

# Loudwater Combined School

September 2023

## Design and Technology Policy

### Aims of the Policy

- To describe current good practice in the teaching and learning of Design and Technology (D&T) at Loudwater Combined School.
- To provide guidelines which enable the delivery of the National Curriculum (NC) for D&T through units of the Concentric Curriculum.
- To emphasise the potential of problem solving and creative elements of D&T.
- To guide children towards using and applying cross-curricular skills and knowledge through D&T.
- To have regard for the health and safety of all users and know how to use tools and materials appropriately.
- To provide a curriculum that has equal opportunities and is accessible to all pupils.
- To have regard for assessment in the subject, leading to summative and formative reports about a pupil's attainment.

### Intent

As a staff, we aim to provide:

- Equal opportunities – all pupils will work with a wide range of materials and will be encouraged to broaden their experience of unfamiliar materials.
- Teachers will allow sufficient time for children to record work completed and provide space to display finished products.
- Activities should allow pupils to generate ideas, be creative and attempt to solve problems systematically.
- Where appropriate, activities should be open-ended and scaffolded to meet the needs of all learners.

### Aims and Objectives of Teaching Design and Technology

- To develop the children's designing skills: generating and developing ideas, clarifying a task, creating design proposals, communicating ideas, planning and evaluating.
- To develop the children's making skills: working with materials and components, tools and processes, eg: planning, measuring and marking out, cutting and shaping, joining and combining, finishing and evaluating.
- To develop knowledge and understanding.
- To develop their capacity to create high quality products through combining their designing and making skills with knowledge and understanding.
- To nurture creativity and innovation through designing and making.
- To explore values about and attitudes to the world and how we live and work within it.
- To develop an understanding of technological processes, products, their manufacture and their contribution to society.
- To examine links with the local community.
- To apply value judgements of an aesthetic, economic, moral, scientific and technical nature.

### Implementation

#### The Design and Technology process

The D&T process is an ongoing model that informs children's learning and progress throughout their primary education. This is imbedded in the teaching of D&T.

## **Early Years Foundation Stage**

We teach D&T as an integral part of the topic work covered during the year. We relate the D&T elements of the children's work to the objectives set out in the Early Learning Goals (ELGs) profile which underpins the curriculum planning for children aged three to five. D&T makes a significant contribution to the Areas of Learning and ELG objectives of:

- Understanding of the World
- Physical Development
- Expressive Arts & Design

### **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, 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

#### **Evaluate**

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

### **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
- 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.

#### **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

## **ICT**

When planning and teaching units of work teachers should, where relevant, look for opportunities to use ICT including internet based research, design programmes and the use of learn-pads for investigation and evaluation.

### Food Technology

The NC emphasis on cooking and nutrition and maintaining the principles of a healthy and varied diet is provided for within food technology lessons.

### Teaching and Learning

D&T teaching focuses on enabling children to acquire and apply knowledge and understanding of: materials and components, mechanisms and control systems, structures, food technology, existing products, quality, health and safety.

At Loudwater School we recognise the fact that in all classes there are children of widely different abilities in Design and Technology and we seek to provide suitable learning opportunities for all children by matching the challenge of the task to the ability and learning style of the child. We achieve this by:

- Setting common tasks which are open-ended and can have a variety of responses.
- Setting tasks of increasing difficulty.
- Providing resources of different complexity depending on the ability of the child.
- Using teaching assistants to support children individually or in groups.

### Design & Technology Curriculum Planning

We use the national curriculum for Design and Technology and the Chris Quigley Curriculum Companion as the basis for our curriculum planning. We ensure that there are opportunities for children of all abilities to develop their skills, knowledge and understanding in each unit taught. We plan for progression in Design & Technology in order that children are increasingly challenged as they move up through the school. Learning takes place each term, over a two to three-week period.

### Whole School Design & Technology Curriculum map

Foundation stage		
Autumn EAD/ UTW Making Bread, Handa's Fruit salad, Recycled sculptures	Spring EAD/ UTW 3 Bears' Porridge, Turnip Soup, Places of worship, Fairies	Summer EAD/ UTW Mini-beast gardens, Space rockets
Year 1		
Autumn 1.3 Frame Structures Chairs for a teddy	Spring 1.9 Couscous Designing and preparing couscous recipes	Summer 1.5 Slider Mechanisms Slider pictures
Year 2		
Autumn 1.4 Solid Structures Bridges	Spring 1.8 Portable snacks Designing and preparing wraps	Summer 1.6 Lever Mechanisms Rubbish grabbers
Year 3		
Autumn 2.7 Shell Structures Making dice	Spring Fruit salad Designing and preparing fruit salad	Summer 2.4 Linked Levers Folding safety barriers
Year 4		
Autumn 2.6 Frame Structures Truss bridges	Spring 2.9 Dips Designing and preparing hummus	Summer 2.3 Paper circuits LED cards
Year 5		
Autumn 3.5 Frame structures Kites	Spring 2.8 Vegetable Soup Designing and preparing soup	Summer 2.5 Pneumatics A pneumatic lifting device

Year 6		
Autumn 3.3 Electronic Motors A motor powered vehicle	Spring Fairtrade packaging Designing and labelling of food packaging	Summer 3.6 Pulleys and Gears Cable cars

## Design & Technology - Progression and Skills Map

Purpose of study		
The ELGs below all go towards giving FS pupils the basic skills, knowledge and vocabulary that they will need to engage fully with the Design & Technology Curriculum as they transition to Key Stage One.	Design & 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.	
	Aims	
	The national curriculum for Design & Technology aims to ensure that all pupils: <ul style="list-style-type: none"> <li>develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world</li> <li>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</li> <li>critique, evaluate and test their ideas and products and the work of others</li> <li>understand and apply the principles of nutrition and learn how to cook.</li> </ul>	
EYFS	Key Stage 1	Key Stage 2
<p><b>Communication and Language</b> Speaking Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary. Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate.</p> <p><b>Personal, Social and Emotional Development</b> Managing Self Be confident to try new activities and show independence, resilience and perseverance in the face of challenge.</p>	<p>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:</p> <p>Design</p> <ul style="list-style-type: none"> <li>design purposeful, functional, appealing products for themselves and other users based on design criteria</li> <li>generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology</li> </ul> <p>Make</p> <ul style="list-style-type: none"> <li>Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]</li> <li>select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics</li> </ul> <p>Evaluate</p> <ul style="list-style-type: none"> <li>explore and evaluate a range of existing products</li> <li>evaluate their ideas and products against design criteria</li> </ul>	<p>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:</p> <p>Design</p> <ul style="list-style-type: none"> <li>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</li> <li>generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</li> </ul> <p>Make</p> <ul style="list-style-type: none"> <li>select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</li> <li>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</li> </ul> <p>Evaluate</p> <ul style="list-style-type: none"> <li>investigate and analyse a range of existing products</li> <li>evaluate their ideas and products against their own design criteria and consider the views of others to improve their work</li> <li>understand how key events and individuals in design and technology have helped shape the world</li> </ul> <p>Technical knowledge</p> <ul style="list-style-type: none"> <li>apply their understanding of how to strengthen, stiffen and reinforce more complex structures</li> <li>understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]</li> <li>understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]</li> <li>apply their understanding of computing to program, monitor and control their products.</li> </ul>

<p><b>Physical Development</b> Fine Motor Skills Hold a pencil effectively in preparation for fluent writing – using the tripod grip in almost all cases. Use a range of small tools, including scissors, paintbrushes and cutlery. Begin to show accuracy and care when drawing.</p> <p><b>Expressive Arts and Design</b> 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.</p> <p><b>Continuous Provision</b> The following activities are regularly available as part of the Continuous Provision that the pupils can access at any point when they are not directly involved in an adult Guided Session.  Use of the Creative area – mark making with a variety of materials, cutting and sticking/ joining activities, playdough, junk modelling etc.  Construction kits – Lego, Duplo, Cogs, building bricks, Large Play Bricks, Waffle blocks etc. Toy vehicles Jigsaw puzzles Pegs and pegboards</p>	<p>Technical knowledge</p> <ul style="list-style-type: none"> <li>build structures, exploring how they can be made stronger, stiffer and more stable</li> <li>explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.</li> </ul>					
	<b>Design</b>					
	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>
	Design simple products that work and look appealing. Discuss and draw ideas to communicate.	Design products for others and themselves that are purposeful, functional and appealing. Generate, develop, model and communicate ideas through talking, drawing, and templates.	Communicate ideas using different strategies eg discussion, sketch, diagrams. Use research to inform design.	Communicate, generate and develop ideas using a range of strategies eg prototypes, pattern pieces. Use research to inform design and develop design criteria.	Communicate, generate, develop and model ideas using a range of strategies eg cross-sectional and exploded diagrams. Use research to inform design and generate own design criteria.	Communicate, generate and develop ideas, drawing on other disciplines eg science, maths, computing. Use research to inform innovative design and generate own design criteria. Confidently take calculated risks to become innovative, resourceful and enterprising.
	<b>Make</b>					
	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>
	Use a range of materials and components. Use a range of tools and equipment to perform practical tasks eg cut, shape, join and finish.	Select from and use a wide range of materials and components (according to their characteristics). Select from and use a wide range of tools and equipment to perform practical tasks eg cut, shape, join and finish.	Select from and use a wide range of tools, equipment, materials and components accurately.	Select from and use a wider range of tools, equipment, materials and components accurately to make prototypes.	According to their functional properties and aesthetic qualities, select from and use a wide range of tools, equipment, materials and components accurately to make high quality prototypes.	According to their functional properties and aesthetic qualities, select from and use a wide range of tools, equipment, materials and components accurately to make high quality prototypes.
	<b>Evaluate</b>					
	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>
	Explore existing products eg home, school Discuss own ideas and designs	Explore and evaluate a range of existing products eg home, school Evaluate own ideas and designs against given design criteria.	Evaluate own ideas and designs against given design criteria and consider the views of others to improve their work. Investigate a range of existing products that address real / relevant problems, in a range of relevant contexts.	Evaluate own and others' work suggesting improvements and consider the views of others to improve their work. Investigate a range of existing products in a range of relevant contexts eg culture, industry.	Generate own design criteria and evaluate ideas and products against these. Investigate and analyse a range of existing products that address real / relevant problems, in a range of relevant contexts.	Generate own design criteria and critique ideas and products against these. Explain and understand how key events and individuals in D&T helped to shape the world
	<b>Technical Knowledge</b>					
	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>
	Start to build structures, exploring ways to stiffen, stable and strengthen	Build structures, exploring ways to stiffen, stabilise and strengthen	Apply understanding of how to strengthen, stiffen and reinforce structures.	Apply understanding of how to strengthen, stiffen to reinforce more complex structures.	Construct more complex structures by applying range of strategies to solve real / relevant problems.	Construct more complex structures by applying range of strategies to solve real / relevant problems.

Beads and Tweezers Choice of healthy snacks at the Snack Table.	Explore simple mechanisms.	Explore and use mechanisms eg levers, wheels and axles.	Identify range of mechanical systems and how they work (gears, pulleys, cams, levers and linkages).	Identify a wider range of mechanical systems and how they work (gears, pulleys, cams, levers and linkages). Use understanding of electrical systems (series circuits, switches, bulbs and motors).	Drawing on disciplines & making connections to wider subject areas, apply understanding of computing to program, monitor and control products. Making connections to real & relevant problems, apply understanding of wider range of mechanical systems (gears, pulleys, cams, levers and linkages).	Making connections to real & relevant problems, apply understanding of wider range of mechanical systems (gears, pulleys, cams, levers and linkages). Making connections to real & relevant problems, apply understanding of electrical systems (series circuits, switches, bulbs and motors)
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### Cooking and nutrition

Foundation Stage	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Hygiene routines – washing hands before preparing / eating food. Introduction to cooking and nutrition through joint preparation of food.	Begin to understand where food comes from. Prepare simple dishes using knowledge of healthy food.	Use basic principles of a healthy and varied diet to prepare dishes. Understand where food comes from.	Apply principles of a healthy, varied diet when preparing variety of dishes.	Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. Know where and how a variety of ingredients are grown, reared, caught and processed.	Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. Apply understanding of seasonality and its link to ingredients.	Know where and how a variety of ingredients are grown, reared, caught and processed and its impact on meal design. Develop crucial life skill of feeding themselves and others affordably and well.

## Cross curricular links

### English

- Children develop language skills through questioning, describing and explaining, presenting their own ideas using different writing styles for different audiences.
- Read non-fiction texts and extract information.
- Use correct and precise language e.g. up and down movement to describe a moving picture.

### Science

- Apply scientific skills e.g. predicting and fair testing.

### Mathematics

- Apply mathematical skills e.g. measuring, drawing and interpreting tables and bar charts.

### Art & Design

- Apply art skills e.g. investigating texture and colour or recording visual information.

## Teaching Design & Technology to children with Special Educational Needs and Disabilities

We teach D&T to all children, whatever their ability. D&T forms part of the school's curriculum policy to provide a broad and balanced education to all children. We provide learning opportunities matched to the needs of children with learning difficulties and we take into account the targets set out for individual children in their EHCPs.

## Resources

Consumable resources are stored centrally in the Stock Cupboard and will be restocked as required. Equipment is stored in The Resource/SEND room. The D&T Lead will order the necessary components that each scheme requires

## Health and Safety

All units are taught with reference to the school Health and Safety policy. Risk assessments are carried out as appropriate by the class teacher, and timings can be flexible to allow for support staff to be available.

## **Impact**

### **Assessment and recording**

- We assess children's work in D&T by making informal judgements as we observe them during each lesson. During and on completion of a piece of work children are encouraged to self-assess (evaluate) their work and the work of their peers. The teacher can comment as necessary to provide constructive feedback. At the end of a unit of work the teacher makes a summary judgement comment about the class in relation to the Early Learning Goals / QCA outcomes and NC expectations. In Key Stage 1 and 2, each pupil will save completed work (such as research, design sheets, photographs and evaluations) in their IPC book. This provides evidence of the progression and continuity of each individual's learning in Design and Technology. Teachers use these to produce a summative statement that accurately reflects the child's performance in D&T throughout the year.
- Children's progress will be communicated to parents and carers through parents' evenings and in the end of year written report.
- The class teacher and D&T subject leader is responsible for monitoring and recording examples of children's work in each year group and the D&T subject leader can support teachers to identify work completed that indicates a recognised NC level of achievement.

### **Monitoring and review**

- The work of the D&T subject leader involves supporting colleagues in the teaching of Design and Technology, being informed about current developments in the subject and providing a strategic lead and direction for the subject in the school.
- Children's learning, progression and understanding will be monitored throughout the year and recorded through photo and video evidence to be saved in the shared area or relevant Google community. More formal monitoring will involve the D&T leader and a member of the senior leadership team looking at work and speaking to children from all year groups.

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