



## DESIGN AND TECHNOLOGY INTENT - to what do we aspire for our children?

'Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils 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.'

Source: National Curriculum, 2013

School's key drivers and how the subject develops them:

- **Be Proud**
  - Children are proud of their designs and products
  - Articulate their learning journey alongside their successes
  - To nurture creativity in the design process and develop a personal style
  
- **Be Kind**
  - Make informed and respectful evaluations of their own and others' products in order to change and advance their design
  - Use empathy to design a brief for others; understanding that design can be life changing
  
- **Strive for Success**
  - Develop resilience through reviewing and adapting their designs and products
  - Value nutritional knowledge and cooking knowledge as essential life skills
  - Inspire pupils to be innovative and creative thinkers who develop an appreciation of the product design cycle through ideation, creation and evaluation
  - Learn about the designed and made world and how things work; learn to design and make functional products for particular purposes and users.
  - Pupils take risks and develop confidence through drafting design concepts, modelling, testing and to be reflective learners who respectfully evaluate their work and the work of others
  - Participate in focused practical tasks in which children develop particular aspects of knowledge and skills

### Aims:

The national curriculum for design and technology aims to ensure that all pupils:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook
- articulate their understanding of themselves as designers and their process of designing
- broaden experiences that help them understand how design impacts on their lives today: locally and nationally



**Long term sequence (Including EYFS to KS1 progression)**

**Early Years:**

Expressive Arts and Design

Expressive Arts and Design involves the development of the children’s artistic and cultural awareness and supports their imagination and creativity. The frequency and range of opportunities is important to enable them to explore and play using a wide range of media and materials.

The quality and variety of what the children see, hear and participate in is crucial for their understanding, self-expression, vocabulary and ability to communicate through the arts.

Design and Technology is covered in Expressive Arts and Design	Nursery – how is this achieved?	Reception – how is this achieved?	Key vocabulary	Core Books that link to foundational experiences & knowledge
<p><b>Expressive Arts and Design</b></p> <p><u>Creating with Materials</u></p> <ul style="list-style-type: none"> <li>• Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</li> <li>• Share their creations, explaining the process they have used.</li> <li>• Make use of props and materials when role -playing characters in narratives and stories.</li> </ul>	<p>Children use a variety of tools and materials with guidance following their interests.</p> <p>Children celebrate their creations with their peer group using learnt vocabulary.</p> <p>Children use props in their role -play that they have designed, to enable them to be involved in narratives and known stories.</p>	<p>In addition....</p> <p>Children confidently use different materials and tools, learning how to use them appropriately to create their designs drawing on their own experiences. They use different mediums with confidence.</p> <p>Model ideas by exploring materials, components and construction kits.</p> <p>Children celebrate their designs by explaining what they have achieved to their peers and adults using appropriate vocabulary.</p> <p>Children select the materials and design props for role- playing characters in narratives and stories during their learning. They are able to explain what they have designed and how they use it.</p>	<p>Plan Design Make Review Change Improve Cut Stick Attach Build Draw</p>	<p>The House that Jack Built Dig Dig Dig The Street Beneath my Feet Rosie Revere Engineer The Dot The magic Paintbrush What We’ll Build</p>

**Continuous Provision Play experiences with provocations for Design and Technology based thinking and talk**

- Role play – home corner
- Construction equipment
- Book corner, creative area
- Art and design display area
- Dressing up clothes/props
- Household objects
- Outside, role play and building



D&T Topics 2022-23

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 1	Mechanisms Making a moving story book	Structures Constructing a windmill	Textiles Puppets	Mechanisms Wheels and Axles	Food Fruits and vegetables	Overflow time to complete units or extend units.
Year 2	Mechanisms Making a moving monster	Structures Baby bear's chair	Mechanisms Fairground wheel	Textiles Pouches	Food A balanced diet	Overflow time to complete units or extend units.
Year 3	Textiles Cushions	Electrical systems Electric poster	Mechanical systems Pneumatic toy	Digital world Electronic charm	Food Eating seasonally	Structures Constructing a castle
Year 4	Electrical systems Torches	Mechanical systems Making a slingshot car	Digital world Mindful moments timer	Food Adapting a recipe	Structures Pavilions	Textiles Fastenings
Year 5	Mechanical systems Making a pop-up book	Electrical systems Doodlers	Food What could be healthier?	Structures Bridges	Digital world Monitoring devices	Textiles Designing a stuffed toy
Year 6	Digital world Navigating the world	Structures Playgrounds	Mechanical systems Automatic toys	Textiles Waistcoats	Electrical systems Steady hand game	Food Come dine with me

There are **4 core strands** that run through each unit with cooking and nutrition as a focus once a year. This gives children an opportunity to revisit and deepen their understanding of these across the curriculum.

- Design
- Make
- Evaluate
- Technological Knowledge

Sequence of [vocabulary progression](#)



An example of the progression in the core strand of 'design' can be found below:

Kapow Primary Strands:		Key stage 1		Key stage 2			
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design	Structures	<ul style="list-style-type: none"> <li>Learning the importance of a clear design criteria</li> <li>Including individual preferences and requirements in a design</li> </ul>	<ul style="list-style-type: none"> <li>Generating and communicating ideas using sketching and modelling</li> <li>Learning about different types of structures, found in the natural world and in everyday objects</li> </ul>	<ul style="list-style-type: none"> <li>Designing a castle with key features to appeal to a specific person/purpose</li> <li>Drawing and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials need and colours</li> <li>Designing and/or decorating a castle tower on CAD software</li> </ul>	<ul style="list-style-type: none"> <li>Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect</li> <li>Building frame structures designed to support weight</li> </ul>	<ul style="list-style-type: none"> <li>Designing a stable structure that is able to support weight</li> <li>Creating frame structure with focus on triangulation</li> </ul>	<ul style="list-style-type: none"> <li>Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs</li> </ul>
		Make	Mechanisms/ Mechanical systems	<ul style="list-style-type: none"> <li>Explaining how to adapt mechanisms, using bridges or guides to control the movement</li> <li>Designing a moving story book for a given audience</li> <li>Designing a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move</li> <li>Creating clearly labelled drawings which illustrate movement</li> </ul>	<ul style="list-style-type: none"> <li>Creating a class design criteria for a moving monster</li> <li>Designing a moving monster for a specific audience in accordance with a design criteria</li> <li>Selecting a suitable linkage system to produce the desired motions</li> <li>Designing a wheel Selecting appropriate materials based on their properties</li> </ul>	<ul style="list-style-type: none"> <li>Designing a toy which uses a pneumatic system</li> <li>Developing design criteria from a design brief</li> <li>Generating ideas using thumbnail sketches and exploded diagrams</li> <li>Learning that different types of drawings are used in design to explain ideas clearly</li> </ul>	<ul style="list-style-type: none"> <li>Designing a shape that reduces air resistance</li> <li>Drawing a net to create a structure from</li> <li>Choosing shapes that increase or decrease speed as a result of air resistance</li> <li>Personalising a design</li> </ul>
Evaluation							
Technical knowledge							

Below is an example of the overview of the **skills** and **knowledge** covered in each year group and strand and how these are developed through our Design and Technology scheme of work.

		Progression of skills and knowledge		Structures
		Year 1	Year 2	
Skills	Design	<ul style="list-style-type: none"> <li>Learning the importance of a clear design criteria</li> <li>Including individual preferences and requirements in a design</li> </ul>	<ul style="list-style-type: none"> <li>Generating and communicating ideas using sketching and modelling</li> <li>Learning about different types of structures, found in the natural world and in everyday objects</li> </ul>	
	Make	<ul style="list-style-type: none"> <li>Making stable structures from card, tape and glue</li> <li>Learning how to turn 2D nets into 3D structures</li> <li>Following instructions to cut and assemble the supporting structure of a windmill</li> <li>Making functioning turbines and axles which are assembled into a main supporting structure</li> </ul>	<ul style="list-style-type: none"> <li>Making a structure according to design criteria</li> <li>Creating joints and structures from paper/card and tape</li> <li>Building a strong and stiff structure by folding paper</li> </ul>	
	Evaluate	N/A	<ul style="list-style-type: none"> <li>Exploring the features of structures</li> <li>Comparing the stability of different shapes</li> <li>Testing the strength of own structures</li> <li>Identifying the weakest part of a structure</li> <li>Evaluating the strength, stiffness and stability of own structure</li> </ul>	
Knowledge	Technical	<ul style="list-style-type: none"> <li>To understand that the shape of materials can be changed to improve the strength and stiffness of structures</li> <li>To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses)</li> <li>To understand that axles are used in structures and mechanisms to make parts turn in a circle</li> <li>To begin to understand that different structures are used for different purposes</li> <li>To know that a structure is something that has been made and put together</li> </ul>	<ul style="list-style-type: none"> <li>To know that shapes and structures with wide, flat bases or legs are the most stable</li> <li>To understand that the shape of a structure affects its strength</li> <li>To know that materials can be manipulated to improve strength and stiffness</li> <li>To know that a structure is something which has been formed or made from parts</li> <li>To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move</li> <li>To know that a 'strong' structure is one which does not break easily</li> <li>To know that a 'stiff' structure or material is one which does not bend easily</li> </ul>	
	Additional	<ul style="list-style-type: none"> <li>To know that a client is the person I am designing for</li> <li>To know that design criteria is a list of points to ensure the product meets the clients needs and wants</li> <li>To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity</li> <li>To know that windmill turbines use wind to turn and make the machines inside work</li> <li>To know that a windmill is a structure with sails that are moved by the wind</li> <li>To know the three main parts of a windmill are the turbine, axle and structure</li> </ul>	<ul style="list-style-type: none"> <li>To know that natural structures are those found in nature</li> <li>To know that man-made structures are those made by people</li> </ul>	



Knowledge organisers are used to detail the core knowledge and vocabulary for each unit. These are used to reduce the split attention effect for learners.

An example of a KS1 [Knowledge Organiser](#)

An example of a KS2 [Knowledge Organiser](#)

### 'Golden Thread': Oracy

At Stoke Park Primary, we recognise the vital role that oracy plays in the lives of our children, both during their time in primary school and for the rest of their lives. Research shows that oracy not only acts as a powerful tool for learning but is a key skill in itself which employers actively seek. By ensuring that children have explicit opportunities to develop their oracy skills as well as opportunities to learn through oracy across the curriculum, we aspire to create young adults who are able to work confidently, articulately and collaboratively.

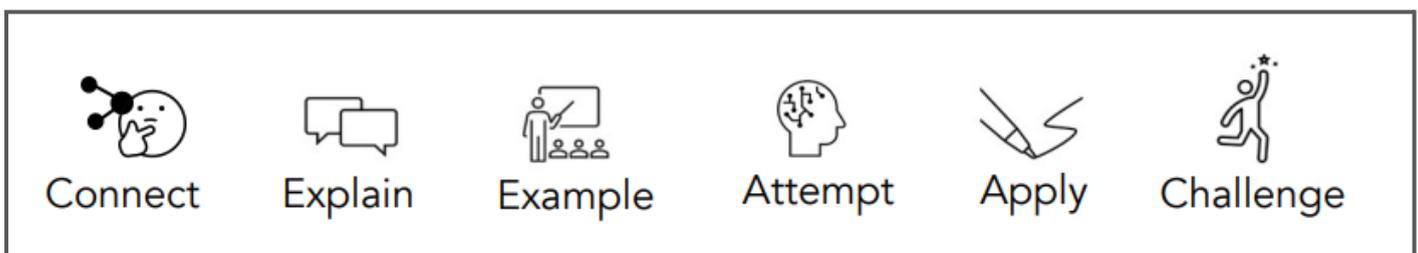
We promote oracy through Design and Technology by teaching vocabulary and oracy structures that allows the children to design, make, evaluate and share their ideas.

### IMPLEMENTATION - how will we deliver the curriculum?

Design and Technology is taught termly in a 1.5 day block in KS1 and KS2.

This ensures that the core strands are revisited regularly giving an opportunity to deepen their understanding and knowledge.

### Lesson design



Each lesson follows the model above.

- CONNECT to prior knowledge
- EXPLAIN new content
- give an EXAMPLE of new learning
- Pupils ATTEMPT new learning with scaffolding
- APPLY new learning independently
- Pupils are CHALLENGED to integrate learning with prior knowledge

In every lesson you would expect to see (bold for every lesson):

- **Explicit teaching of and recapping of vocabulary**
- **Explicit reference to the core 4 strands**
- Stimulus or evaluating existing products
- **Children using individual sketchbooks to chart the design cycle**
- **Reasonable adjustments made to ensure that all children can make progress**



- Focussed practical task with modelling
- **Opportunities for discussion and purposeful talk**
- **Excellence in effort; technique and outcome highlighted and celebrated**
- **Respectful and knowledgeable use of materials**
- When appropriate, a 'Gallery Walk'

### SEND

We recognise some pupils need provision 'additional to' quality first teaching in order to reach their potential as designers. This includes:

- Carefully considered scaffolding
- Pre and post-teaching
- Pre-planned management of cognitive load
- Explicit instruction and modelling
- Alternative ways of recording
- Additional targeted adult support

In some instances, specialist adaptations are made to support the specific barriers of individual pupils.

### Curriculum enrichment

We use the local environment as well as organised trips within the Bristol area

- The Clifton Suspension Bridge
- SS Great Britain
- British Aerospace Museum
- Pizza workshops
- Draw on parental expertise such as engineering, architecture, chefs, etc
- Explore diverse and world wide designers, from different cultures and social backgrounds.

## IMPACT - how do we know our curriculum is effective?

### Assessment

Our curriculum is designed and built on the premise that 'learning equals a persistent change in the long term memory.' Therefore, the assessment structures are designed to evaluate the effectiveness of the curriculum after some time has elapsed.

### Summative Assessment

The curriculum is a progression model. Teachers will know whether students are making progress if they are learning more of the curriculum.

Our curriculum is designed to ensure sequencing of core knowledge, vocabulary, the 4 strands and skills. They will know more, and remember more with the taught curriculum content. Essentially they will be able to do more with this knowledge in carefully designed learning tasks.

This will be assessed using the Book Study approach- talking with pupils and looking at their books systematically to reveal:

- Content and knowledge
- Vocabulary
- How the pedagogy and taught curriculum helps/hinders their learning

### Formative Assessment



Pupils will be assessed formatively as each lesson progresses. Pupils will be given tasks from which the teachers will draw conclusions. Adaptations will then be made as a result of that evidence.

Strategies that might be used are:

- Making explicit the learning intention and success criteria
- Eliciting evidence of pupils' prior knowledge
- Feeding back at the point of learning
- Inclusive questioning i.e. cold call, mini whiteboards

#### **Pupil Voice**

- demonstrate a passion and enthusiasm for D&T
- use vocabulary correctly
- talk about the 4 core strands
- talk about the 'why' behind the work
- explain how learning builds on previous knowledge
- critically evaluate their and others' products respectfully

#### **High quality outcomes:**

- demonstrates pride and effort
- captures increasing understanding of the 4 core strands and knowledge
- demonstrates a clear sequence of learning
- vocabulary clearly visible
- all children make progress regardless of starting points