

Eastbrook Primary Design & Technology Curriculum



Intent: A Character and Academics approach

At Eastbrook Primary School, design and technology is fully inclusive to every child. Our aims are to: fulfil the requirements of the National Curriculum for design and technology, provide a broad and balanced curriculum, ensure the progressive development of knowledge and skills, to learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens through evaluation of past and present design and technology, develop a critical understanding of its impact on daily life and the wider world, to participate successfully in an increasingly technological world using the language of design and technology.

The aims of teaching design and technology in our school are to:

- Develop creative, technical and imaginative thinking in children and to develop confidence to participate successfully in an increasingly technological world.
- Enable children to talk about how things work and to develop their technical knowledge,
- Apply a growing body of knowledge, understanding and skills in order to design and make prototypes and products for a wide range of users,
- Encourage children to select appropriate tools and techniques when making a product, whilst following safe procedures,
- Develop an understanding of technological processes and products, their manufacture and their contribution to our society,
- Foster enjoyment, satisfaction and purpose in designing and making things,
- Critique, evaluate and test their ideas and products, and the work of others,
- Understand and apply the principles of nutrition and to learn how to cook,
- Understand how key events and individuals have helped shape the world through design and technology.

End Point (Key Stage 4)

The teaching of design and technology at Eastbrook develops subject knowledge and skills within the wider school 'Character and Academics' approach to curriculum. Throughout their education, pupils receive a design and technology curriculum which allows them to exercise their creativity through designing and making.

Children are taught to combine their designing and making skills with knowledge and understanding in order to design and make a product. Skills are taught progressively to ensure that all children are able to learn and practice in order to develop as they move through the school. Evaluation is an integral part of an iterative design process and allows students to adapt and improve their products; this is a key skill which they need throughout their life. D&T allows pupils to apply the knowledge and skills learned in other subjects, particularly Maths, Science and Art. Children's interests are captured through theme learning, ensuring that links are made in a cross curricular way, giving students motivation and meaning to their learning.

Students are taught to understand that they must design and make with consideration of the impact of their work on the environment and society. We aim to produce students who design and make products in an innovative and socially responsible way.

Way Points

By the end of Early Years

Though multiple areas of learning, pupils begin to explore different materials. They gain an understanding of their properties and how they can be used. They are given opportunities to investigate a variety of everyday objects around them and discover how they work and move. The pupils start developing their own sense of design with junk modelling projects and a wide selection of construction resources. In the Summer term the children start building their understanding of technology and the role of ICT in design.

By the end of Key Stage 1

During Key Stage 1, pupils learn how to think imaginatively and talk about what they like and dislike when designing and making. They build on their early childhood experiences of investigating objects around them. They explore how familiar things work and talk about, draw and model their ideas. They learn how to design and construct objects safely and may use ICT as part of this process.

By the end of Key Stage 2

During Key Stage 2, pupils work on their own and as part of a team at a range of designing and making activities. They think about what products are used for and the needs of the people who use them. They plan what has to be done and identify what works well and what could be improved in their own and other people's designs. They draw on knowledge and understanding from other areas of the curriculum and use computers, software (such as SketchUp and Scratch) and hardware (digital microscopes/ data-logging packages) in a range of ways in order to develop their ideas.

Teaching will ensure that the specific expectations of 'knowledge and understanding' are applied when 'developing ideas', 'planning', 'making products' and 'evaluating' them.

Appendices A, B & C show the planned end points for each year group from 1 to 6, broken into IPC Milestones.

Sequencing

The curriculum we have developed is planned and sequenced in a way which is best represented by an ascending spiral. At each point of incline, new knowledge and skills are built upon the previous knowledge and skills taught. All of this is with our planned end points in

mind. Our curriculum is joined-up and progressive and not only builds upon what has come before for the children but for what is to come next.

The units selected as part of the route plan from IPC reflect this well. As evidenced within appendix A, objectives are covered comprehensively throughout the mileposts with most included within both years of study.

For example, **evaluating** is introduced in Year 1 (1.01 Know that products in everyday use have an effect on people's lives) and can be traced through to the final topic in Year 6 (3.01 Know that technology affects people's lives). The same applies to **designing** where Year 1 are required to be able to plan what they are going to make (1.01) and by Year 6 pupils must be able to respond to identified needs, wants and opportunities with informed designs and products (3.04).

Adaptation

Our curriculum reflects the school's local context by addressing typical gaps in pupils' knowledge and skills. The most significant factors impacting on pupils' knowledge and skills with regard to our local context are:

- The number of pupils in school with English as an Additional Language (EAL).
- The number of pupils in school with Speech, Language and Communication needs (SLC).
- The number of pupils in school with Social Emotional and Mental Health needs (SEMH).
- The high level of economic deprivation amongst pupils.
- The variation in cultural experience amongst pupils.

We are addressing these needs in the following ways:

- By ensuring, wherever practicably possible, we link the IPC topics and the high-quality texts being studied in English. Through this approach, our pupils gain greater exposure to geographical content and associated vocabulary.
- Teachers ensure that lessons are practical and engaging. This could be done in many ways including role play, educational visits, using multi-media (including Now>Press>Play technology), guest speakers.
- To enhance Cultural Capital in design and technology at Eastbrook we teach about famous architects and engineers such as Brunel, Robert Stephenson and Zaha Hadid

Children will also experience the following:

- Meeting and talking to design and technology specialists including secondary teachers and University professors.
- Fieldwork to a place of local interest
- Use of computer software to research and design
- Gain an understanding from a business leader regarding the importance of learning about design and technology

Transferable skills and knowledge

Within our geography curriculum we aim to inspire in pupils the **character virtues** of creativity, perseverance, teamwork, appreciation, curiosity and fascination about the world and its people that will remain with them for the rest of their lives.

Examples of discussing skills and knowledge are listed below.

Knowledge/Skill	Curricular Link
Strength in structures	Maths- geometry, measurements
Pneumatics	Science
Making measurements and using equipment	Maths- measuring, data handling
Planning, explanation and evaluation	English- writing & speaking and listening
Undertaking and representing research	English- Reading Computing- Using search engines & word processing and presentational software
Evaluating the needs of communities	Geography- Locating countries on maps
Expression of views & debate	English- speaking & listening
Design and technology through time	History
Applying finishing techniques	Art and design

Appendix A – Milepost 1 (Years 1 & 2) End Points

DT Progression Model 2019-20

KS1

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

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

	Knowledge	Skills	Vocabulary
1	<p><u>Designing</u></p> <ul style="list-style-type: none"> • State what products they are designing and making • Say whether their product is for themselves or other users • Describe what their products are for <p><u>Making</u></p> <ul style="list-style-type: none"> • Plan by suggesting what to do next • Select from a range of simple tools and equipment • Know about the simple working characteristics of materials and components <p><u>Evaluating</u></p> <ul style="list-style-type: none"> • Talk about their design ideas and say what they are making <p><u>Cooking and Nutrition</u></p> <ul style="list-style-type: none"> • That food comes from plants and animals • How to name and sort foods into the five groups from the Eatwell Plate • That everyone should eat at least five portions of fruit and veg every day 	<p><u>Designing</u></p> <ul style="list-style-type: none"> • Use simple design criteria to help develop their ideas <p><u>Making</u></p> <ul style="list-style-type: none"> • Follow procedures for safety and hygiene • Use a range of materials and components including construction kits and materials, textiles, food ingredients and mechanical components • Assemble, join and combine materials and components <p><u>Evaluating</u></p> <ul style="list-style-type: none"> • Make simple judgements about their design and ideas against design criteria <p><u>Cooking and Nutrition</u></p> <ul style="list-style-type: none"> • How to prepare simple dishes safely and hygienically without using a heat source 	<ul style="list-style-type: none"> • Design • Product • Idea • Names of different materials & textiles • Names of different food ingredients • Assemble, join & combine • Food plant names • Animals that produce/give food • Eatwell Plate – fruit and vegetables. potatoes, bread, rice, pasta and other starchy carbohydrates. beans, pulses, fish, eggs, meat and other proteins. dairy and alternatives. oils and spreads. • Hygiene/hygienically

2	<p><u>Designing</u></p> <ul style="list-style-type: none"> • State what products they are designing and making • Say how their product will work • Say how they will make their product suitable for the intended user • Use knowledge of existing products to help come up with ideas <p><u>Making</u></p> <ul style="list-style-type: none"> • Talk about their design ideas and say what they are making • Select from a range of materials and components according to their characteristics • Know about the simple working characteristics of materials and components • Know about the movement of simple mechanisms such as levers, sliders, wheels and axles • Know how freestanding structures can be made stronger, stiffer and more stable <p><u>Evaluating</u></p>	<p><u>Designing</u></p> <ul style="list-style-type: none"> • Model ideas by exploring materials, components and construction kits by making templates and mock-ups. • Use simple design criteria to help develop their ideas • Explore what they what they like and dislike about products • Use ICT where appropriate to develop and communicate their ideas <p><u>Making</u></p> <ul style="list-style-type: none"> • Follow procedures for safety and hygiene • Use a range of materials and components including construction kits and materials, 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 <p><u>Evaluating</u></p>	<p>As above plus</p> <ul style="list-style-type: none"> • Intended user • Measure, mark out • Finishing techniques • Names of tools for cutting, peeling and grating purposes • Farm produce/home produce • Slider, lever, wheel and axel
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	<ul style="list-style-type: none"> • Talk about their design ideas and say what they are making • Explore a range of products and ask questions such as - What the products are? Who the products are for? How the products work? How the products are used? Where the products might be used? What materials the products are made from? What they like and dislike about the products? <p><u>Cooking and Nutrition</u></p> <ul style="list-style-type: none"> • That food comes from plants and animals • That food has to be farmed and grown elsewhere (e.g. home) or caught 	<ul style="list-style-type: none"> • Make simple judgements about their design and ideas against design criteria <p><u>Cooking and Nutrition</u></p> <ul style="list-style-type: none"> • How to prepare simple dishes safely and hygienically without using a heat source • How to use techniques such as cutting, peeling and grating. 	
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Appendix B – Milepost 2 (Years 3 & 4) End Points

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

- 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.

	Knowledge	Skills	Vocabulary
3	<p><u>Designing</u></p> <ul style="list-style-type: none"> • To know the purpose of their products • To know design features of their products that will appeal to intended users • To know how particular parts of their products work • To know the purpose and benefits of using a prototype or pattern piece • To know how to annotate a sketch effectively <p><u>Making</u></p> <ul style="list-style-type: none"> • To know that products are made of different components • To know procedures for safety and hygiene • To know how mechanical systems such as levers and linkages or pneumatic systems create movement <p><u>Evaluating</u></p> <ul style="list-style-type: none"> • To know: How well products have been designed How well products have been made Why materials have been chosen 	<p><u>Designing</u></p> <ul style="list-style-type: none"> • 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 • Use given information to develop their own design criteria and use these to inform their ideas (at least once per year) • Share and clarify ideas through discussion • Model their ideas using prototypes and pattern pieces (at least once per year) • Use annotated sketches, to develop and communicate their ideas <p><u>Making</u></p> <ul style="list-style-type: none"> • Select tools and equipment suitable for the task • Select materials and components suitable for the task • Follow procedures for safety and hygiene 	<p>As in previous years plus</p> <p>Purpose Design features Intended users Prototype Pattern piece Annotated sketches Design criteria Components Levers and linkages Pneumatic systems Movement Healthy diet Savoury</p>

	<p>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</p> <ul style="list-style-type: none"> • To know about inventors, designers, engineers, chefs, manufacturers and key events who have developed ground-breaking products and helped shaped the world. <p><u>Cooking and Nutrition</u></p> <ul style="list-style-type: none"> • To know that food is grown in the UK, Europe and wider world • To know that a healthy diet is made up from a variety and balance of different food and drink 	<ul style="list-style-type: none"> • Use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components • 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 • To use mechanical systems such as levers and linkages or pneumatic systems create movement • To make strong, stiff shell structures <p><u>Evaluating</u></p> <ul style="list-style-type: none"> • Identify the strengths and areas for development in their ideas and products • To investigate and analyse: who designed and made the products where products were designed and made 	
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		<p><u>Cooking and Nutrition</u></p> <ul style="list-style-type: none"> • To prepare and cook a variety of predominantly savoury dishes safely and hygienically • To use a range of techniques such as chopping, mixing, spreading. 	
4	<p><u>Designing</u></p> <ul style="list-style-type: none"> • To know the purpose of their products • To know design features of their products that will appeal to intended users • To know how particular parts of their products work • To know what information is needed to create their own design criteria • To know how to complete a cross-sectional drawing effectively <p><u>Making</u></p> <ul style="list-style-type: none"> • To know that products are made of different components • To know procedures for safety and hygiene • To know how cams or pulleys or gears work <p><u>Evaluating</u></p> <ul style="list-style-type: none"> • To know: 	<p><u>Designing</u></p> <ul style="list-style-type: none"> • 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 • Gather information about the needs and wants of particular individuals and groups to create their own design criteria (at least once per year) • Share and clarify ideas through discussion • Model their ideas using prototypes and pattern pieces (at least once per year) • Use annotated sketches or cross-sectional drawings, to develop and communicate their ideas 	<p>As above plus</p> <p>Cross-sectional drawing</p> <p>Cams, pulleys, gears</p> <p>Recycled</p> <p>Reused</p>

	<p>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</p> <ul style="list-style-type: none"> • To know about inventors, designers, engineers, chefs, manufacturers and key events who have developed ground-breaking products and helped shaped the world. <p><u>Cooking and Nutrition</u></p> <ul style="list-style-type: none"> • To know that food is reared and caught in the UK, Europe and wider world • To know that to be active and healthy, food and drink are needed to provide energy for the body 	<p><u>Making</u></p> <ul style="list-style-type: none"> • Select tools and equipment suitable for the task • Select materials and components suitable for the task • 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 • Measure, mark out, cut and shape materials and components with increasing accuracy • Assemble, join and combine materials and components with increasing accuracy • Apply a range of finishing techniques, including those from art and design, with increasing accuracy • To use mechanical systems such as cams or pulleys or gears create movement <p><u>Evaluating</u></p> <ul style="list-style-type: none"> • Use their design criteria to evaluate their completed products • To investigate and analyse: 	
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		<p>When products were designed and made Whether products can be recycled or reused</p> <p><u>Cooking and Nutrition</u></p> <ul style="list-style-type: none">• To prepare and cook a variety of predominantly savoury dishes safely and hygienically• To use a range of techniques as previously taught and to develop new skills of slicing and grating	
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Appendix C – Milepost 3 (Years 5 & 6) End Points

<p>5</p>	<p><u>Designing</u></p> <ul style="list-style-type: none"> • To know the purpose of their products • To know design features of their products that will appeal to intended users • To know how particular parts of their products work • To know how to design an appropriate questionnaire • To know how to complete an exploded diagram <p><u>Making</u></p> <ul style="list-style-type: none"> • To know that products are made of specific components • To know procedures for safety and hygiene • To know how electrical circuits work • To know how to programme a product <p><u>Evaluating</u></p> <ul style="list-style-type: none"> • To know: How well products have been designed How well products have been made 	<p><u>Designing</u></p> <ul style="list-style-type: none"> • 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 • Carry out research using questionnaires to identify the needs, wants, preferences or values of a particular individual/group (at least once per year) • Share and clarify ideas through discussion • Model their ideas using prototypes and pattern pieces (at least once per year) • Use annotated sketches or exploded diagrams to develop and communicate their ideas <p><u>Making</u></p> <ul style="list-style-type: none"> • Select tools and equipment suitable for the task and explain their choice of tools and equipment in relation to 	<p>As above plus Questionnaire Exploded diagram Electrical circuits Programming Reinforce and strengthen Food availability</p>
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	<p>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</p> <ul style="list-style-type: none"> • To know about inventors, designers, engineers, chefs, manufacturers and key events who have developed ground-breaking products and helped shaped the world. <p><u>Cooking and Nutrition</u></p> <ul style="list-style-type: none"> • To know that seasons affect food availability • To know that recipes can be adapted to change the appearance, taste, texture and aroma 	<p>the skills and techniques they will be using</p> <ul style="list-style-type: none"> • Select materials and components suitable for the task and explain their choice of materials and components according to functional properties and aesthetic qualities • Follow procedures for safety and hygiene • Use a wider range of materials and components than LKS2, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components • 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 • To use techniques that involve a number of steps • To reinforce and strengthen a 3D framework • To use simple electrical circuits and components can be used to create functional products 	
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		<ul style="list-style-type: none"> To program a computer to control their products <p><u>Evaluating</u></p> <ul style="list-style-type: none"> Consider the views of others, including intended users, to improve their work To investigate and analyse: how much products cost to make how innovative products are <p><u>Cooking and Nutrition</u></p> <ul style="list-style-type: none"> To prepare and cook a variety of predominantly savoury dishes safely and hygienically using the use of a heat source To use a range of techniques as previously taught and to develop new skill of peeling 	
6	<p><u>Designing</u></p> <ul style="list-style-type: none"> To know the purpose of their products To know design features of their products that will appeal to intended users To know how particular parts of their products work To know how to design appropriate interview questions 	<p><u>Designing</u></p> <ul style="list-style-type: none"> 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 Carry out research using interviews to identify the needs, wants, preferences or values of a particular 	<p>As above plus</p> <p>Interview</p> <p>Computer aided programmes</p> <p>Complex electrical circuits</p> <p>Food processing</p>

	<ul style="list-style-type: none"> • To know how to use computer aided programmes in the design process <p><u>Making</u></p> <ul style="list-style-type: none"> • To know that products are made of specific components • To know procedures for safety and hygiene • To know how complex electrical circuits work • To know how to programme to monitor and control their products <p><u>Evaluating</u></p> <ul style="list-style-type: none"> • To know: 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 • To know about inventors, designers, engineers, chefs, manufacturers and key events who have developed ground-breaking products and helped shaped the world. 	<p>individual/group (at least once per year)</p> <ul style="list-style-type: none"> • Share and clarify ideas through discussion • Model their ideas using prototypes and pattern pieces (at least once per year) • Use annotated sketches or computer-aided design to develop and communicate their ideas <p><u>Making</u></p> <ul style="list-style-type: none"> • Select tools and equipment suitable for the task and 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 and explain their choice of materials and components according to functional properties and aesthetic qualities • Follow procedures for safety and hygiene • Use a wider range of materials and components than LKS2, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components 	
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	<p><u>Cooking and Nutrition</u></p> <ul style="list-style-type: none"> • To know how food is processed into ingredients that can be eaten or used in cooking • To know that different food and drink contain different substances: nutrients, water and fibre, that are needed for health 	<ul style="list-style-type: none"> • 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 • Demonstrate resourcefulness when tackling practical problems • How more complex electrical circuits and components can be used to create functional products • How to program a computer to monitor and control their products <p><u>Evaluating</u></p> <ul style="list-style-type: none"> • Critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make • To investigate and analyse: how sustainable the materials in products are what impact products have beyond their intended purpose <p><u>Cooking and Nutrition</u></p> <ul style="list-style-type: none"> • To prepare and cook a variety of predominantly savoury dishes safely 	
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		<p>and hygienically using the use of a heat source</p> <ul style="list-style-type: none">• To use a range of techniques as previously taught and to develop new skills of kneading and baking	
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