ST ANNE'S RC PRIMARY SCHOOL

DESIGN AND TECHNOLOGY CURRICULUM HANDBOOK

Design Technology Prayer

Father in heaven,

Help us to approach Design and Technology with fairness and respect, acknowledging the value of each person's ideas and contributions. May we use our skills and knowledge to create solutions that benefit ourselves and others. May we look to your divine creations as an inspiration for our own creativity.

If we experience success and achievement in our design accomplishments, grant us the humility to be happy and grateful, recognising that our talents are gifts from you. Should we face setbacks or challenges, give us the strength to persevere with our creations.

In Jesus' name,

Amen

Psalm

"But now, Oh Lord, you are our Father. We are the clay, you are the potter; we are all the work of your hand".

Isaiah 64:8

National curriculum

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.

Attainment targets

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Subject content Key stage 1

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment].

When designing and making, pupils should be taught to:

Design

- design purposeful, functional, appealing products for themselves and other users based on design criteria
- generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology

Make

- select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]
- select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics

Evaluate

- explore and evaluate a range of existing products
- evaluate their ideas and products against design criteria

Technical knowledge

- build structures, exploring how they can be made stronger, stiffer and more stable
- explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.

Key stage 2

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].

When designing and making, pupils should be taught to:

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.

Cooking and nutrition

As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.

Pupils should be taught to:

Key stage 1

- use the basic principles of a healthy and varied diet to prepare dishes
- understand where food comes from.

Key stage 2

- 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 seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed

Intent

At St Anne's RC Primary School, we have adopted the "Kapow" Primary Scheme of Work, tailored to ensure comprehensive coverage of the National Curriculum objectives.

Our Design and Technology (DT) curriculum is designed to inspire creativity, innovation, and practical problem-solving skills in our children. We adhere to the National Curriculum's framework of **Design, Make, Evaluate**, and **Technical Knowledge**, ensuring a comprehensive approach that equips our students with essential skills for their future.

We believe that cooking is a vital life skill, and therefore, we have incorporated a cooking topic in each year group. This not only teaches children how to prepare healthy meals but also instils an appreciation for nutrition and the joy of cooking.

In our curriculum, we focus on two electrical systems as covered in science and two digital systems as explored in computing. This streamlined approach allows us to deepen our students' understanding of these critical areas without overwhelming them, ensuring they grasp the foundational concepts effectively.

To enrich our curriculum further, we have integrated the study of key designers, inventors, architects, and chefs. By showcasing diverse careers within the field of design and technology, we inspire our children to explore various pathways and understand the impact of creativity and innovation in the world around them.

Design and Technology is essential as it fosters critical thinking, encourages collaboration, and enhances problem-solving abilities. It empowers our children to become resourceful and enterprising individuals who can navigate an increasingly technological world. Through DT, we aim to cultivate a generation of innovative thinkers who can contribute positively to society.

In summary, our DT curriculum is not just about making products; it's about nurturing the skills and mindset necessary for our children to thrive in a dynamic and evolving landscape.

Implementation

EYFS:

EYFS – DT Understanding the world, PSED, Physical development, Expressive art & design (links to DT)	
Nursery (birth to 3 Development matters)	Birth to 3 (Development matters) Expressive arts and design Start to make marks intentionally Express ideas and feelings through mark making and sometimes give a meaning to the marks they make Explore different materials using all their senses to investigate them Manipulate and play with different materials

	Use their imagination as they consider what they can do with what they can do with different materials Make simple models which express their ideas **Physical development** Reach out for objects as coordination develops Pass things from one hand to another Let go of things and hand them to another person Build independently with a range of resources Use large and small motor skills to do things independently Develop manipulation and control Explore different materials and tools **Communication and language** Listen and respond to a simple instruction. Understand simple instructions like "give to me" or "stop" Start to develop conversation, often jumping from topic to topic. Understand single words in context – 'cup', 'milk'. **Understanding the world** Explore materials with different properties. Explore natural materials, indoors and outside **PSED** Establish their sense of self. Express preferences and decisions. They also try new things and start establishing their autonomy. Thrive as they develop self-assurance. Grow in independence, rejecting help ("me do it").
Nursery (Three and four year olds, Development matters)	**Understanding the world** Explore collections of materials with similar and/or different properties. Use all their senses in hands-on exploration of natural materials. Talk about what they see, using a wide vocabulary. Explore how things work **PSED** Select and use activities and resources, with help when needed. This helps them achieve a goal they have chosen or one that is suggested to them. Increasingly follow rules, understanding why they are important. Remember rules without needing an adult to remind them. Develop appropriate ways of being assertive. Make healthy choices about food & drink. **Physical development** Choose the right resources to carry out their own plan. Use one handed tools and equipment, for example, making snips in paper with scissors. Match their developing physicals skills to tasks and activities in a setting. Use a comfortable grip and show preference for a dominate hand. **Expressive arts and design**

	Make imaginative and complex small worlds with blocks and construction kits, such as a city with different buildings and a park. Explore different materials freely, in order to develop their ideas about how to use them and what to make. Develop their own ideas and then decide which materials to use to express them. Create closed shapes with continuous lines, and begin to use these shapes to represent objects. Join different materials and explore different textures Respond to what they have heard expressing their thoughts and feelings. **Communication and language** Use a wider range of vocabulary. Use longer sentences of four to six words.
Reception (Development matters)	**Physical development** Progress towards a more fluent style of moving, with developing control and grace. Develop their small motor skills so that they can use a range of tools competently, safely and confidently. Use their core muscle strength to achieve a good posture when sitting at a table or sitting on the floor. **Expressive arts and design** Return to and build on their previous learning, refining ideas and developing their ability to represent them. Create collaboratively, sharing ideas, resources and skills. **Communication and language** Learn new vocabulary. Articulate their ideas and thoughts in well-formed sentences. Connect one idea or action to another using a range of connectives. Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. Use new vocabulary in different contexts. **Understanding the world** Explore the natural world around them. **PSED** Show resilience and perseverance in the face of challenge. Manage their own needs. - Personal hygiene/Food hygiene Know and talk about the different factors that support their overall health and wellbeing: - healthy eating
Reception ELG (EYFS Framework)	**ELG: physical development – (fine motor skills)** Use a range of small tools, including scissors, paintbrushes and cutlery. Hold a pencil effectively in preparation for fluent writing - using tripod grip. Begin to show accuracy and care when drawing. **ELG: expressive arts & design – (creating with materials)** 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. **ELG communication & language**

	Autumn 2	Spring 2	Summer 2
Nursery	House junk modelling	Making a moving character	Porridge
Reception	Divali lamps	Chinese new year dragons Valentines bugs	Pancakes

Express their ideas and feelings about their experiences using full sentences, including use of past, present and future tenses and making use of conjunctions, with modelling and support from their teacher.

ELG Understanding the world

Explore the natural world around them, making observations and drawing pictures

ELG Personal, social & emotional development

Set and work towards simple goals, being able to wait for what they want and control their immediate impulses when appropriate.

Give focused attention to what the teacher says, responding appropriately even when engaged in activity, and show an ability to follow instructions involving several ideas or actions.

Be confident to try new activities and show independence, resilience and perseverance in the face of challenge.

Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.

EYFS overview

EYFS DT curriculum

Topic

Continuous provision ongoing

	Cooking and nutrition	Mechanism	Structures	Textiles	Electrical systems	Digital world
Nursery	Noodles Porridge	Making a moving character	House junk modelling (the three little pigs) Playdough moulding Small world contruction blocks Contruction bricks	Exploration of different textures and materials (in cp/ 'that's not my' story books Fine motor threading	Exploring and using torches	Mark making on interactive white board Playing interactive games
Reception	Pancakes Bread making	Chinese new year dragons Valentines love bugs	divali lamp – paper – glue and stick decorating playdough moulding Small world contruction blocks Contruction bricks	Exploration of different textures and materials (in cp/ 'that's not my' story books Fine motor threading	Exploring word sound buttons	Jit 5 – online mark making programme

KS1 and KS2 overview:

	Cooking and nutrition	Mechanisms	Structures	Textiles	Electrical systems	Digital world
Year 1	Smoothies		Constructing a windmill	Puppets		
Year 2	Balanced diet	Making a moving monster	Baby bear's chair	Pouches		
Year 3	Eating seasonally	Pneumatic toys		Cross stitch and appliqué		
Year 4	Adapting a recipe	Making a slingshot car	Pavilions			
Year 5	Developing a recipe				Doodlers	Monitoring devices
Year 6	Come dine with me				Steady hand game	Navigating the world

	Autumn 2	Spring 2	Summer 2
Year 1	Constructing a windmill	Puppets	Smoothies
Year 2	Making a moving monster Pouches	Baby bear's chair	Balanced diet
Year 3	Eating seasonally	Pneumatic toys *option 2*	Cross stitch and appliqué
Year 4	Adapting a recipe	Making a slingshot car	Pavilions
Year 5	Doodlers	Developing a recipe	Monitoring devices
Year 6	Steady hand game	Come dine with me	Navigating the world

KEY:	Cooking and nutrition	Mechanisms	Structures	Textiles	Electrical systems	Digital world

Assessment

At St. Anne's RC Primary School, Design and Technology (DT) assessment is a combination of summative and formative approaches, using both the *Kapow* resources and teacher judgment.

Summative Assessment:

1. **Self-evaluations**: Students reflect on their learning, helping them assess their own progress.
2. **End-of-topic quizzes**: These assess the knowledge and vocabulary understanding of the students, gauging how well they have retained key concepts.
3. **Final product**: The project or final product created by students tests their disciplinary knowledge and the skills they've developed throughout the unit.

Formative Assessment:

Feedback typically occurs at three key stages in the learning process:

1. **Live marking** – where teachers actively circulate the classroom, checking for misconceptions and addressing them immediately during the teaching moment.
2. **Tick and Fix feedback** – where children engage in reviewing their work by ticking correct answers and fixing errors at the end of a lesson or chunk of task, promoting independence and ownership of their learning.

3. **Whole class feedback folder** – offered away from the immediate teaching context.

These stages are prioritised based on their effectiveness, with **live marking** being the most impactful for driving further improvement. At St Anne's, we place significant emphasis on this approach, as it allows teachers to provide instant, tailored feedback that directly addresses misconceptions, enhancing the learning experience in real-time.

The **"tick and fix"** method further empowers children to take responsibility for their learning, as they actively identify and correct their mistakes, fostering independence in their own learning.

Whole **class feedback folders** are used to identify further misconceptions and it often serves to inform adjustments in teaching practises such as pre-teach, small group intervention, 1:1 teaching, adjusting planning such as incorporating into 'review' or reteaching the lesson again. Whole class feedback folders are also used to support teacher assessment and identify patterns or further support ie: home learning. Subject leaders also use the folders to identify patterns, common misconceptions and help adapt/ tweak the curriculum and assessment.

This approach ensures that assessment is ongoing and aligned with the objectives of the DT curriculum, allowing for targeted feedback and meaningful learning progression.

DT concepts

In Design Technology (DT), it is essential for children to develop both substantive knowledge and disciplinary (technical) knowledge. Understanding the distinction between these two types of knowledge will enhance the learning experience and enable children to apply their understanding effectively in practical contexts.

Substantive Knowledge

Substantive knowledge refers to the factual information and concepts that children need to know within the subject of Design Technology. This includes:

- **Key Concepts**: Knowledge about materials (e.g., properties of wood, metal, plastic), tools, and techniques used in design and making processes.
- **Design Principles**: Understanding the principles of good design, including aesthetics, functionality, and user needs.
- **Historical Context**: Knowledge of significant designers and technological advancements that have shaped the field.

Examples of Substantive Knowledge in DT:

- Recognising different types of materials and their properties.
- Understanding the importance of ergonomics in product design.
- Identifying the stages of the design process.

Disciplinary Knowledge (Technical Knowledge)

Disciplinary knowledge, often referred to as technical knowledge in the context of Design Technology, encompasses the skills and procedures that children learn to apply their substantive knowledge effectively. This includes:

- Design: The ability to conceptualise and plan a product, including sketching ideas and creating design specifications.
- Make: Practical skills involved in constructing products, from selecting materials to using tools and equipment safely and effectively.
- Evaluate: The capacity to assess the effectiveness of designs and products, including testing and refining ideas based on feedback.
- Technical Knowledge: Understanding the processes and techniques involved in making products, including knowledge of machinery, tools, and the implications of design decisions.

Examples of Disciplinary Knowledge in DT:

- Using CAD (Computer-Aided Design) software to create design prototypes.
- Applying safe practises when using hand tools and machinery.
- Conducting user testing to gather feedback on a product.
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The Interplay Between Substantive and Disciplinary Knowledge

A high-quality Design Technology curriculum integrates both substantive and disciplinary knowledge. This integration allows children to:

- Design: Use their understanding of materials (substantive knowledge) to create innovative designs (disciplinary knowledge).
- Make: Apply their knowledge of tools and techniques (technical knowledge) to construct their designs effectively.
- Evaluate: Assess their work using criteria based on design principles (substantive knowledge) and technical performance (disciplinary knowledge)

Lesson design

Each lesson will follow the same structure for a consistent approach:

- Recap and recall
- Introduce WALT, success criteria & vocabulary word wall.
- Attention grabber
- Main event
- Wrapping it up

Lesson Design Summary

This lesson design follows a structured approach to ensure that students actively engage with and retain new knowledge. It is built on the principles of effective teaching strategies, including the *I do, we do, you do* model by Doug Fisher and Nancy Frey (2007), as well as adaptive teaching cornerstones that aim to foster independent learning. The lesson is designed to reduce cognitive overload and ensure the content is absorbed effectively through *chunking* and metacognitive strategies.

1. Recap and Recall (Review Prior Knowledge):

The lesson begins with a *recap and recall* phase, where children are encouraged to refresh or relearn knowledge from previous lessons. This step reinforces prior learning and prepares students for new content. Through active recall techniques, students are prompted to retrieve key information, setting the stage for the lesson's focus. This part helps bridge the gap between what students already know and the new content to be introduced.

2. WALT, Success Criteria, and Vocabulary Wall:

Next, the teacher introduces the WALT (We Are Learning To) statement. This informs the students about the specific learning objective of the lesson. Along with the WALT, the success criteria are shared, outlining how students can demonstrate that they have achieved the lesson's objective. These criteria give students a clear understanding of what is expected from them.

In this phase, the vocabulary wall is introduced. Teachers will define key terms that are central to the lesson using a dual coding activity. The vocabulary wall serves as a visual reference throughout the lesson, supporting students in their understanding of new concepts. The vocabulary words and definitions can be displayed on a slide and referred to as needed, helping students make connections with the subject matter.

3. Attention Grabber:

The *attention grabber* serves as an engaging introduction to the topic. This part of the lesson sparks curiosity and hooks students into the lesson by presenting relevant contextual information. It could involve an interesting fact, a thought-provoking question, or a brief activity designed to capture the students' attention and stimulate their interest in the content.

4. Main Event (Teaching Key Knowledge and Skills):

The *main event* of the lesson is where the teacher explicitly introduces new content, teaching the key knowledge and skills related to the topic. This phase follows the *I do, we do, you do* model of instruction. First, the teacher demonstrates the concept or skill (I do), then students practice together (we do), and finally, students apply the new learning independently (you do). By breaking down the lesson into manageable chunks, the teacher helps students process the information incrementally, preventing cognitive overload.

Scaffolding is provided throughout this phase, ensuring that all learners, regardless of ability, can access and engage with the content. Teachers can differentiate instruction and provide support as needed to guide students through the learning process.

5. Wrapping It Up (Reflection and Assessment):

The lesson concludes with a *wrap-up* phase that allows students to reflect on their learning. In this part, students engage in a mini self-assessment, checking their understanding of the lesson's key concepts. Depending on the lesson, students may also complete a design criteria checklist or an end-of-topic quiz, which helps reinforce the learning and assess the students' grasp of the material.

Teachers use this time to fill out assessment files, noting down gaps in understanding and identifying next steps for students who did not fully achieve the WALT. This helps to track student progress and inform future instruction.

Presentation Mode and Flexibility:

Teachers can utilize the Kapow website's presentation mode to easily access and present the lesson design in a structured format, ensuring consistency across lessons. Additionally, a separate vocabulary word wall slide can be created by the teacher and integrated after the *recap and recall* section, reinforcing the vocabulary introduced in the lesson.

Overall Structure:

By breaking the lesson into these manageable chunks, students can absorb information incrementally, reducing cognitive overload and ensuring better retention of key concepts. Teachers also employ metacognitive approaches, helping students become active

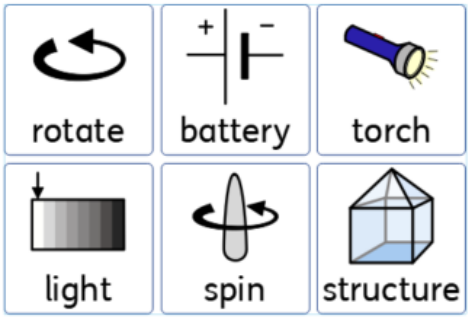
participants in their own learning. This structured approach, with its emphasis on scaffolding, explicit instruction, and reflection, supports independent learning and ensures that all students can succeed.

This adaptive teaching model aligns with the *St Anne's 5 a day* cornerstones, creating an environment where students are equipped to become confident, independent learners.

Vocabulary

At our school, new vocabulary is introduced at the beginning of each lesson, following the WALT (We Are Learning To) and success criteria. The focus is on ensuring that vocabulary linked to the current topic is retained by the students. To support this, a word wall and a dual coding activity is used, which helps connect words with visual representations. The vocabulary learned is continuously revisited throughout the topic via quizzes and the recap and recall sections of the future lessons, ensuring reinforcement and long-term retention.

For example: dual coding activity inprint word maps, PowerPoint presentations using audio.



At St. Anne's RC Primary School, we recognise the critical role of retrieval practice in enhancing children's ability to remember and apply knowledge. Retrieval practice involves actively recalling information from memory, which has been shown to strengthen neural connections and improve long-term retention. By regularly engaging children in activities that require them to retrieve previously learned material, we not only reinforce their understanding but also help them develop essential skills for independent learning. This approach allows children to identify gaps in their knowledge, address misconceptions and build a more interconnected understanding of the curriculum.

Knowing more and remembering more

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Beginning of every lesson	End of the lesson	End of the unit
All units have a recap and recall section at the beginning of lessons, so anything covered in a previous lesson is automatically revisited through a task before new knowledge is introduced. This provides children opportunity to recall prior knowledge and make connections between this and new learning in the lessons	At the end of the lesson, teachers will introduce a part of the lesson called 'wrapping it up'. This allows for children to reflect on their learning. In this part, students may engage in a mini self-assessment, checking their understanding of the lesson's key concepts and evaluating their work.	At the end of the unit children will take an end of unit quiz and evaluate their finished products (either verbally or on an evaluation template found on kapow)