

Askwith Primary School

Design and Technology rationale

Our curriculum offer for design and technology begins in Early Years. 'Children develop quickly in the early years and a child's experiences between birth and age five have a major impact on their future life chances.'

EYFS Statutory Framework, 2021

Our planning, teaching and assessment of the curriculum is informed by the nine principles of cognitive science (Daniel Willingham). This includes the 'must haves' or the end states in the child's mind and the 'could dos' or the teacher behaviours that alter the states in the child's mind. In design and technology, we recognise the 'must haves' as the alteration to long-term memory that allows children to retrieve substantive and disciplinary knowledge fluently, and to have a positive self-image as a learner. We recognise the 'could dos' as sequenced lessons in design and technology of the essential knowledge, the explicit teaching of vocabulary and abstract concepts, retrieval practice for knowledge and interleaving.

The fundamental role of design and technology at Askwith Primary School lies in allowing children the opportunities to apply their creativity and their imagination to create products to solve real and relevant problems. Design and technology allows all children (this includes SEND, EAL, PP and vulnerable children) opportunities to create products for their own needs and wants along with the needs, wants and values of others, including British Values and natural links to our global themes. Purposeful and natural links to **Fundamental British Values, SMSC and global themes** are an integral part of our curriculum and are threaded through the design and technology curriculum.

At Askwith Primary School, we believe that all children's education begins in Early Years. Our curriculum is aligned to the Early Years Framework and shows the sequential steps of essential knowledge acquired from Reception to Year 6.

Design and technology is an evaluative subject and children are given the chance to draw on the disciplines of other subjects, including mathematics and science.

"High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation."

National curriculum, 2014

Intent	Implementation
All knowledge is embedded from 2021-2022	<ul style="list-style-type: none">All knowledge checks for all pupils include connected knowledge from the previous units of learning in order to ensure there are no gaps or forgotten knowledgeAll gaps or forgotten knowledge to be addressed prior to teaching new knowledge

The design and technology curriculum starts in Early Years

Monitoring and evaluation continues to be robust and roles of TAs developed in this process

The planning, teaching and assessment of the design and technology curriculum is informed by the nine principles of cognitive science (Daniel Willingham)

All staff have an up-to-date knowledge of dialogic/cognitive science principles throughout the school

- Planning demonstrates the sequential steps of essential knowledge acquired from Reception to Year 6
- The design and technology curriculum is aligned to Expressive Arts and Design in the Early Years framework
- Book scrutiny
- Drop-ins planned
- Knowledge checks carried out by all TAs to ensure subject knowledge is secure
- Planning and learning journeys consider the essential knowledge and how to guide the pupil's thinking
- Planning demonstrates an obvious progression of skills and knowledge throughout the school
- Working memory capacity is considered when planning and teaching
- Blocking allows pupils sufficient time to become fluent in their knowledge
- Curriculum meets the needs of all pupils; pupils are provided with the appropriate level of challenge
- Pupils have the opportunity to deliberately practise newly acquired knowledge
- Mini knowledge checks and full knowledge checks will ensure that this knowledge is embedded in their LTM and that all pupils meet their endpoints
- Pupils articulate how they know more, remember more and therefore do more
- Instil growth mindset ethos which talks about successes and failures in terms of effort rather than ability (4Rs)
- Training programme for all staff
- Series of lesson studies for TAs

Design and technology is taught throughout the school through deliberate practice in a supportive environment which enables children to improve their fluency leading to mastery and an alteration to their long term memory.

Technical vocabulary
(including tiered vocabulary)

Writing is valued/prioritised in design and technology (Quality of Education 2, 3, 4)

Oracy is taught deliberately, explicitly and systematically across the school and throughout the design and technology (Quality of Education 5)

Further develop pupils' understanding of how feedback contributes to knowledge build up and positive attitudes to learning (Behaviour and attitudes 2)

There is a balance of written/practical knowledge checks in DT (Quality of Education 11)

- Blocking allows children sufficient time to become fluent in their knowledge of design and technology and checks will ensure this is embedded in their long term memory
- Planning demonstrates a substantive and disciplinary approach to teaching design and technology lessons, allowing children the appropriate opportunities to apply knowledge in an increasingly creative way

- The acquisition of vocabulary is planned into each unit

- Transcription opportunities are planned into each unit
- Expectations of composition are the same across all curriculum areas (writing checklists)

- Family group focus - children to discuss learning in design and technology

- Work scrutiny focuses on examples of high quality feedback
- Pupil discussions re: how is the feedback helping them?
- Pupils present the impact of feedback to Parents/LGB
- CEO/governors question pupils on the impact of feedback

- Drop-ins to practical lessons of DT
- Analyse knowledge checks to monitor retention of application and practical skills in DT
- Feedback to governors on balance of written

<p>The design and technology curriculum allows children the opportunities to develop and apply language knowledge and mathematics. It will enrich their understanding of all subjects.</p> <p>Reading is prioritised in design and technology.</p> <p>Enhancements and leaderships opportunities reflect need in 2022-23</p> <p>Design and technology rationale is updated where relevant</p>	<ul style="list-style-type: none"> • knowledge and practical skills • Provide a balanced curriculum that is sequenced appropriately with natural links to other curriculum areas. • Teachers will plan lessons to deepen children's knowledge and allow them to fully investigate places and their features before moving them on to new content. • Children will be taught how to formulate questions, to investigate similarities and differences that exist. They will be encouraged to discuss these with interest and sensitivity • Opportunities are given across all year groups for reading (see table below). When appropriate this is personalised to meet reading need, in particular in Key Stage One and Early Years • Increase leadership opportunities in Design and technology across the school for all pupils (Personal Development 3) • Rolling programme of design and technology visits and visitors <p>Evidence informed practice continues to inform effectiveness of the design and technology rationale and curriculum</p>
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SMSC in design and technology

Spiritual education in design and technology is the process of creative thinking and innovation inspires children to bring out undiscovered talents, which in turn leads to self-confidence and belief in their abilities.

Moral education in design and technology develops a sense of 'moral conscience' in our children, through focusing upon the dilemmas raised in designing and making new products. We teach children to understand the wider impacts on the environment when designing and

making new products and to consider carefully the materials they will use when designing and making. We encourage sustainable thinking.

Social education is a key feature of the design and technology curriculum. Children learn why it is important to design and make products that are safe for the end user. There is an emphasis on developing the ability to work collaboratively and resolve any problems. All children have a voice and provide feedback to one another and children are taught to accept this feedback and respond accordingly.

Cultural education in design and technology builds children's knowledge of how products and inventions have been developed around the world.

Substantive and disciplinary knowledge in design and technology

Substantive knowledge in design and technology is based on the knowledge of four key elements of the process of design (design, make, evaluate and technical knowledge). Children are taught what they need to know, the declarative knowledge, and how to use what they know, the procedural knowledge. All of these elements will be taught from Reception to Year 6 and vocabulary is taught explicitly and will be deliberately practised and applied through the 4 key elements. These are:

Design	Know how to design a product that is purposeful, functional and appealing to a specific group.
Make	Know how to cut, join and finish a range of increasingly complex materials, ranging from paper to wood.
Evaluate	Know how to investigate, evaluate and analyse a range of existing products and their own designs based on a specific design criteria. In addition to this, children will know key individuals have helped to shape the world in which we live in.
Technical knowledge	Know how to apply their knowledge of specific materials to meet the criteria listed above in the design, make and evaluate stages.

Vocabulary in design and technology

Our dialogic approach is integral to our practice. All classrooms are language-rich and support children to develop their bank of vocabulary and language. All teachers know that there are different tiers of vocabulary and that vocabulary can be vertical and horizontal in meaning. Alongside our dialogic approach, each classroom consistently displays tier two vocabulary that comes from classroom dialogue on 'What Do Words Mean?' displays and each topic display board includes key words. This tends to be subject-specific, tier three vocabulary. The vocabulary for each unit of knowledge is identified and pre-planned including previously taught vocabulary and current vocabulary (see essential knowledge overviews).

This vocabulary is discussed as it arises within the context of the lesson in all years and the vocabulary is also taught/reinforced during weekly vocabulary sessions in years 1-6. All classrooms are literature-rich and high-quality topic books/texts are chosen to provide reading opportunities within each unit of knowledge.

Disciplinary knowledge in design and technology is the process of enabling children to use their substantive knowledge of products and materials around them to make links between and across different areas of the curriculum. Knowledge in design and technology will equip the children with the opportunity to explain how and why products have changed over time and how they might be further improved in the future. They can use their knowledge and understanding to suggest how existing products may be improved with the advances in modern technology. Children will demonstrate that they have the cultural capital to become global citizens, following global themes and fundamental British Values, in an ever changing and technologically advancing world.

Why this? Why now?

The rolling programme of units of knowledge allows for mixed year classes to acquire essential knowledge over two years (year A and year B).

- Cooking and nutrition (Year 1 and 2, Year A and B, Autumn)

During this unit of knowledge, the children learn about where vegetables (Year A) and fruits (Year B) come from and how to prepare and eat them. This unit will be revisited throughout Year 1 and 2 in science when the children learn about the different food groups and the importance of eating a balanced diet.

- Textiles (Year 3 and 4, Year A, Spring)

This unit of knowledge builds on the connected knowledge the children have of vegetables and fruits from key stage one. They will learn how different foods have natural dyes in them and how these can be transferred to fabrics. There is also connected knowledge with art and how to dye materials with a range of dyes.

- Structures with electrical systems (Year 3 and 4, Year A, Spring)

This unit of knowledge is in the spring term because prior to this the children will have learnt about electrical circuits in science so they will have connected knowledge of the construction of an electrical circuit before they apply that knowledge into a structure.

- Wooden structures with electrical components (Year 5 and 6, Year A, Summer)

During this unit of knowledge, the children will apply their connected knowledge of electrical circuits from science to incorporate an electrical element into their wooden structure. For the year 5 children, it will be applied from their learning in year 4 and for the year 6 children it will be applied from their science learning in year 5. This unit also provides children with the opportunity to build on their knowledge of structures from year 3 and 4

when they used paper and card and apply this learning to the construction of a wooden structure.

Creativity in design and technology

"Creativity is the act of turning new and imaginative ideas into reality, the tendency to generate or recognise ideas, alternatives or possibilities that may be useful in solving problems, communicating or in finding gratification or entertainment."

P. Woodward, TES 2016

"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."

National Curriculum, 2014

There are many opportunities for children to demonstrate their creativity in design and technology. This can be through the design phase, the making phase - where they make additions or alterations to their plan, or during the evaluation phase where they can think how the product may be further improved. It is a subject which has wide ranging opportunities for natural cross-curricular learning, whether that be through planning using exploded or cross-sectional diagrams, scientific investigation into the properties of different materials in a range of situations, the historical changes in technology and the advancements made by specific individuals or detailed mathematical measurements of lengths and angles.

British Values

Design and technology at Askwith Primary School develops children's understanding of Fundamental British Values and how to express themselves in a respectful way. From the substantive knowledge of how to follow rules when using tools, to staying safe, to providing children the opportunities to explore their own individual liberty through expressing themselves through the design process, children will see how British Values are interwoven through the whole design and technology curriculum.

Stretch and Challenge

Dame Alison Peacock tells us in her book *Assessment for Learning without Limits*, we can get it very wrong when "false, limiting assumptions are made about children's capacity to learn." There is no national definition of 'most able'. Abilities are not fixed and the situation is always fluid. In every primary classroom, there will always be a wide range of abilities that change over time. We believe, therefore, that when 'stretching and challenging' our pupils, it is vital to do so within an ethos of high expectation and knowing our pupils well. This enables our planning to be focused and therefore effective in meeting the needs of all pupils.

Reading opportunities in design and technology

Reading underpins our entire curriculum. Key texts and pieces of information are carefully selected ensuring that the content and reading age are appropriate. Key texts are on display and made available for the children to access during daily 'reading for pleasure' time. The table below demonstrates the range of reading opportunities in design and technology:

Class/year group	Area of essential knowledge	Examples of reading
4: Y5/6	<p>Construction: mechanisms - Cams</p> <p>Textiles: join and decorate fabric</p>	<ul style="list-style-type: none"> • Instructions • Adapted text A brief History of the snap Fastener • Adapted text: snap fasteners/press studs • Adapted text re: Karen Rose, Margaret Nazon and Michelle Holmes
3: Y3/4	<p>Cooking and Nutrition: Journey of food</p> <p>Construction: Electrical systems</p>	<ul style="list-style-type: none"> • Adapted recipes/instructions • 'Where does it come from?Where does it go?' (Electricity) • 'Exciting Electrics' (Design Challenge)
2: Y1/2	<p>Textiles Wheels and axels</p>	<ul style="list-style-type: none"> • Decodable captions/sentences aligned to need for example, 'it is strong' 'it is sharp' • Key vocabulary from progression documents

Assessment in design and technology

Children will be assessed prior to a unit of design and technology beginning and the lessons will be planned to teach from any misconceptions they may have. This prior knowledge assessment allows children the opportunity to demonstrate any connected knowledge held in their long term memory. They will also be assessed at set intervals after the end of a unit, (2 weeks, 6 weeks and 12 weeks), to recall this knowledge and to ensure that the knowledge has been fully embedded in their long term memory. In addition to this, there will be planned opportunities for recaps throughout the unit to ensure knowledge is retained.

In the academic year 2021-2022, all of the relevant previous year's learning will be included in the knowledge checks in order to mitigate any learning loss due to COVID-19. End of topic assessment takes place approximately two weeks after the end of the topic. Two further knowledge checks take place approximately six weeks and then twelve weeks later in order to ensure that the knowledge is embedded in the children's long term memory.

Termly, the children's work will be moderated by the staff in order to substantiate the class teacher's assessment. Final pieces will be compared and ranked following the same process as the 'No More Marking' system in English. The 'process' undertaken to arrive at the finished pieces will also be taken into account.

Enhancements

Each year, a series of visits and visitors are planned to enhance the children's knowledge and cultural capital. For example, the children in upper key stage two go to Northumberland on residential and explore the environment, carrying our fieldwork.

	2020-2021	2021-2022	2022-2023
Clubs		Construction club	Construction club
Visits and visitors		DT Challenge Art exhibition	DT Challenge Art exhibition

Reviewed: September 2022