fastening, template, attach, textile	**Vocabulary:** Prototype, bearing, chassis, force, machine, target audience	**Vocabulary:** Seasonality, appearance, flavours, texture, smell, recipe	**Vocabulary:** Functionality, reinforced, structure, net, stiffen	**Vocabulary:** - electronic item, series circuit, circuit diagram, component, conductor	**Vocabulary:** - exploded diagram, cross-sectional drawing, complement, flavour combinations, savoury

Upper Key Stage 2

Key Stage 2 National Curriculum:

Design:

- Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups
- Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Make:

- Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately
- Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

Evaluate:

- Investigate and analyse a range of existing products
- Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- Understand how key events and individuals in design and technology have helped shape the world

Technical Knowledge:

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

Food and Nutrition:

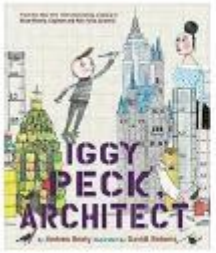
- Understand and apply the principles of a healthy and varied diet.
- Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques.
- Understand and apply seasonality, and know where and how a range of ingredients are grown, reared, caught and processed.

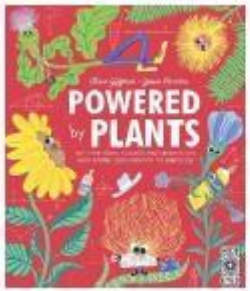
Year A			Year B		
Autumn: Stuffed Toys	Spring: Gears and Pulleys	Summer: F&N - Bread	Autumn: Frame Structures	Spring: Doodlers	Summer: F&N – Scones
Sticky Learning: - Design a stuffed toy, considering the component shapes required and appropriate template. - Apply blanket and running stitches making sure spaces are even and regular. - Test and evaluate an end-product, giving point for improvement. - Measure, mark and cut fabric accurately.	**Sticky Learning:** - Create more complex design criteria that require considering detailed user needs an, environmental impact and cost. - Cut patterns and drawings accurately. - Consider alternative materials, tools and techniques that could make the product better. - Know gears and pulleys allow us to transfer movement and force from one part of the mechanical system to the other.	**Sticky Learning:** - Use market research to inform the design process. - Make, decorate and present the food appropriately for the user and purpose. - Understand how key individuals in Design Technology have helped shape the world. - Know and use technical and sensory vocabulary.	**Sticky Learning:** - Create a technical drawing of the product to be created, including measurements. - Make marks, cuts and joins with increasing accuracy using a wider range of tools. - Critically evaluate the product against the design specification, intended user and purpose. - Know how triangulation can be used to strengthen and reinforce a structure.	**Sticky Learning:** - Break down the construction process into steps so that others could make the product. - Make a series circuit, incorporating a motor. - Provide feedback which is helpful, specific and encouraging. - Know a motorised product uses a motor to function.	**Sticky Learning:** - Explore a range of initial ideas ad explain a design decision. - Write a step-by-step recipe including ingredients, utensils and equipment. - Carry out sensory evaluations for a range of products and ingredients. Know how to use utensils and equipment including heat sources to prepare and cook food.
Vocabulary:	**Vocabulary:**	**Vocabulary:** Market research, knead, yeast, unleavened, chef	**Vocabulary:**	**Vocabulary:**	**Vocabulary:** Heat source, sensory evaluation, rubbing in, sweet

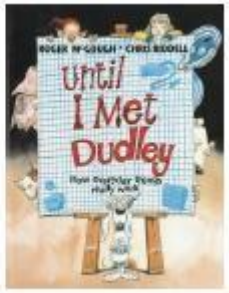
Blanket stitch, component piece, applique, measure accurately, mark accurately.	Gears, pulleys, gear system, sustainability, renewable energy.		Technical drawing, frame structure, triangulation, strengthen, reinforce, design specification	Construction process, motorised product, DIY, configuration, product analysis	ingredients, savoury ingredients

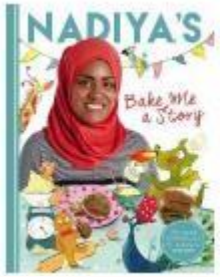
IMPLEMENTATION – Reading as Designers and Technologists…

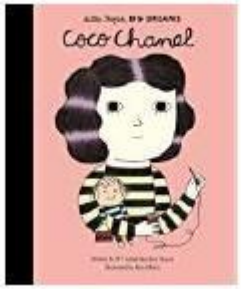
As Lifelong Readers, we want to inspire our children to ‘read as designers and technologists’. We have a carefully planned and sequenced reading spine to further engage the children and provide them with high quality texts in line with their current unit of work in Design Technology. Please see a sample of our core texts for the subject attached.

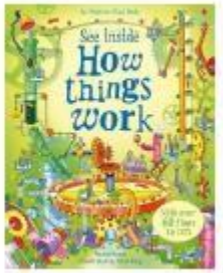


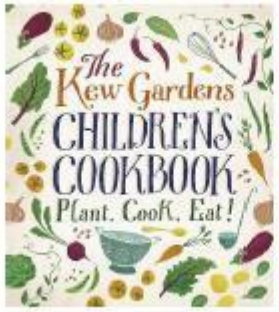


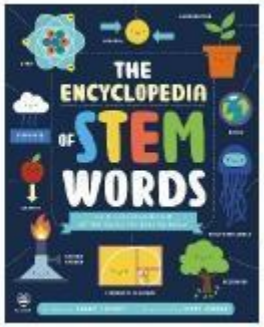












IMPACT- DESIGN TECHNOLOGY -

We ensure the children:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users and 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. Children will design and make a range of products. A good quality finish will be expected in all design and activities made appropriate to the age and ability of the child

Children learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

Our Design & Technology work is celebrated and assessed for impact through:

- Annual reporting to parents
- Use of the school assessment tracker
- Shared discussion with staff after ‘Project Days’
- Whole school displays
- Examples of the D&T process on social media and the school website
- Pupil questionnaires