Errington Primary School

This policy has been subject to an Equality Impact Assessment by:

Author/Reviewer:

SLT/EET:

Governors/Trustees:

Could/does the policy or procedure have a negative impact on one or more of the groups of people covered by the protected characteristics of equality? If so, how can this be changed or modified to minimise or justify the impact?

Could/does the policy have the potential to create a positive impact on equality by reducing and removing inequalities and barriers that already exist? If so, how can these be maximised?

Design Technology Policy

2021-22

What is Design Technology?

Design and technology gives young people the skills and abilities to engage positively with the designed and made world and to harness the benefits of technology. They learn how products and systems are designed and manufactured, how to be innovative and to make creative use of a variety of resources including digital technologies, to improve the world around them.

Rational

Design and Technology prepares children to take part in the development of today's rapidly changing world. The subject encourages children to become independent and creative problem-solvers, both as individuals and as part of a team. It enables them to identify needs and opportunities and to respond by developing ideas and eventually making products and systems. Through the study of Design and Technology they combine practical skills with an understanding of aesthetic, social and environmental issues, as well as functions and industrial practices. This allows them to reflect on and evaluate present and past Design and Technology, its uses and its impacts.

Purpose of Study

'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.' (National Curriculum, 2014)

The EYFS

Design Technology comes under the Early Learning Goal 'Expressive Arts and Design'. Children are assessed against the Early Learning Goal at the end of Reception. Throughout their time in the foundation stage children are assessed against check points to ensure a progression of skills. Expressive arts and design involves enabling children to explore and play with a wide range of media and materials, as well as providing opportunities and encouragement for sharing their thoughts, ideas and feelings through a variety of activities in art, music, movement, dance, role-play, and design and technology.

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.

Framework for Teaching Design Technology

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, such as 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 such as 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, such as 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, such as 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, such as 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, such as gears, pulleys, cams, levers and linkages
- understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs, buzzers and motors
- apply their understanding of computing to programme, monitor and control their products.

The Curriculum

Design Technology should form part of a creative, cross-curricular curriculum. Links should be made, wherever possible, with other subject areas. Using the key skills and knowledge grid ensures coverage and progression, and completing a yearly gap analysis ensures all areas of the Design Technology curriculum are covered.

Essential Skills in Design Technology to be Developed.

ASPECT	KEY STAGE 1- MAKING, USING AND UNDERSTANDING STRAND	
	End of Year 1 Expectations	End of Year 2 Expectations
TOOLS	Select and explain why they have chosen a particular tool for a task.	Use tools safely for cutting and joining materials and components.
MATERIALS	Select and explain their choice of materials, sometimes with help.	Choose appropriate materials and suggest ways of manipulating them to achieve a desired effect.
HEALTH AND SAFETY	Explain how to keep safe during a practical task.	Work safely and hygienically in construction and cooking activities.
REPAIR AND MAINTENANCE	Explain how they would fix simple products.	Cut, measure, form and shape materials to fix or repair something, explaining objectives.
TEXTILES	Cut out shapes from a range of fabrics or papers.	Join fabrics using running stitch, glue, staples, over sewing and tape.
CARD MAKING	Fold, tear, roll and cut paper and card.	Create simple hinges and pop-ups using card.
CUTTING	Cut accurately and safely with scissors.	Cut wood/dowel using a bench hook and hacksaw.
JOINING	Joins appropriately, using glue or tape.	Attach features to a vehicle (e.g. an axel and wheels or a sail and rudder). Join appropriately, with glue and/or tape, for different materials and situations.
STRUCTURES	Build simple structures.	Improve structures by making them stronger, stiffer and more stable.
MECHANISMS	Use wheels, axels, levers and sliders.	Create and use wheels, axels, levers and sliders.
ELECTRICITY	Identify and talk about products that use electricity to make them work.	Create working circuits to light a bulb or work a buzzer.
ICT	Input random control instructions to simple devices for an unplanned outcome (e.g. Making Bee-Bot move)	Input a sequence of instructions into a device for a planned outcome.
PREPARING AND COOKING FOOD	Measure and weigh food items using non-standard measures (e.g. spoons and cups)	Cut, peel, grate and chop a range of ingredients to make dishes from other countries.
NUTRITION	Identify the main food groups including fruit and vegetables.	Recognise the need for a variety of foods in a diet.
ORIGINS OF FOOD	Identify the source of common food.	Explain where the food they eat comes from (e.g.by referring to countries, animals and plants).

ASPECT	KEY STAGE 1- Planning, Knowledge and Evaluation	
	End of Year 1 Expectations	End of Year 2 Expectations
DESIGNING	Draw a simple picture of a design with basic labelling	Produce detailed, labelled drawings or models of products based on design criteria.
USING ICT TO AID DESIGN	Use ICT packages to create a simple plan for a design.	Use ICT packages to create a labelled plan or design.
WORKING FROM PLANS	With help, put ideas into practise.	Think of ideas and plan what to do next, based on their experience of working with materials or components.
OPINION AND INFLUENCE	Describe others' work, including work by professional crafts people and designers and say what they like and dislike about it.	Describe similarities and differences between own and others' work including work by professional crafts people and designers.
EXISTING PRODUCT EVALUATION	Describe how an existing product works (e.g. the toy moves when I turn the handle).	Investigate a range of existing products and say if they do what they are supposed to do.
EVALUATION	Talk about their own and others' work identifying strengths or weaknesses.	Explain how closely, finished products, meet their design criteria and say what they could do better in the future.
HISTORY AND CULTURE	Order products or designs chronologically and begin to explain reasons why they are ordered in that way.	Explain why a design, building or designer is important.

ASPECT	LOWER KEY STAGE 2- MAKING, USING AND UNDERSTANDING STRAND	
	End of Year 3 Expectations	End of Year 4 Expectations
TOOLS	Select the appropriate tool and explain choices.	Analyse the potential of a range of tools and use them with accuracy.
MATERIALS	Plan which materials will be needed for a task and explain why.	Choose from a range of materials, showing an understanding of their different characteristics.
HEALTH AND SAFETY	Follow health and safety rules for cooking and baking activities.	Follow health and safety rules when working with materials and substances.
REPAIR AND MAINTENANCE	Try an alternative way for fixing something, if their first attempt isn't successful.	Describe how a product could be made better, stronger or more sustainable.
TEXTILES	Create a simple pattern for a design.	Use a simple pattern to create a life-sized item of clothing.
CARD MAKING	Cut slots in card and make nets.	Use more complex pop-ups.
CUTTING	Measure and mark wood and dowel.	Cut internal shapes.
JOINING	Join fabrics using running stitch.	Use a glue gun with close supervision (1:1).
STRUCTURES	Create a shell or frame structure using diagonal struts to strengthen.	Prototype and build frame and shell structures, showing awareness of how to strengthen, stiffen and reinforce.
MECHANISMS	Create and use simple gears, pulleys, cams, levers and linkages.	Use pulleys, levers and linkages in their products.
ELECTRICITY	Build models incorporating circuits, with bulbs and buzzers.	Build models incorporating motors.
ICT	Evaluate their own programme, refine and improve it.	Create a solution to a problem using a control output device that has a sequence of events to activate it.
PREPARING AND COOKING FOOD	Combine a variety of ingredients using a range of cooking techniques.	Measure and weigh ingredients appropriately to prepare and cook a range of savoury dishes.
NUTRITION	Describe what a balanced diet is.	Make healthy eating choices and explain why.
ORIGINS OF FOOD	Identify food that comes from the UK and other countries in the world.	Explain some of the processes that food goes through to preserve/make them more appealing.

ASPECT	LOWER KEY STAGE 2- Planning, Knowledge and Evaluation	
	End of Year 3 Expectations	End of Year 4 Expectations
DESIGNING	Share ideas through words, labelled sketches and models, recognising that designs have to meet a range of needs, including being fit for purpose.	Collect information from a number of different sources and use this information to inform design ideas in words, labelled sketches, diagrams and models, keeping in mind fitness for purpose and the end user.
USING ICT TO AID DESIGN	Use ICT packages to create a labelled design or plan, in detail.	Use ICT packages to create alternatives for an initial design.
WORKING FROM PLANS	Make realistic plans, identifying processes, equipment and materials needed.	Make realistic step by step plans, reflecting on designs as the product develops.
OPINION AND INFLUENCE	Compare and contrast great bridge designs, explaining why a particular design is significant in engineering history.	Describe the work of a favourite fashion designer and explain why they like his/her designs.
EXISTING PRODUCT EVALUATION	Investigate the design features (including identifying components or ingredients) of familiar existing products.	Explain how an existing product is useful to the user.
EVALUATION	Suggest improvements to products made and describe how to implement them (taking the views of others into account).	Identify what has worked well and what could be improved, evidencing and explaining the results of the research.
HISTORY AND CULTURE	Explain the impact of a design or designer on design history and how this has helped shape the world.	Explain how fashions and fabrics have changed over time and how this has affected fashion. Explain how the design of a product has changed over time.

ASPECT	UPPER KEY STAGE 2- MAKING, USING AND UNDERSTANDING STRAND	
	End of Year 5 Expectations	End of Year 6 Expectations
TOOLS	Name and select appropriate tools for a task and use them with precision.	Use more complex tools with increasing accuracy.
MATERIALS	Select and combine materials with precision.	Choose the best materials for a task, showing an understanding of their working characteristics.
HEALTH AND SAFETY	Select and name appropriate tools for specific jobs and demonstrate how to use them safely.	Demonstrate how their products take into account the safety of the user.
REPAIR AND MAINTENANCE	Recycle, repair and mend old clothes/tools and explain why this is a good idea.	Paint, glue, nail and sand to rejuvenate a damaged, faulty or old object.
TEXTILES	Create a 3D product using a range of materials and sewing techniques.	Combine fabrics to create more useful properties and make a product of high quality checking for snags and glitches.
CARD MAKING	Combine materials with temporary or fixed joints.	Combine materials with moving joints.
CUTTING	Cut safely and accurately to a marked line.	Use a craft knife, cutting mat and safety ruler with one to one supervision if needed.
JOINING	Use a glue gun with close supervision.	Join materials using the most appropriate method for the materials or purpose.
STRUCTURES	Build a framework using a range of materials (e.g. wood, card and corrugated plastic) to support mechanisms.	Select the most appropriate materials and frameworks for different structures, explaining what makes them strong.
MECHANISMS	Use cams or gears in their products.	Select the most appropriate mechanical system for a particular purpose.
ELECTRICITY	Build models incorporating switches to turn on and off.	Design products using the most appropriate electrical systems.
ICT	Monitor and control more than one output, in response to changes.	Develop, try out and refine sequences of instructions to effectively monitor, measure and control events.
PREPARING AND COOKING FOOD	Combine food ingredients appropriately (e.g. kneading, rubbing in and mixing).	Use appropriate tools and equipment, weighing and measuring with scales.
NUTRITION	Evaluate meals and consider if they contribute towards a balanced diet.	Plan how they can have an healthy/affordable diet.
ORIGINS OF FOOD	Explain what times of year particular foods are in season.	Explain how ingredients were grown, reared, caught and processed.

ASPECT	UPPER KEY STAGE 2- Planning, Knowledge and Evaluation	
	End of Year 5 Expectations	End of Year 6 Expectations
DESIGNING	Use various sources of information, clarifying/sharing ideas through discussions, labelled sketches, cross-sectional diagrams and modelling, recognising that ideas have to meet a range of needs.	Develop detailed criteria for designs for products aimed at particular individuals or groups, sharing ideas through cross-sectional and exploded diagrams, prototypes and pattern pieces.
USING ICT TO AID DESIGN	Use CAD and CAM packages to suggest alternative ideas and explain their ideas and intentions.	Use CAD and CAM packages to design moving parts of a design.
WORKING FROM PLANS	Work from own detailed plans, modifying them where appropriate.	Check work as it develops and modify their approach in light of progress.
OPINION AND INFLUENCE	Research the work done by textile artists and say what they like about a piece, identifying the techniques and materials used in creating it and the aesthetic value.	Research cultural traditions and evidence their influence in their own work.
EXISTING PRODUCT EVALUATION	Investigate the design features (including identifying components or ingredients) of a familiar existing product in the context of the culture or society in which it was designed or made.	Explain the form and function of familiar existing products.
EVALUATION	Test and evaluate products against a detailed design specification and make adaptations as they develop the product.	Demonstrate modifications made to a product, as a result of ongoing evaluation, by themselves and others.
HISTORY AND CULTURE	Explain the impact of a design or designer on design history and how this has helped shape the world.	Describe how an individual in the field of design and technology has helped shape the world.

Teaching and Learning Style

The school uses a variety of teaching and learning styles in Design and Technology lessons. The principal aim is to develop children's knowledge, skills and understanding in design and technology. Teachers ensure that the children apply their knowledge and understanding when developing ideas, planning and making products and then evaluating them. We do this through a mixture of whole-class teaching and individual/group activities. Within lessons, we give children the opportunity both to work on their own and to collaborate with others, listening to other children's ideas and treating these with respect. Children critically evaluate existing products, their own work and that of others. They have the opportunity to use a wide range of materials and resources, including ICT.

Equality and Inclusion

Errington Primary School aims to ensure that equality and inclusion are at the forefront of teaching and learning throughout the curriculum. This comes under the three broad headings of:

- Setting suitable learning challenges
- Responding to pupils diverse learning needs
- Overcoming potential barriers to learning and assessment for individuals and groups of pupils

A fully expanded explanation of these three principles can be found in the National curriculum document. More information can be found in the specific Errington Primary School Equality and Inclusion Policy.

Health and Safety

The safety of the children is the responsibility of the class teacher. The children are made aware of the safe use and correct procedure involved when using tools and equipment in a learning environment and how to follow proper procedures for food safety and hygiene.

The children are made aware of the need to be careful and to understand that their actions can affect others.

Children need to be taught how to

- use tools and equipment correctly
- recognise hazards and risk control

Children should be

- strictly supervised in their use of equipment at all times.
- taught to respect the equipment they are using and to keep it stored safely while not in use.
- taught to recognise and consider hazards and risks and to take action to control these risks, having followed simple instructions.

Food Hygiene

- Pupils and staff will take care to undertake appropriate hand washing and other hygiene related activities prior to preparing food.

Assessment

Formative assessment is used to guide the process of individual pupils in Design Technology. It involves identifying each child's progress, determining what each child has learnt and what should therefore be the next step in their learning. Formative assessment is mostly carried out informally by the teachers in the course of their teaching and should be based on the identified assessment opportunities.

Summative assessment will form part of the annual report to parents, informing them of their child's progress.

Photographs of children's work are a useful tool to keep, as a reminder of pupil's achievement.

Monitoring

The monitoring of coverage and progress across the school will be completed by the subject leader in consultation with teachers and the SLT.

Resourcing

A range of Design Technology resources are stored in the Resource Room. Staff are encouraged to check resourcing before they start a new topic so that consumables can be ordered if needed.