Northaw CE Primary School

The Northaw Curriculum

Design and technology

He has filled them with skill to do all kinds of work as engravers, designers, embroiderers in blue, purple and scarlet yarn and fine linen, and weavers – all of them skilled workers and designers.

Exodus 35:35
New International Version

At Northaw, we aim to follow the statutory national curriculum, guidance on relationships and health education, and framework for the early years foundation stage, and the Church of England statement of entitlement through The Northaw Curriculum, which comprises all learning and other experiences, the hidden curriculum, that we plan for our pupils. Programmes of study are enhanced by added value, learning sequences and progression frameworks.

At Northaw, we see pupils as discoverers, exploring subjects. The core subjects are English, mathematics and science. The other foundation subjects are art and design, computing, design and technology, languages (French), geography, history, music; personal, social, health and economic education (including relationships education), physical education and religious education. They build on the areas of learning and development in the early years foundation stage. The prime areas are communication and language, physical development, and personal, social and emotional development. The specific areas are literacy, mathematics, understanding the world, and expressive arts and design.

At Northaw, we are committed to providing an ambitious, inclusive, broad and balanced curriculum rooted in Christian values that endows every child with the knowledge and cultural capital, skills, understanding and vocabulary to fulfil their potential while nurturing well-being, and prepares them for citizenship, future learning and employment, and lifelong faith. Equally designed to meet the needs of pupils whose attainment is significantly above the expected standard, the particularly disadvantaged and those with SEND, our curriculum is demanding, setting suitable challenges and overcoming would-be barriers to achieve the best possible outcomes consistently for all. Building on our Christian vision, The Northaw Curriculum affords space for a deepening spiritual awareness, the development of moral attitudes and a strengthened sense of community. Coherently sequenced, our curriculum frees teachers to deliver clear, engaging lessons, adapted when necessary to address both gaps and misconceptions, and promote appropriate discussion in environments focused on pupils who produce high-quality work and are supported to retain content and acquire mastery. Phonics and reading are prioritised, allowing pupils to access the full education offer; opportunities to develop fluency in mathematics and English across the curriculum bolstered by enhanced learning powers (the 6Rs) lead to success in life. Integrated with our curriculum, daily acts of collective worship are occasions for personal reflection, communal growth and further exploration of life's big questions, sitting alongside academic progress.

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.

Added value

At Northaw, design and technology taps consciously into human dreams of a better world realised through collaboration. We follow Projects on a Page from the Design and Technology Association. Practice is at all times healthy, safe and hygienic. Our newly refurbished design hub is used for exhibiting artworks and projects, inspiring creativity, and storing materials and tools. Pupils understand how design and technology differs from art and design.

Aims

The Northaw 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.

Early years foundation stage – nursery and reception

Expressive arts and design

Creating with materials

Children at the expected level of development will:

- 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
- make use of props and materials when role playing characters in narratives and stories.

Children in nursery will be learning to:	Examples of how we support this:
Explore different materials freely, 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. Join different materials and explore different textures.	Offer opportunities to explore scale. Suggestions: • long strips of wallpaper • child size boxes • different surfaces to work on e.g., paving, floor, tabletop or easel Listen and understand what children want to create before offering suggestions. Invite artists, musicians and craftspeople into the setting, to widen the range of ideas which children can draw on. Suggestions: glue and masking tape for sticking pieces of scrap materials onto old cardboard boxes, hammers and nails, glue guns, paperclips and fasteners.
Create closed shapes with continuous lines and begin to use these shapes to represent objects. Draw with increasing complexity and detail, such as representing a face with a circle and including details. Use drawing to represent ideas like movement or loud noises. Show different emotions in their drawings and paintings, like happiness, sadness, fear, etc. Explore colour and colour mixing. Show different emotions in their drawings – happiness, sadness, fear, etc.	Help children to develop their drawing and modelmaking. Encourage them to develop their own creative ideas. Spend sustained time alongside them. Show interest in the meanings children give to their drawings and models. Talk together about these meanings. Encourage children to draw from their imagination and observation. Help children to add details to their drawings by selecting interesting objects to draw, and by pointing out key features to children and discussing them. Talk to children about the differences between colours. Help them to explore and

	refine their colour mixing – for example: "How does blue become green?" Introduce children to the work of artists from across times and cultures. Help them to notice where features of artists' work overlap with the children's, for example in details, colour, movement or line.

Children in reception will be learning to:	Examples of how we support this:
Explore, use and refine a variety of artistic effects to express their ideas and feelings. Return to and build on their previous learning, refining ideas and developing their ability to represent them. Create collaboratively, sharing ideas, resources and skills.	Teach children to develop their colour-mixing techniques to enable them to match the colours they see and want to represent, with step-by-step guidance when appropriate. Provide opportunities to work together to develop and realise creative ideas. Provide children with a range of materials for children to construct with. Encourage them to think about and discuss what they want to make. Discuss problems and how they might be solved as they arise. Reflect with children on how they have achieved their aims. Teach children different techniques for joining materials, such as how to use adhesive tape and different sorts of glue. Provide a range of materials and tools and teach children to use them with care and precision. Promote independence, taking care not to introduce too many new things at once. Encourage children to notice features in the natural world. Help them to define colours, shapes, texture and smells in their own words. Discuss children's responses to what they see. Visit galleries and museums to generate inspiration and conversation about art and artists.

In the early years foundation stage, design and technology is not taught discreetly but through following children's interests, planned topics, and curriculum ambitions linked to activity zones and unpacked as core skills. Progress is logged on Tapestry.

Early years foundation stage planned topics

	Autumn	Spring	Summer
Year A	All about me Harvest Diwali Christmas	Growing Lunar New Year Shrove Tuesday Easter	Once upon a time Bear topic When I grow up Be active week
Year B	Welcome to Acorns Harvest Under the sea Christmas	Spring We are scientists Shrove Tuesday Easter	Tell me a story Express yourself Moving on Be active week

Early years foundation stage curriculum ambitions

Activity zones	Curriculum ambitions	Core skills
Creative area	Collaborate with a friend to make something from reclaimed materials Independently paint a picture using watercolour and poster paints	• To be able to cut accurately using scissors • To be able to select and use the most appropriate type of glue • To be able to use a range of joining techniques • To be able to effectively use watercolour and poster paints independently • To make choices independently
Role play/small world	Use imagination to re-enact familiar and unfamiliar roles and experiences	• To be able to develop and extend a narrative • To be able to engage with purposeful symbolic play • To use familiar vocabulary
Sand/water	Create imaginative and intricate structures using an understanding of properties of sand and water	• To be able to grasp, hold and carry containers • To be able to manipulate sand creatively • To be able to move water successfully from one place to another • To know that the texture of sand changes when water is added
Construction	Build an intricate, stable model with friends or independently	• To be able to select and use a range of fixing and joining materials • To seek help from peers

		• To talk about what they are doing and give instructions
Malleable	Use Play-Doh to plan and make a model of something in which you are interested	• To be able to manipulate Play-Doh skilfully • Knows how to select and use different tools to make marks and help manipulate the Play-Doh
Music and dance	Enjoy creating musical and dramatic performances	• To know some rhymes and songs • To be able to move rhythmically • To be able to use their imagination • To know about places performances take place
Physical	Ride a two-wheeled bike safely and confidently Move confidently across the A-frame/trapeze/monkey bars/climbing frame/tree	• To hold own body weight • To have strong core balance • To have good spatial awareness • To understand about the safety of others
Cooking	Follow a recipe to make a cake	• To know that text and images convey meaning • To be able to coordinate hand-eye and fine motor skills to mix and pour • To be able to select the right utensils

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 – years 1 and 2

Key stage 1 programme of study

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.

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:

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

Key stage 1 learning sequence

	Autumn 1	Spring 1	Summer 1
Year A	Mechanisms – Sliders and levers	Structures – Freestanding structures	Food – Preparing fruit and vegetables
Year B	Mechanisms – Wheels and axles	Textiles – Templates and joining techniques	Food – Preparing fruit and vegetables

Design and technology is taught each term in rotation with art and design. It is timetabled for at least 45 minutes every week; however, units sometimes lend themselves to completion over the course of a day. Projects, inspired by DT masters, are recorded both on a double-sided A3 page (displayed collectively) and Seesaw. Summative assessment is completed at the end of each year with pupils categorised as either working below the expected standard (PRE), working towards the expected standard (WTS), working at the expected standard (EXS) or working at greater depth within the expected standard (GDS) for their year group.

Key stage 2 – years 3 to 6

Key stage 2 programme of study

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:

- 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.

Lower key stage 2 learning sequence

	Autumn 1	Spring 1	Summer 1
Year A	Structures – Shell structures using computer-aided design (CAD)	Food – Healthy and varied diet	Mechanical systems – Pneumatics
Year B	Textiles – 2-D shape to 3-D product	Food – Healthy and varied diet	Electrical systems – Simple programming and control

Design and technology is taught each term in rotation with art and design. It is timetabled for at least 45 minutes every week; however, units sometimes lend themselves to completion over the course of a day. Projects, inspired by DT masters, are recorded on a double-sided A3 page (displayed collectively). Summative assessment is completed at the end of each year with pupils categorised as either working below the expected standard (PRE), working towards the expected standard (WTS), working at the expected standard (EXS) or working at greater depth within the expected standard (GDS) for their year group.

Upper key stage 2 learning sequence

	Autumn 1	Spring 1	Summer 1
Year A	Food – Celebrating culture and seasonality	Structures – Frame structures	Electrical systems – Monitoring and control
Year B	Mechanical systems – Cams	Textiles – Using computer-aided design (CAD) in textiles	Food – Celebrating culture and seasonality

Design and technology is taught each term in rotation with art and design. It is timetabled for at least 45 minutes every week; however, units sometimes lend themselves to completion over the course of a day. Projects, inspired by DT masters, are recorded on a double-sided A3 page (displayed collectively). Summative assessment is completed at the end of each

year with pupils categorised as either working below the expected standard (PRE), working towards the expected standard (WTS), working at the expected standard (EXS) or working at greater depth within the expected standard (GDS) for their year group.

Key stages 1 and 2 progression framework

Designing	Key Stage 1	Key Stage 2
Understanding contexts, users and purposes	Across KS1 pupils should: • work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment • state what products they are designing and making • say whether their products are for themselves or other users • describe what their products are for • say how their products will work • say how they will make their products suitable for their intended users • use simple design criteria to help develop their ideas	Across KS2 pupils should: • work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment • describe the purpose of their products • indicate the design features of their products that will appeal to intended users • explain how particular parts of their products work In early KS2 pupils should also: • gather information about the needs and wants of particular individuals and groups • develop their own design criteria and use these to inform their ideas In late KS2 pupils should also: • carry out research, using surveys, interviews, questionnaires and web-based resources • identify the needs, wants, preferences and values of particular individuals and groups • *develop a simple design specification to guide their thinking*
Generating, developing, modelling and communicating ideas	Across KS1 pupils should: • generate ideas by drawing on their own experiences • use knowledge of existing products to help come up with ideas • develop and communicate ideas by talking and drawing • model ideas by exploring materials, components and construction kits and by making templates and mock-ups • use information and communication technology, where appropriate, to develop and communicate their ideas	Across KS2 pupils should: • share and clarify ideas through discussion • model their ideas using prototypes and pattern pieces • use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas • use computer-aided design to develop and communicate their ideas In early KS2 pupils should also: • generate realistic ideas, focusing on the needs of the user • *make design decisions that take account of the availability of resources* In late KS2 pupils should also: • generate innovative ideas, drawing on research • *make design decisions, taking account of constraints such as time, resources and cost*
Making	**Key Stage 1**	**Key Stage 2**
Planning	Across KS1 pupils should: • *plan by suggesting what to do next* • select from a range of tools and equipment, *explaining their choices* • select from a range of materials and components according to their characteristics	Across KS2 pupils should: • select tools and equipment suitable for the task • *explain their choice of tools and equipment in relation to the skills and techniques they will be using* • select materials and components suitable for the task • explain their choice of materials and components according to functional properties and aesthetic qualities In early KS2 pupils should also: • *order the main stages of making* In late KS2 pupils should also: • *produce appropriate lists of tools, equipment and materials that they need* • *formulate step-by-step plans as a guide to making*
Practical skills and techniques	Across KS1 pupils should: • follow procedures for safety and hygiene • use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components • measure, mark out, cut and shape materials and components • assemble, join and combine materials and components • use finishing techniques, including those from art and design	Across KS2 pupils should: • follow procedures for safety and hygiene • use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components In early KS2 pupils should also: • measure, mark out, cut and shape materials and components with some accuracy • assemble, join and combine materials and components with some accuracy • apply a range of finishing techniques, including those from art and design, with some accuracy In late KS2 pupils should also: • accurately measure, mark out, cut and shape materials and components • accurately assemble, join and combine materials and components • accurately apply a range of finishing techniques, including those from art and design • *use techniques that involve a number of steps* • demonstrate resourcefulness when tackling practical problems

statements which are additional to the programmes of study

Key stages 1 and 2 progression framework

Evaluating	Key Stage 1	Key Stage 2
Own ideas and products	Across KS1 pupils should: • talk about their design ideas and what they are making • make simple judgements about their products and ideas against design criteria • *suggest how their products could be improved*	Across KS2 pupils should: • identify the strengths and areas for development in their ideas and products • consider the views of others, including intended users, to improve their work In early KS2 pupils should also: • refer to their design criteria as they design and make • use their design criteria to evaluate their completed products In late KS2 pupils should also: • critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make • *evaluate their ideas and products against their original design specification*
Existing products	Across KS1 pupils should explore: • what products are • who products are for • what products are for • how products work • how products are used • where products might be used • what materials products are made from • what they like and dislike about products	Across KS2 pupils should investigate and analyse: • how well products have been designed • how well products have been made • why materials have been chosen • what methods of construction have been used • how well products work • how well products achieve their purposes • how well products meet user needs and wants In early KS2 pupils should also investigate and analyse: • who designed and made the products • where products were designed and made • when products were designed and made • whether products can be recycled or reused In late KS2 pupils should also investigate and analyse: • how much products cost to make • how innovative products are • how sustainable the materials in products are • what impact products have beyond their intended purpose
Key events and individuals	Not a requirement in KS1	Across KS2 pupils should know: • about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products
Technical knowledge	**Key Stage 1**	**Key Stage 2**
Making products work	Across KS1 pupils should know: • about the simple working characteristics of materials and components • about the movement of simple mechanisms such as levers, sliders, wheels and axles • how freestanding structures can be made stronger, stiffer and more stable • *that a 3-D textiles product can be assembled from two identical fabric shapes* • *that food ingredients should be combined according to their sensory characteristics* • *the correct technical vocabulary for the projects they are undertaking*	Across KS2 pupils should know: • how to use learning from science to help design and make products that work • how to use learning from mathematics to help design and make products that work • that materials have both functional properties and aesthetic qualities • *that materials can be combined and mixed to create more useful characteristics* • that mechanical and electrical systems have an input, process and output • *the correct technical vocabulary for the projects they are undertaking* In early KS2 pupils should also know: • how mechanical systems such as levers and linkages or pneumatic systems create movement • how simple electrical circuits and components can be used to create functional products • how to program a computer to control their products • how to make strong, stiff shell structures • *that a single fabric shape can be used to make a 3D textiles product* • *that food ingredients can be fresh, pre-cooked and processed* In late KS2 pupils should also know: • how mechanical systems such as cams or pulleys or gears create movement • how more complex electrical circuits and components can be used to create functional products • how to program a computer to monitor changes in the environment and control their products • how to reinforce and strengthen a 3D framework • *that a 3D textiles product can be made from a combination of fabric shapes* • *that a recipe can be adapted by adding or substituting one or more ingredients*
Cooking and nutrition	**Key Stage 1**	**Key Stage 2**
Where food comes from	Across KS1 pupils should know: • that all food comes from plants or animals • that food has to be farmed, grown elsewhere (e.g. home) or caught	Across KS2 pupils should know: • that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world In late KS2 pupils should also know: • that seasons may affect the food available • how food is processed into ingredients that can be eaten or used in cooking
Food preparation, cooking and nutrition	Across KS1 pupils should know: • how to name and sort foods into the five groups in The eatwell plate • that everyone should eat at least five portions of fruit and vegetables every day • how to prepare simple dishes safely and hygienically, without using a heat source • how to use techniques such as cutting, peeling and grating	Across KS2 pupils should know: • how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source • how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking In early KS2 pupils should also know: • that a healthy diet is made up from a variety and balance of different food and drink, as depicted in The eatwell plate • that to be active and healthy, food and drink are needed to provide energy for the body In late KS2 pupils should also know: • *that recipes can be adapted to change the appearance, taste, texture and aroma* • that different food and drink contain different substances – nutrients, water and fibre – that are needed for health

statements which are additional to the programmes of study