

# Design & Technology

## Leasingham St. Andrew's Church of England Primary School

**'Everything you do, do in love'**

### Intent

In our school the teaching of Design and Technology demands that pupils are confident and resilient in order to achieve success. Pupils are encouraged to become independent, creative problem-solvers and thinkers as individuals and as part of a team. Our curriculum is planned so that pupils follow a process where evaluation and communication are key. Design and Technology projects allow pupils to apply skills from across the curriculum; mathematics, science, computing and art – to design, make and evaluate products that solve real and relevant problems.

The ambitions for our curriculum:

- **High aspirations permeate across the school.**
- **The school offers a host of cultural experiences and enrichment opportunities.**
- **Our pupils develop a love of life-long reading.**
- **British Values are an intrinsic part of the school.**

The study of Design and Technology plays a key role in these ambitions. At St Andrew's, we work hard to ensure Design and Technology delivers the national curriculum in full and has depth and breadth. Leading on from our school vision: 'Positive participants of our world community', we want Design and Technology to become beneficial and significant in shaping the children's lives. We believe that our children should have big ambitions and we want the Design and Technology curriculum to support this.

In a world where engineering, technology and design are critical; we want to ensure the children know about the things that are possible in their future and that they can be part of it. Engineering is about making the world a better place, this is an extremely important message that we want our children to understand. As teachers, it is our job to inspire the future and at the St Andrew's, we do this through having an engaging and inspiring Design and Technology curriculum.

Our Design and Technology teaching uses a problem solving and communication process to support learning and developing new skill. We want to create critical thinkers and shape learning which allows pupils to learn for themselves.

High Aspirations	High standards of expectations which are the same as core subjects. Allow children to have a deeper understanding of events such as why, how, and when. Use of precise and technical vocabulary to extend children's knowledge.
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	<p>Questioning throughout the lesson that extend knowledge and tests for reliability.</p> <p>Encourage children to embrace challenge, question themselves and enjoy working hard</p>
Life-long love of reading	<p>Guided reading and Literacy focus – text-based writing to encourage non-fiction – Science topics</p>
Cultural Experiences and Enrichment	<p>Year five &amp; six had an afternoon of meeting a motor racing team driver and understanding how the car design enables the driver to be the best he can,</p> <p>Year 4 visit Energy from Waste site to see design, technology and science linked together to solve a modern day problem of clean energy generation.</p> <p>Classroom has non-fiction books on display that link to topic. Book links are on topic walls.</p> <p>Knowledge organiser quizzes/assessment at the end of each subject.</p> <p>Certain topics are taught through text-based writing. E.g. y6 evolution and inheritance.</p>
British Values Democracy Rule of Law Individual Liberty Tolerance & Respect	<p>Listening to the children's opinions and sharing their ideas.</p> <p>Taking turns.</p> <p>Knowing there are consequences if safety rules are ignored.</p> <p>Using the fair testing rule as a way of following guidance.</p> <p>Making their own choices when planning an investigation</p> <p>Others may have different views on where to start.</p> <p>Researching famous scientists and understanding their backgrounds, where they came from, their home life and early childhood.</p> <p>Religious beliefs can often compete with scientific understanding.</p> <p>Discussing safely and appropriately causes and protests across the world, based on animal rights or saving the environment.</p> <p>Debating these ideas in a calm manner and age appropriate.</p> <p>Allowing children the chance to choose their resources and have a say in their experiments</p> <p>Working as a team &amp; Offering advice.</p>

## Curriculum Knowledge

The Design and Technology curriculum is carefully structured and sequenced to ensure coverage and progression as the children move through the school. The curriculum is broken down into knowledge building blocks and the knowledge is sequenced and then built upon over time: what has been taught before and what the pupils' need to know to reach their end point - spiral progression. This is set out in more detail in our termly plans. The enquiry questions and the key vocabulary are implemented in our knowledge organisers and brought to life on working walls and within the learning objectives for the lesson. There are specific curriculum areas of knowledge that build together to enable our children to become successful in all area of Design and Technology.

### In KS1 these are:

#### 1. 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

2. 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

3. Evaluate

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

4. 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

5. Food and Nutrition

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

**In KS2 these are:**

1. 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

2. 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

3. 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

#### 4. 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

#### 5. 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 seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.

### **Application of knowledge**

To enable our children to become successful in Design and Technology, we have identified the application of knowledge that will be needed. The application of knowledge for each area of Design and Technology studied is identified and this knowledge can then be applied across the whole of the curriculum so our children leave our school 'knowing more and being able to do more'. This is set out in more detail in our termly plans.

• Investigation • Expression • Interpretation • Application • Analysis; • Synthesis •

Evaluation

### **INVESTIGATION – in Design and Technology this includes:**

- asking relevant questions;
- using a variety of sources to find out about events, people, processes and changes.
- carrying out investigative work to develop a better knowledge of products around us.

### **EXPRESSION – in Design and Technology this includes:**

- the ability express opinions (using product knowledge.) • the ability to suggest how products work in the real world.

### **INTERPRETATION – in Design and Technology this includes:**

- the ability to use technical vocabulary to describe and explain different products and talk about their purpose in making the world a better place.
- the ability to interpret the purpose of products and how they benefit the world.
- The ability to interpret a design brief.

**APPLICATION – in Design and Technology this includes:**

- applying new skills to making products.
- applying designing skills to suit a design brief.
- balancing need, purpose and aesthetic qualities.

**DISCERNMENT – in Design and Technology this includes:**

- explaining the importance of products.
- developing insight into design, designers, skills and needs.
- seeing clearly for themselves how products might improve the world we live in.

**ANALYSIS – in Design and Technology this includes:**

- distinguishing between opinion, belief and fact.
- using product research to draw conclusions or suggest hypotheses.
- distinguishing between the need of the product and the benefit of it.
- understanding the purpose of a design brief and how to best achieve it.

**SYNTHESIS – in Design and Technology this includes:**

- understanding the balance of product development in improving the world.
- connecting different aspects of life for people across the world to create product which will support and benefit.

**EVALUATION – in Design and Technology this includes:**

- the ability to evaluate a product.
- weighing up the respective evidence available and reach conclusions.

**Processes for Effective Learning in Design and Technology**

1. Identify questions.

These covers identifying questions and defining enquiries, using a range of methods, media and sources.

It includes the skill of investigation.

2. Plan and carry out enquiries.

This includes carrying out and developing enquiries by gathering, comparing, interpreting, and analysing a range of information, ideas and viewpoints.

3. Present and explain findings.

This involves expressing and explaining ideas and feelings, suggesting interpretations of findings and analysing the range of information.

4. Empathise and reflect.

This involves using empathy, critical thought and reflection to consider their learning and how they feel about it.

5. Evaluate.

This involves evaluating their learning and considering how it might apply to their own lives.

**The Daily Implementation of Design and Technology at St Andrew's**

- Knowledge Organisers: Children have access to key knowledge, language and meanings to understand.

**Design and Technology and to use these skills across the curriculum.**

- Subject specific vocabulary: Identified through knowledge organisers and working walls and highlighted to the children at the beginning of and during lessons.
- EYFS: Reception children are given a secure grounding in the Prime Areas of learning, ensuring they have a good foundation on which to build through the specific areas, including Understanding the World. Areas of provision are enhanced to ensure vocabulary understanding and extension and develop understanding of the world around them.
- Books: Children will have access to a growing variety of subject specific fiction and non-fiction books, available in Design and Technology lessons, other lessons and in the class book area. Wherever possible, children will use a range of non-fiction books which include elements of design. This is especially important during food and nutrition lessons.
- Use of existing product artefacts: Where possible we use existing products for children to explore and investigate. We believe that handling real objects enhanced the children's knowledge, understanding and skills.
- Consistent teaching sequence: Design and Technology lessons will include a range of learning opportunities including putting the learning in the big picture, placing of the area being studied in the context of previous learning, a brief review of learning covered in previous lesson/s, specifying key vocabulary to be used and its meaning, conducting product investigation, design skills followed by a design and make assignment. Ensuring that children will be designing and making an achievable product.
- Learning environment: The learning environment is designed to ensure children develop their Design and Technology knowledge and continue to know more and remember more. Working walls are key drivers to this, with teachers referring to them during lessons.
- Research: Children will be asked to research products and processes in relation to aspects of their learning independently. This allows the children to have ownership over their curriculum and lead their own learning.

- Basic skills -English, Maths and ICT skills are taught during discrete lessons but are revisited in Design and Technology so children can apply and embed the skills they have learnt in a purposeful context.

The expectation is that standards in writing in Design and Technology are comparable with standards in English lessons.

- Cultural Capital - We plan visits, visitors and in-school WOW days to provide first-hand experiences for the children to support and develop their learning.
- Hands on experiences with equipment.

### **Impact**

Learning ABOUT Design and Technology also enables learning FROM Design and Technology. It will:

- Develop increasingly critical and analytical thinkers.
- Increase their understanding of their place in the world.
- Develop and use skills of enquiry, analysis, interpretation and evaluation.
- Develop an interest in the wider world around them.
- Develop a sense of identity through learning about how they can impact on the wider world.
- Develop a love of reading through the use of design, engineering and food-based texts.
- Forge an understanding of British values of respect and tolerance of others and a sense of cultural capital which places their Design and Technology knowledge in context.
- Explain not only about the world but also how it works, how it fits together and how to make a difference and become positive contributors to it.
- Ensure the children develop the key skills they need to evaluate and see products in a different light.
- Ensure that children know there are a range of different ways which products are designed and developed.
- Allow children to understand that without Design and Technology the world would not be as it is now. They will know that through Design and Technology they will be able to improve the world we live in. This is through a never-ending cycle of investigation – design – make and improve.
- Ensure children know they can make a difference to the world they live in.
- Children are aware of how to use a variety of equipment safely and purposefully.