

Crich Junior School



Design Technology

Our curriculum is designed using and extending the National Curriculum and conforms to the Equality Act and SEND regulations 2014, which ensures accessibility and inclusion to all children.

At Crich Junior School, our curriculum is designed to build on children's prior learning, provide meaningful and memorable learning experiences where our children are taught to be independent, confident and resilient learners.

Our curriculum has been designed to ensure that all children leave us with a wide body of knowledge, and the skills needed to be successful, lifelong learners with a real curiosity about the world around them.

The curriculum encompasses all the planned learning that is sequenced to promote learning, personal growth and development. Whilst fully including all statutory elements of the National Curriculum, our curriculum also gives our children the chance to explore a variety of additional 'enrichment' experiences, learning and opportunities to ensure all our children thrive and find their passion.

Our children are at the heart of every aspect of our curriculum. Developing the children's ability to learn more, know more and remember more is underpinned by quality first teaching of a broad body of knowledge and vocabulary. We provide engaging opportunities where children are immersed in independent problem solving techniques. We are committed to developing the whole child. Children have a strong awareness of their local community, their role within it and the value they bring to it. Children leave our school with a sense of belonging to an inclusive tightly-knit community where they have the confidence, knowledge and skills to make decisions, self-evaluate, and feel valued.

Our curriculum is based on the following key principles:

- A clear, shared vision of the knowledge and skills our children need to take advantage of future opportunities, responsibilities and experiences of later life.
- Commitment to a rich, varied, academic, practical problem-solving curriculum experience, which is inclusive for all our children.
- A curriculum that reflects the needs of the local community context.
- Planning and sequencing. Knowledge builds on previous learning.

Our Unique Intent:

- Practical Problem Solving rich curriculum
- Bushcraft, gardening, cookery, STEM technologies, local community projects etc
- Develop self worth
- Timetable designed to enable creative curriculum.

I want to be:

**an independent
learner**

resilient

**respectful and
tolerant**

**knowledgeable
and curious**

happy

confident

a team player

creative

**healthy and
active**

kind

**a problem
solver**



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 needs and the needs of others. They acquire a broad range of subject knowledge and draw on disciplines such as maths, science, engineering, computing, textiles, art and cookery. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable. 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.

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, as well as the work of others
- Understand and apply the principles of nutrition and learn how to cook

Design and technology will engage the children in a broad range of designing and making activities, which involve a variety of methods of communication: speaking, designing, drawing, assembling, making, writing and using computer technology.

Projects are taught in line with our creative curriculum in a variety of ways, such as through our METACOGNITION (and self regulation) days, through community projects, including our Christmas gift boxes and creating products to sell at our school fairs and our FESTIVAL OF FUN WEEK, which offers workshops such as stop motion animation and creating products for our local community. Topics are planned to include designing, making and evaluating with lots of metacognitive style questioning to promote independent thoughts and ideas and opportunities to develop knowledge and skills. We also look for opportunities to provide the children with access to places of design and technology, such as a local printing firm and experts, who work in the industry.

As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Learning to cook is a crucial life skill that enables pupils to feed themselves and others now and in later life. Pupils will be taught to understand the principles of a healthy and varied diet and cook a variety of dishes using a range of cooking techniques and skills. They will understand seasonality through the food grown in our garden and know where a variety of ingredients are grown, caught and reared (farm visits).

Intent

Design and Technology encourages children to learn to think and creatively solve problems both as individuals and as members of a team. At Crich Junior School, we encourage children to use their creativity and imagination to design and make products that solve real and relevant problems within a variety of contexts. Considering their own and others' needs, wants and values. We aim to, wherever possible, link work from other disciplines such as mathematics, science, engineering, computing and art. The children are given opportunities to reflect upon and evaluate past and present design technology, its uses and its effectiveness and they are encouraged to become innovators and risk-takers, especially through our Metacognition and Self regulation days.

Implementation

Through a variety of creative and practical activities, we teach the knowledge, understanding and skills needed to engage in the process of designing, making and evaluating. The children design and create products that consider the function and purpose, which are relevant to a range of sectors such as: home, school, leisure, culture and enterprise.

When designing and making, the children are taught to:

Design

- Use research and develop design criteria to inform the design of innovative, functional and appealing products that are fit for purpose, aimed at particular individuals or groups
- Generate, develop, model and communicate their ideas through metacognitive questioning (beginning, middle and end of the process), discussion, annotated sketches, cross-sectional diagrams, prototypes, pattern pieces and computer-aided design.

Make

- Select from a wide range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing, as well as chopping and slicing accurately)
- Select from and use a wide range of materials, ingredients and components according to their functional properties, aesthetic qualities and in cookery - taste

Evaluate

- Investigate and analyse a range of existing products
- Evaluate 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
- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- Understand and use mechanical systems in their products
- Understand and use electrical systems in their products
- Apply their understanding of computing to program, monitor and control their products
- Understand some of the ways that food can be processed and the effect of different cooking practices (including baking and grilling)

Impact

Impact can be measured through metacognitive questioning built into lessons, child-led peer assessment and discussions with children.

We ensure the children can:

- Develop the creative, technical and practical expertise needed to perform everyday tasks confidently in order to participate in an increasingly technological world
- Build and apply knowledge understanding and skills in order to design and make high-quality prototypes and products for a wide range of users and evaluate and test their ideas and products, as well as being able to constructively critique the work of others
- Understand and apply the principles of nutrition and learn how to cook. Children will design and make a range of products and dishes

The impact of the design process ensures that children learn how to take constructive criticism and how to take risks, becoming more resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they will develop a critical understanding of its impact on daily life and the wider world.

| | LKS2 | UKS2 |
|--------------------|---|--|
| Design and Develop | <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.</p> <p>They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].</p> <p>Children 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.</p> <p>They generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.</p> <p>Children can:</p> <ul style="list-style-type: none"> • identify the design features of their products that will appeal to intended customers • use their knowledge of a broad range of existing products to help generate their ideas • design innovative and appealing products that have a clear purpose and are aimed at a specific user • explain how particular parts of their products work • use annotated sketches and cross-sectional drawings to develop and communicate their ideas • when designing, explore different initial ideas before coming up with a final design • when planning, start to explain their choice of materials and components including function and aesthetics • test ideas out through using prototypes • use computer-aided design to develop and communicate their ideas • develop and follow simple design criteria • work in a broader range of relevant contexts, for example entertainment, the home, school, leisure, food industry and the wider environment | <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.</p> <p>They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].</p> <p>Children 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.</p> <p>They generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.</p> <p>Children can:</p> <ul style="list-style-type: none"> • use research to inform and develop detailed design criteria to inform the design of innovative, functional and appealing products that are fit for purpose and aimed at a target market • use their knowledge of a broad range of existing products to help generate their ideas • design products that have a clear purpose and indicate the design features of their products that will appeal to the intended user • explain how particular parts of their products work • use annotated sketches, cross-sectional drawings and exploded diagrams (possibly including computer-aided design) to develop and communicate their ideas • generate a range of design ideas and clearly communicate final designs • consider the availability and costings of resources when planning out designs • work in a broad range of relevant contexts, for example conservation, the home, school, leisure, culture, enterprise, industry and the wider environment |

| | LKS2 | UKS2 |
|-------------|--|---|
| Make | <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 making.</p> <p>Children select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] accurately.</p> <p>They 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. Children can:</p> <ul style="list-style-type: none"> • plan with growing confidence, carefully select from a range of tools and equipment, explaining their choices • select from a range of materials and components according to their functional properties and aesthetic qualities • place the main stages of making in a systematic order <p><i>Practical skills and techniques</i></p> <ul style="list-style-type: none"> • learn to use a range of tools and equipment safely, appropriately and accurately and learn to follow hygiene procedures • use a wider range of materials and components, including construction materials and kits, textiles and mechanical and electrical components with growing independence, measure and mark out to the nearest cm and millimetre • cut, shape and score materials with some degree of accuracy • assemble, join and combine material and components with some degree of accuracy • demonstrate how to measure, cut, shape and join fabric with some accuracy to make a simple product • join textiles with an appropriate sewing technique • begin to select and use different and appropriate finishing techniques to improve the appearance of a product such as hemming, tie-dye, fabric paints and digital graphics | <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 making.</p> <p>Children select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately.</p> <p>They 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. Children can:</p> <ul style="list-style-type: none"> • Plan independently plan by suggesting what to do next with growing confidence, select from a wide range of tools and equipment, explaining their choices • select from a range of materials and components according to their functional properties and aesthetic qualities • create step-by-step plans as a guide to making <p><i>Practical skills and techniques</i></p> <ul style="list-style-type: none"> • learn to use a range of tools and equipment safely and appropriately and learn to follow hygiene procedures • independently take exact measurements and mark out, to within 1 millimetre • use a full range of materials and components, including construction materials and kits, textiles, and mechanical components • cut a range of materials with precision and accuracy • shape and score materials with precision and accuracy • assemble, join and combine materials and components with accuracy • demonstrate how to measure, make a seam allowance, tape, pin, cut, shape and join fabric with precision to make a more complex product • join textiles using a greater variety of stitches, such as backstitch, whip stitch, blanket stitch • refine the finish using techniques to improve the appearance of their product, such as sanding or a more precise scissor cut after roughly cutting out a shape. |

| | LKS2 | UKS2 |
|----------------------------|---|--|
| Technical Knowledge | <p>Children apply their understanding of how to strengthen, stiffen and reinforce more complex structures.</p> <p>They understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages].</p> <p>They understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors].</p> <p>They apply their understanding of computing to program, monitor and control their products.</p> <p>Children can:</p> <ul style="list-style-type: none"> • understand that materials have both functional properties and aesthetic qualities • apply their understanding of how to strengthen, stiffen and reinforce more complex structures in order to create more useful characteristics of products • understand and demonstrate how mechanical and electrical systems have an input and output process • make and represent simple electrical circuits, such as a series and parallel, and components to create functional products • explain how mechanical systems such as levers and linkages create movement • use mechanical systems in their products | <p>Children apply their understanding of how to strengthen, stiffen and reinforce more complex structures.</p> <p>They understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages].</p> <p>They understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors].</p> <p>They apply their understanding of computing to program, monitor and control their products.</p> <p>Children can:</p> <ul style="list-style-type: none"> • apply their understanding of how to strengthen, stiffen and reinforce more complex structures in order to create more useful characteristics of products • understand and demonstrate that mechanical and electrical systems have an input, process and output • explain how mechanical systems, such as cams, create movement and use mechanical systems in their products • apply their understanding of computing to program, monitor and control a product |

| | LKS2 | UKS2 |
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| Evaluate | <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.</p> <p>Children investigate and analyse a range of existing products.</p> <p>They evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.</p> <p>They understand how key events and individuals in design and technology have helped shape the world.</p> <p>Children can:</p> <ul style="list-style-type: none"> • explore and evaluate existing products, explaining the purpose of the product and whether it is designed well to meet the intended purpose • explore what materials/ingredients products are made from and suggest reasons for this • consider their design criteria as they make progress and are willing to alter their plans, sometimes considering the views of others if this helps them to improve their product • evaluate their product against their original design criteria • evaluate the key events, including technological developments, and designs of individuals in design and technology that have helped shape the world. | <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.</p> <p>Children investigate and analyse a range of existing products.</p> <p>They evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.</p> <p>They understand how key events and individuals in design and technology have helped shape the world.</p> <p>Children can:</p> <ul style="list-style-type: none"> • complete detailed competitor analysis of other products on the market • critically evaluate the quality of design, manufacture and fitness for purpose of products as they design and make • evaluate their ideas and products against the original design criteria, making changes as needed |

| | LKS2 | UKS2 |
|------------------------------|--|---|
| Cooking and Nutrition | <p>Children understand and apply the principles of a healthy and varied diet.</p> <p>They prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques.</p> <p>They understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.</p> <p>Children can:</p> <ul style="list-style-type: none"> • start to know when, where and how food is grown (such as herbs, tomatoes and strawberries) in the UK, Europe and the wider world • understand how to prepare and cook a variety of predominantly savoury dishes safely and hygienically • with support, use a heat source to cook ingredients showing awareness of the need to control the temperature of the hob and/or oven • use a range of techniques such as mashing, whisking, crushing, grating, cutting, kneading and baking • explain that a healthy diet is made up of a variety and balance of different food and drink, as represented in the Eatwell Guide and be able to apply these principles when planning and cooking dishes • understand that to be active and healthy, nutritious food and drink are needed to provide energy for the body • prepare ingredients using appropriate cooking utensils • measure and weigh ingredients to the nearest gram and millilitre • start to independently follow a recipe • start to understand seasonality | <p>Children understand and apply the principles of a healthy and varied diet.</p> <p>They prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques.</p> <p>They understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.</p> <p>Children can:</p> <ul style="list-style-type: none"> • know, explain and give examples of food that is grown (such as pears, wheat and potatoes), reared (such as poultry and cattle) and caught (such as fish) in the UK, Europe and the wider world • understand about seasonality, how this may affect the food availability and plan recipes according to seasonality • understand that food is processed into ingredients that can be eaten or used in cooking • demonstrate how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source • demonstrate how to use a range of cooking techniques, such as griddling, grilling, frying and boiling • explain that foods contain different substances, such as protein, that are needed for health and be able to apply these principles when planning and preparing dishes • adapt and refine recipes by adding or substituting one or more ingredients to change the appearance, taste, texture and aroma • alter methods, cooking times and/or temperatures • measure accurately and calculate ratios of ingredients to scale up or down from a recipe • independently follow a recipe. |

| | Year 3 | Year 4 | Year 5 | Year 6 |
|---------------------------|--|--|---|---|
| Design and Develop | <p>Can they show that their design meets a range of requirements?</p> <p>Can they put together a step by step plan, which shows the order and what equipment/tools they need?</p> <p>Can they describe their design using an accurately labelled sketch and words?</p> <p>Is their plan realistic?</p> | <p>Can they come up with at least one idea about how to create their product</p> <p>Do they take in to account the ideas of others when designing?</p> <p>Can they produce a plan and explain it to others?</p> <p>Can they suggest some improvements and say what was good and not so good about their original design?</p> | <p>Can they come up with a range of ideas after they have collected information?</p> <p>Do they take a user's view into account when designing?</p> <p>Can they produce a detailed step by step plan?</p> <p>Can they suggest some alternative plans and say what the good points and drawbacks are about each one?</p> | <p>Can they use a range of information to inform their design?</p> <p>Can they use market research to inform plans?</p> <p>Can they work within constraints?</p> <p>Can they follow and refine their plan if necessary?</p> <p>Can they justify their plan to someone else?</p> <p>Do they consider culture and society in their designs?</p> |
| Make | <p>Can they use equipment and tools accurately?</p> | <p>Can they tell if their finished product is going to be good quality?</p> <p>Are they conscious of the need to produce something that will be liked by others?</p> <p>Can they show a good level of expertise when using a range of tools and equipment?</p> | <p>Can they explain why their finished product is going to be of good quality?</p> <p>Can they explain how their product will appeal to the audience?</p> <p>Can they use a range of tools and equipment expertly?</p> | <p>Can they use tools and materials precisely?</p> <p>Can they identify and change the way they are working in needed?</p> |

| | Year 3 | Year 4 | Year 5 | Year 6 |
|---------------------|--|--|---|--|
| Technical Knowledge | <p>Do they use the most appropriate materials?</p> <p>Can they work accurately to make cuts and holes?</p> <p>Can they join materials?</p> | <p>Have they thought about how to make their product strong?</p> <p>Can they devise a template?</p> <p>Can they explain how to join things in a different way?</p> <p>Have they thought about how to present their product in an interesting way?</p> <p>Can they demonstrate a good level of expertise when using a range of materials and equipment?</p> | <p>Are their measurements accurate enough to ensure that everything is precise?</p> <p>Can they use a range of joining techniques?</p> <p>How have they ensured that their product is strong and fit for purpose?</p> | <p>Did they consider the use of the product when selecting materials?</p> <p>Does their product meet all of the design criteria?</p> <p>Have they thought about how their product could be sold?</p> <p>Can they justify why they chose certain materials?</p> <p>Can they work within a budget?</p> <p>Have they ensured accuracy and precision throughout?</p> <p>Can they hide joints to improve the look of their product?</p> |
| Evaluate | <p>What did they change which made their design better?</p> | <p>Have they thought of how they will check if their design is successful?</p> <p>Can they begin to explain how they can improve their original design?</p> <p>Can they evaluate their product, thinking of both the way it works?</p> | <p>Do they keep checking that their design is the best it can be?</p> <p>Do they check whether anything could be improved?</p> <p>Can they evaluate the appearance and function against the original criteria?</p> | <p>How well did they test and evaluate their final product?</p> <p>Is it fit for purpose?</p> <p>Can they identify what would improve it?</p> <p>Can they identify whether different resources might have improved their product?</p> |

| | Year 3 | Year 4 | Year 5 | Year 6 |
|-----------------------|---|---|--|--|
| Cooking and Nutrition | <p>Can they talk about the different food groups and name food from each group?</p> <p>Do they understand that food has to be grown, farmed or caught in the UK, Europe and the wider world?</p> <p>Can they use a wider variety of ingredients and techniques to prepare and combine ingredients safely?</p> | <p>Do they understand what makes a healthy and balanced diet, and that different foods and drinks provide different substances the body needs to be healthy and active?</p> <p>Do they understand seasonality and the advantages of eating seasonal and locally produced food ?</p> <p>Can they read and follow recipes which involve several processes, skills and techniques?</p> | <p>Do they understand the main food groups and the different nutrients that are important for health ?</p> <p>Do they understand how a variety of ingredients are grown, reared, caught and processed to make them safe and palatable/tasty to eat ?</p> <p>Can they select appropriate ingredients and use a wide range of techniques to combine them ?</p> | <p>Can they confidently plan a series of healthy meals based on the principles of a healthy and varied diet?</p> <p>Can they use information on food labels to inform choices?</p> <p>Can they research, plan and prepare and cook a savoury dish applying their knowledge of ingredients and their technical skill?</p> |