Bricknell Primary School

Design Technology Curriculum Overview

THE CONSTELLATION TRUST

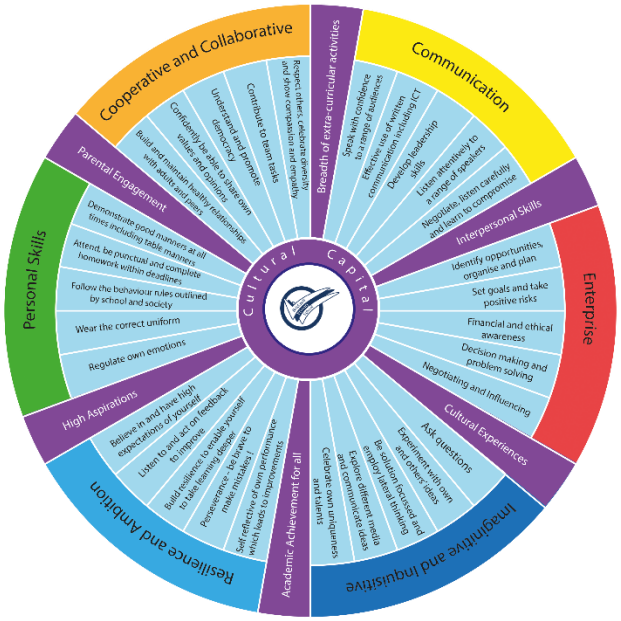
Contents

The Curriculum – our approach

Bricknell Primary School's curriculum has been developed over a period of 36 months. Much thought has gone into the research foundations for how children learn, the implication of subject specific best practice and the context of our school.

Through collaboration, rigours attention to detail and consultation with primary practitioners, trust leaders, secondary and Early Years teachers; the curriculum reflects a scheme of work that is intended to be sequenced form Early Years to Year 6 and enable pupils to be ready for the Key Stage 3 curriculum and world beyond education.

The curriculum design has a progressive approach at its core with a built in Aspiration Curriculum at the heart.



Intent:

The curriculum is built on the foundations of success. We believe all children should be aspirational, knowledgeable and should achieve their goals. This is the model our curriculum builds from

Aspiration

- An Aspiration Curriculum at the heart of every lesson.
- Building life skills to succeed outside the world of education.
- Real life examples and experiences in local contexts and in the wider world.
- Working with local colleges and building links.
- Community outreach opportunities.

Knowledge

- High quality teaching at the heart.
- Progressive curriculum mapping.
- Carefully timetabled broad and balanced curriculum.
- Carefully researched and implemented curriculum.
- Subject specific pedagogy.

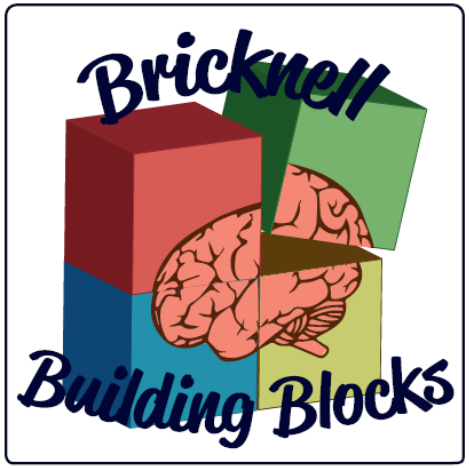
Achievement

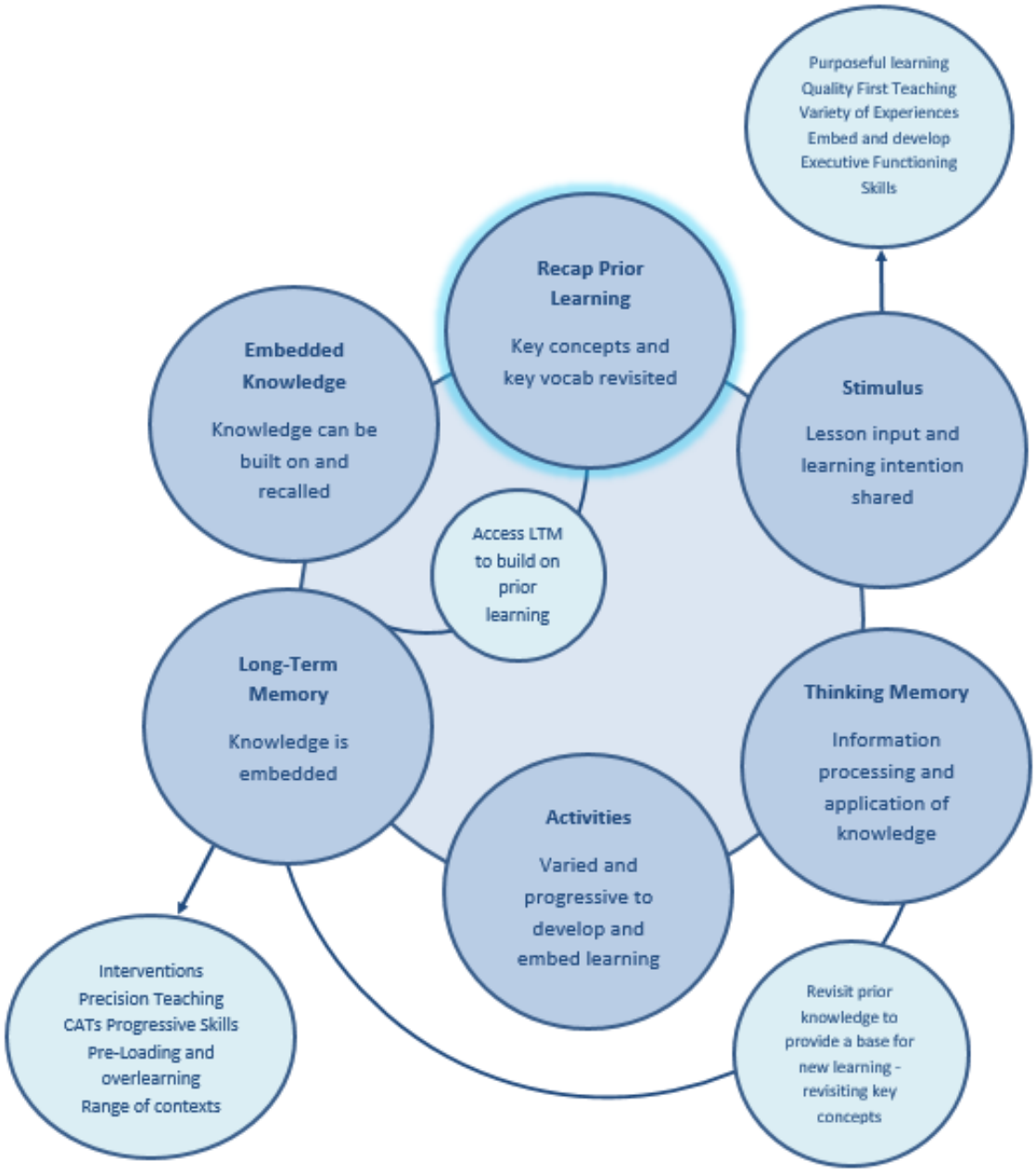
- Ambitious curriculum outcomes.
- Assessability for all.
- Identification and facilitation of pupil's passions and love for a subject.
- Achievement beyond the classroom and into further education demonstrating a love for learning.
- Extensive extra-curricular offer.

Bricknell's Working Memory Model

With the collation of all this extensive research, we have generated a 'Working Memory Model' which enables teachers to ensure that learning is robust and that all pupils are using their interconnected schema to their full potential.

At the core of our model is the retrieval of prior knowledge. Therefore, all lessons at Bricknell Primary School start with Bricknell's Building Blocks; the foundations to learning.





A Broad and Balanced Curriculum

Hours per day	4.25
Hours per week	21.25
Hours per year	828.75

Curriculum area	Hours per year	Total hours
English		
Reading	**78**	195
Writing	**117**	
Maths		
Maths	**195**	195
Computer Science		
Science	**78**	117
Computing	39	
Humanities		
RE	**39**	75
History	18	
Geography	18	
Creative		
Art	18	54
Design Technology	18	
Music	18	
Additional		
Physical Education	**78**	156
PSHE	**39**	
MFL	**39**	

Additional timetabled hours		
Enterprise Week	10	20
Transition Week	10	

At Bricknell, we want to ensure that we celebrate the talents of all pupils and provide everyone with opportunities to shine. Therefore, we have calculated the number of teaching hours available and have ensured that all pupils receive a broad and balanced curriculum at Key Stage 2.

To prepare our pupils for the digital world beyond the classroom and to enable their communication skills, upskilling them across all areas of the curriculum, we have allocated 39 hours a year to the computing curriculum. This can be cross curricular across all subjects and does not need to be taught each week.

Reading, Writing and Maths are taught daily.

Science Physical Education, PSHE, RE and MFL are required to be taught weekly.

These are highlighted in blue

History, Geography, Art, Design Technology and Music all have equal weighting with 18 hours a year broken down to 3 half-termly blocks.

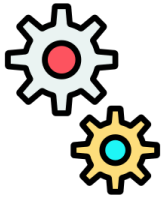
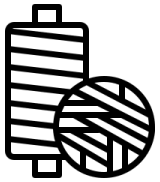
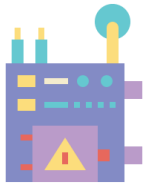
Year 4 offer a wider opportunities musical programme to the children therefore music has an increased weighting of 39 hours and to compensate, computing has a reduced weighting of 18 hours

- Art and Design Technology will each have 3 half term blocks. These will be taught alternatively to support staff workload.
- Music will have 3 half-termly blocks which will be taught at the same time across the whole school.
- Computing, History and Geography can remain blocked (in line with MTP)
- In addition to the teaching hours, pupils at Bricknell Primary School also receive a minimum of 400 minutes (6 hours, 40 minutes) of Opal Play a week.

Key Concepts

Through collaboration with subject leaders and subject specialists across our secondary schools, each subject has identified key concepts (big ideas) for their subject. These key concepts are the skills and knowledge essential to pupils achieving and exceeding expected standards in that specific subject. Key concepts are subject specific and build progressively as pupils move through the school. When pupils encounter a key concept, they will revisit other topics where they learnt about the same concept to enable them to make connections between different learning and build the schema they need.

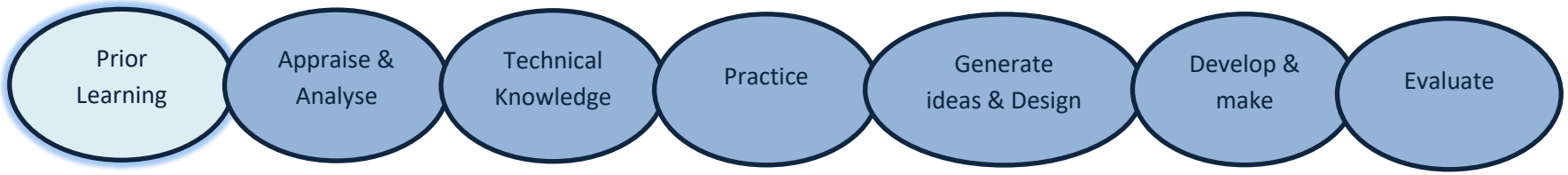
Below is a summary of the key concepts for Design Technology.

Design Technology				
				
Mechanics	Textiles	Structures	Electric and digital	Cooking and nutrition

Key concepts (Big Ideas) in **Design and Technology**

Pupils will become increasingly competent in designing, making and evaluating products. They will investigate how design has been used to solve problems and create products and structures in the real world, including the techniques used by designers to improve looks and functionality. They will have the opportunity to design their own products in response to design briefs, learn and experiment with a range of techniques before making and evaluating products.

Each unit of work will be based on the following teaching sequence.



The technical knowledge will be specific to the key concepts outlined below

Mechanics

Pupils will gain an understanding of how different mechanisms work, evaluate products with different mechanisms and design and make working products to fit a design brief. They will gain the technical knowledge needed to make different mechanisms work effectively.

Textiles

Pupils will gain the technical knowledge needed to work with textiles such as stitching, sewing and threading. They will study textile designs and how to make products which are practical as well as stylish and then apply this learning to their own designs and products.

Structures

Pupils will learn the technical knowledge used by designers to make structures which are strong and stable. They will learn and apply strengthening techniques, explore the benefits of different shapes and materials and apply this to their own designs and products.

Electric and digital

Pupils will learn how electronics and digital technologies are used when designing and creating products. They will gain the technical knowledge needed to programme devises and to make use of electric circuits including switches to power and control a product.

Cooking and nutrition

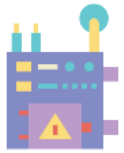
Pupils will learn where food comes from and how nutritional information can be used to plan a balanced and healthy diet. They will also learn techniques needed to prepare and cook food safely and design dishes and meals for specific purposes.

Design Technology Key Concepts Year Group Mapping			
	Autumn	**Spring**	**Summer**
EYFS **Expressive Arts and Design** **Physical Development**	In EYFS pupils are taught Design Technology through the strands **Expressive Arts and Design and Physical Development** Throughout the year pupils will be taught: **Structures, Textiles, Mechanics and Cooking and Nutrition**		
Year 1	**Cooking and Nutrition** (Smoothies)	**Textiles** (Puppet)	**Mechanics** (Moving story book)
Year 2	**Structures** (Houses of Parliament)	**Textiles** (Easter basket)	**Cooking and Nutrition** (Wrap pizzas)
Year 3	**Structures** (Big Wheel)	**Textiles** (Mother's Day cushion)	**Cooking and Nutrition** (Vegetable parcels)
Year 4	**Digital & electrical** Electrical Systems (Torches)	**Digital & electrical** Digital World (Monitoring device)	**Mechanics** (Slingshot car)
Year 5	**Cooking and Nutrition** (3 Course Meal)	**Textiles** (Book Sleeve)	**Structures** (Bridges)
Year 6	**Digital & electrical** Digital World (Navigating the world)	**Digital & electrical** Electrical Systems (Steady hand game)	**Mechanics** (Automata toys)

Knowledge and skills sequencing	DESIGN AND TECHNOLOGY						
	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Mechanics  Appraise and analyse Technical knowledge Practice Generate ideas and design Design and make Evaluate	***Nursery:*** *To explore different toys that move and make them work by pressing parts or appying force.* *To know that a push or pull can move an object or stop it from moving.* *To look at books with moving parts and use the levers and sliders appropriately.* ***Reception:*** *To use magnets to move things.* *To use split pins to make body parts move.*	To appraise and analyse mechanisms in existing products (moving story book and match box cars) To identify how mechanisms work in existing products e.g. sliders/levers and wheels/axels To be able to make prototype mechanisms To design using pictures and labels To create a product which includes sliders and levers / wheels and axels To evaluate my product against function			To analyse slingshot and identify how they work To identify how a chassis and launch mechanism works To produce a mechanical prototype – slingshot To design a car with a slingshot mechanism To select appropriate materials to produce a mechanical product – slingshot car To evaluate my product and identify ways to improve my design		To appraise and analyse a range of existing products – automata toys To gain an understanding of how cams and followers work To use a range of materials, tools and techniques to create a prototype – cams and followers To design a product that meets the design brief – automata toys To use a range of materials, tools and techniques to make a product To evaluate an end product against a design criteria and consider the views of others to improve their work

	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Textiles  Appraise and analyse Technical knowledge Practice Generate ideas and design Design and make Evaluate	***Nursery:*** *To know that things feel different.* *To explore different textiles and talk about how they feel to touch.* *To sort different materials.* ***Reception:*** *To investigate the properties of textiles.* *To recreate a pattern using thread and weaving techniques.* *To cut and join fabrics with simple techniques.* *To use my fine motor skills to thread different items.*	To appraise and analyse a selection of puppets To identify techniques used to create a puppet (stapling, gluing etc) To practise a range techniques used to make a puppet to create a prototype (stapling, gluing etc) To design a product using pictures and words To use a range of tools and materials to create a finished product To evaluate an end product in terms of aesthetics – puppet	To appraise and analyse a selection of easter baskets To identify techniques used to create a basket (sewing, threading etc) To practise a range of techniques used to used to make a basket (sewing, threading etc) PR To design a product using pictures and words based on a design criteria To use a range technical knowledge and skills to create a finished product To evaluate my basket in terms of design	To research a design concepts or range of products and appraise them To understand how a cross stitch design is created To practise skills identified to develop a design of my own To be able to generate and develop ideas using exploding diagrams to design an end product To be able to think ahead about the order of my work, select tools needed for a given task and give reasons for my choices To be able to evaluate a finished product against a design brief		To appraise and analyse an existing product commenting on design features To understand how pattern pieces are used to make an end product To experiment with pattern pieces to create a prototype To design a product using pattern pieces to meet a design brief To use pattern pieces, appropriate materials and tools to create an end product To evaluate a product on appearance and function against an original design criteria and justify decisions made in the design and making process	

	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Structures  Appraise and analyse Technical knowledge Practice Generate ideas and design Design and make Evaluate	***Nursery:*** *To take apart and talk about (with support) how cardboard boxes used in everyday life.* *To use various construction materials, stacking vertically and horizontally, balancing, making enclosures and creating spaces.* *To use a glue spatula.* *To use a masking tape to join.* *To use simple mark making techniques to represent/ communicate my ideas.* *To develop my own ideas through experimentation with a range of materials.* *To safely use tools and materials.* ***Reception:*** *To take apart and talk about how cardboard boxes used in everyday life to see how they are made and put them back together again.* *To use string, sellotape, glue, masking tape and PVA glue to join materials.* *To choose materials which are suitable for my design and explain my reasoning.* *To use small school scissors safely and effectively.* *To talk about what I intend to make and represent my ideas using pictures.* *To know how to use objects and join and manipulate them to make a prop to support play.* *I know how to use and talk about different materials to achieve a desired effect or outcome.*		To appraise and analyse how a structure is made To identify how a net is created using shapes To practise making stable structures using nets to make a building (houses of parliament) To design a structure (building) using pictures and words based on a design criteria To make and join together a stable structure (building) using nets To evaluate my structure in terms of design	To research fairground structures (ferris wheels) and consider how these structures work To identify the structure of a big wheel and analyse the support techniques to make the structure strong To explore suitable materials to create a strong structure (wheel) To generate ideas and design a structure including strengthening techniques (ferris wheel) To use appropriate tools and construction materials to make a structure (ferris wheel) To evaluate my structure and suggest ways for improvement		To analyse structural designs in terms of functionality, aesthetics and materials To understand different methods of strengthening bridges To practise a range of structural designs to create bridges To generate ideas and design a structure (bridge) demonstrating my design from different perspectives To use a range of appropriate tools competently and To join and combine a range of materials competently To evaluate a product on appearance and function against an original design criteria and justify decisions made in the design and making process	

	EYFS	KS1	Year 4		Year 6	
Electric and digital  Appraise and analyse Technical knowledge Practice Generate ideas and design Design and make Evaluate			**Digital** To explain what a monitoring device is and how they are used in every day life To learn how to use Makecode to program a monitoring device To learn how to use TinkerCAD to make a prototype for a housing unit To design a monitoring device and housing unit for an animal enclosure To use Microbit and TinkerCAD to program a monitoring device and design a housing unit To evaluate virtual model against the design requirements	**Electrical** To appraise and analyse a range of torches and comment on their features To learn about electrical items and how they work To learn how a switch controls the flow of an electric current To design a torch based on a user profile To make a torch based on a user profile To evaluate my torch and identify any improvements that could be made.	**Digital** To appraise and analyse a selection of navigational tools and consider and suggest additional functions for them To know how to use Makecode to program a navigational tool To know how to use TinkerCAD to make a prototype for a sustainable case To create a sustainable design of a navigational device and case considering material decisions To use Microbit and TinkerCAD to create an advanced program for a navigational tool and design a sustainable case To evaluate virtual model against own design criteria and consider the views of others to improve their work	**Electrical** To appraise and analyse a range of toys and identify if the form follows its function To create a range of electrical circuits and identify their components To practise using a range of tools and techniques to create part of a product To generate ideas and design a product that meets the design brief To use a range of tools and techniques to make a product To evaluate their ideas and products against their own design criteria and consider the views of others to improve their work

	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Cooking and nutrition  Appraise and analyse Technical knowledge Practice Generate ideas and design Design and make Evaluate	***Nursery:*** *To name a range of different fruit and vegetables.* *To sort healthy and unhealthy foods.* *To taste a variety of foods from different cultures.* ***Reception:*** *To sort healthy and unhealthy foods and design a healthy plate.* *To create a fruit kebab.* *To taste a variety of foods from different cultures and talk about the flavours.* *To understand the need for variety in food and maintain a healthy lifestyle.* *To notice and talk about changes when ingredients are combined or exposed to hot and cold temperatures.*	To identify where our fruit and vegetables come from to make a healthy product (smoothie) To identify different techniques used to prepare and create a healthy product (mushing, chopping, blending) To practise a range of different techniques to prepare and create a healthy product (mushing, chopping, blending) To design a product using pictures and words To use a range of technical knowledge and skills to create a finished product (mushing, chopping, blending) To evaluate their healthy product in terms of design and the taste	To identify ingredients from different food groups to create a healthy and balanced product (wrap pizza) To identify different techniques to prepare a healthy and balanced product (peeling, chopping, grating, spreading, cooking) To practise a range of techniques to prepare a balanced product (peeling, chopping, grating, spreading, cooking) To design a healthy, balanced product using simple drawings and labels (food groups) To use a range of technical knowledge to create a finished product (peeling, chopping, grating, spreading, cooking) To evaluate their product against their original design and a design criteria	To identify seasonal ingredients used in an existing product To identify techniques used and to write a method to create an existing product. To practise a range of different techniques to prepare and create a seasonal product (grating, chopping, slicing, rolling, folding, pinching, egg washing) To design a seasonal dish using exploded diagrams. To use a wider range of technical skills and tools to create a finished product To evaluate their finished product against their original design and a design criteria		To appraise and analyse a range of predominantly savoury dishes within a three course meal To identify how the different cooking techniques can be used to create a range of healthy and balanced dishes. To practise a range of different cooking techniques to decide which is the most appropriate method . To work collaboratively to design a three course menu. To use a range of tools and cooking methods to prepare and make a three course meal. To evaluate their finished product against their original design, a design criteria and consider the views of others.	

Second Order Concepts

Second order concepts are fundamental knowledge and skills which are transferable across a range of curriculum subjects. For example, we introduce pupils to the concept of 'similarity and difference' early in their education, developing the observational skills and language needed to make comparisons. This is developed and applied as pupils move through the school so they can confidently apply this in all areas of the curriculum by upper Key Stage Two.

A summary of the second order concepts and how they apply to Design Technology are provided in the table below.

Curriculum subject	Significance	Similarity and difference	Cause and consequence	Continuity and change	Responsibility	Communication (Oracy & Written)	Enquiry
D&T	Significant designers and designs, real world examples of effective and successful products and designs	Making comparisons between products and designs to inform own plans, noting differences, drawing conclusions	Identifying how things work, how an action can cause change or movement/ strengthen	How design has changed over time	Working safely with different materials, responsibilities to customers to ensure quality products, healthy eating	Using correct terminology, evaluating, communicating designs accurately, labelling and annotating, explaining processes, presenting	