# Burnside Primary School

# Design and Technology Policy

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Contents

1. Curriculum Statement

Curriculum Aims

Design and Technology is an inspiring, rigorous and practical subject. Design and Technology encourages children to learn to think and intervene creatively to solve problems both as individuals and as members of a team. At Burnside Primary 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 to other disciplines such as mathematics, science, engineering, computing and art. The children are also given opportunities to reflect upon and evaluate past and present design technology, its uses and its effectiveness and are encouraged to become innovators and risk-takers.

Intent

The sequence of units has been carefully considered to reflect progression and an alignment, where possible, to other disciplines, e.g., the Y4 and Y6 units on electrical systems consolidates learning in the corresponding units in science.

**Long Term Plan**

| | Autumn | Spring | Summer |
|---|---|---|---|
| Year 1 | Mechanisms<br>Sliders and levers | Food<br>Preparation of fruit and vegetables (Fruit kebabs) | Structures<br>Bridges |
| Year 2 | Food<br>Preparing fruit and vegetables (Fruit salad) | Mechanisms<br>Wheels and axles | Textiles<br>Template and joining techniques |
| Year 3 | Structures<br>Freestanding structures including computer generated designs | Food<br>Healthy and varied diet | Textiles<br>2d shape to 3d product |
| Year 4 | Mechanical systems<br>Levers and linkages | Electrical systems<br>Simple circuits and switches | Foods<br>Designing a healthy menu |
| Year 5 | Structures<br>Frame Structures | Food<br>Celebrating culture – Asia/South America | Mechanical Systems<br>Pulleys or gears |
| Year 6 | Textiles<br>Combining different fabric shapes (including computer aided design) | Electrical systems<br>More complex switches and circuits | Food<br>Celebrating culture – Europe |

*Please see separate medium term plans for more information regarding our intent.*

Implementation

Through a variety of creative and practical activities, we teach the knowledge, understanding and skills needed to engage in an iterative process of designing and making. The children work in a range of relevant contexts (for example home, school, leisure, culture, enterprise, industry and the wider environment).

When designing and making, the children are 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 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,
- understand and use electrical systems in their products,
- apply their understanding of computing to program, monitor and control their products

Key skills and key knowledge for D and T have been mapped across the school to ensure progression between year groups. This also ensures that there is a context for the children's work in Design and Technology; that they learn about real life structures and the purpose of specific examples, as well as developing their skills throughout the programme of study.

Design and technology lessons are also taught as a block so that children's learning is focused throughout each unit of work.

<u>Impact</u>

We ensure the children

- 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 and 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. Children will design and make a range of products. A good quality finish will be expected in all design and activities made appropriate to the age and ability of the child.

Children 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.

2. Teaching and Learning

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 blocks which allows for more effective learning in which teachers can focus on teaching and developing DT skills, allowing children to develop their ideas and techniques. Units of work have been selected and planned to ensure a balance of materials, skills, knowledge and understanding throughout each Key Stage. Units of work are planned to include designing and making assignments (DMAs) supported by focused practical tasks or skills teaching (FPTs) and work involving reviewing existing products (IDEAs). All children should have a breadth and balance of experience.

The collaborative nature of lessons is planned to support those children with SEN and EAL alongside, where possible, pre and post learning of vocabulary utilising resources such as word banks.

3. Assessment

Children's skills will be assessed and developed by the teacher during lessons and through critical discussion at the end of each unit. No formal assessment is recorded. Displays within the classroom will reflect a range of work across key stages, to celebrate and exhibit the work of children, of all abilities.

4. Planning and Resources

On-line DT plans and resources, produced by the Design and Technology Association, are available on the shared drive. Teachers also collaborate with their year group partners, to design schemes of work to support specific bespoke projects. Teachers will either select materials needed to complete a DT project from the DT Resource area, purchase any materials needed for the design, construction and evaluation of a project or decide to use recycled materials or junk modelling to help complete a project. Children are taught to use tools and equipment in a sensible, safe and efficient manner.

5. Organisation

Design and Technology planning is mapped in blocks on the Whole School Curriculum Overview. Units of work are planned to include a balance of designing and making assignments, teaching key skills and work involving reviewing existing products. Links with other subject areas may be made where appropriate.

6. EYFS

The staff team will plan for children to experience creative opportunities and develop key skills and techniques within the EYFS curriculum. There will be a focus on developing fine motor skills and learning how to plan, design and produce the finished project.

Nursery and Reception classes will be, where appropriate, included in whole school projects, workshops, events and competitions associated with Design and Technology.

7. KS1 and KS2

Teachers will plan for lessons so that children will learn to design purposeful, functional, appealing products for themselves and others based on design criteria and to communicate their ideas through talking and drawing. They learn to select from and use a range of tools and equipment to perform practical tasks and to choose from a wide range of materials and components. They also learn to explore and evaluate their design and product.

8. Equal Opportunities

Whole school policy on equal opportunities will be adhered to in Design and Technology activities. Teachers ensure that children have access to the range of Design and Technology activities and use opportunities within Design and Technology to challenge stereotypes. Children are encouraged and supported to develop their Design and Technology capability using a range of materials. Children with special needs or disabilities will be differentiated for and supported appropriately, to ensure development of skills and equal access to the Design and Technology curriculum.

9. Inclusion

All children will be supported through differentiation, adaptation or adult support, to enable equal access to learning in Design and Technology.

10. Role of the Subject Leader

The subject leader will monitor the teaching and learning of Design and Technology across the school; ensuring a high quality, broad and stimulating curriculum. They will also maintain a range of good-quality materials and tools, enabling teachers to resource and teach effectively.

11.Parents

We encourage all parents and carers to support and assist with whole school events and Design and Technology projects.

Appendix 1 - Vocabulary Ladder

**Reception**

make, model

**Year 1**

Design, plan, product, explain, cut, join, glue, sew, fix, tape, mix, stir, evaluate, strong, stable, stiff, sturdy, running stitch, needle, thread, water, soap, clean, cut, chop, knife, blade, safely, ingredients.

**Year 2**

Design criteria, materials, template, mock-up, choose, explain, measure, centimetres, grams, improvement, reason, mechanism, rotate, lever, slider, axle, fixed, back tack, template, eye (of the needle), knot, weigh, measure, recipe, hygiene, texture, taste.

**Year 3**

Research, annotate, sketch, appealing, attach, suitability, function, purpose, appropriate, technique, accurately, quality, functional, investigate, analyse, successful, criteria, reinforce, strengthen, technique, folding, rolling, shaping, joining, cross stitch, secure (the first/last stitch), overstitch, bacteria, germs, savoury, sweet.

**Year 4**

Prototype, adapt, measurements, centimetres, millimetres, circuit, buzzer, lamp, switch, battery, crocodile clip, wire, control, program, command, algorithm, back stitch, pattern, purpose, appearance, views, justify, Circuit, buzzer, lamp, switch, battery, crocodile clip, wire, control, program, command, algorithm, back stitch, pattern Varied, diet, protein, carbohydrates, dairy, fat, grown, reared, processed, caught.

**Year 5**

User, sources, cross-sectional, step-by-step, process, competently, aesthetically pleasing, functionality, positive features, draw backs, gears, pulleys, cams, levers, linkages, pivot, blanket stitch, seam allowance, Ripe, chilled, harvest, seasonal, seasoned.

**Year 6**

Market research, culture, society, exploded diagram, cut, join, glue, sew, fix, tape, mix, stir, choose, explain, measure, centimetres, grams, appropriate, technique, accurately, quality, functional, circuit, buzzer, lamp, switch, battery, crocodile clip, wire, control, program, command, algorithm, back stitch, pattern, competently, aesthetically pleasing, evaluate, improvement, reason, investigate, analyse, successful, criteria, purpose, appearance, views, justify, functionality, positive features, draw backs, strong, stable, stiff, sturdy, running stitch, needle, thread, mechanism, rotate, lever, slider, axle, fixed, back tack, template, eye (of the needle), knot, reinforce, strengthen, technique, folding, rolling, shaping, joining, cross stitch, secure (the first/last stitch), overstitch, circuit, buzzer, lamp, switch, battery, crocodile clip, wire, control, program, command, algorithm, back stitch, pattern, gears, pulleys, cams, levers, linkages, pivot, blanket stitch, seam allowance, refrigerated, frozen, rancid, stale, mouldy, expiration date, budget.

Design and Technology

Content Overview

| | Autumn | Spring | Summer |
|---|---|---|---|
| Year 1 | Mechanisms<br>Sliders and levers | Food<br>Preparation of fruit and vegetables<br>(Fruit kebabs) | Structures<br>Bridges |
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Design and Technology
Progression in Skills

| | Generating Ideas | Making | Evaluating | Technical Knowledge | Food and Nutrition |
|---|---|---|---|---|---|
| Year 1 | Think of own ideas for design<br>Use pictures and words to plan<br>Design a product and follow a design criteria | Explain what is being made and why<br>Select appropriate tools and equipment for the purpose | Evaluate own and existing products<br><br>Say whether the product fits the design brief | Use construction materials with supervision<br><br>Know about the movement of simple mechanisms such as sliders and levers | Know how to peel, cut, grate, mix and mould foods with supervision |
| Year 2 | Think of own ideas and plan what to do next<br><br>Describe designs using pictures, diagrams, models and ICT<br><br>Create a design criteria<br><br>Design a product | Explain what is being made<br><br>Choose appropriate tools and equipment and explain some tools are more appropriate than others | Evaluate products saying which is better and why<br><br>Evaluate own products highlighting positives and areas for improvement<br><br>Explain how/why improvements should be made | Use construction materials competently<br><br>Know about the movement of simple mechanisms such as wheels and axles<br><br>Cut then join materials including textiles | Know how to peel, cut, grate, mix and mould foods with a range of shapes and textures |
| Year 3 | Create a design that meets a range of requirements<br><br>Plan the equipment and tools needed | Use a range of tools and equipment accurately<br><br>Measure and mark out materials and components with a degree of accuracy | Evaluate the appearance and usability of own and existing products | Use construction materials competently<br><br>Know about the movement of simple | Know how to peel, cut, grate, mix and mould foods with a range of shapes and textures |

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| | Describe a design accurately and include a labelled diagram<br><br>Gather information to help design a product (research, asking people) | Join and assemble materials and components with a degree of accuracy | Explain how/why improvements should be made<br><br>Recreate designs based on findings | mechanisms such as wheels and axles<br><br>Cut then join materials including textiles using a variety of methods<br><br>Understand seam allowances<br><br>Use a range of finishing techniques | Understand changes in state when products are heated and cooled<br><br>Begin to cook foods under supervision |
| Year 4 | Generate more than one idea for how to create a product<br><br>Gather information to help design a product (Questionnaire, mini interview, research)<br><br>Produce a detailed plan with labelled diagrams, a written explanation and step by step instructions | Use a range of tools and equipment (including electricity) appropriate to the task with accuracy<br><br>Measure and mark out materials and components accurately<br><br>Join and assemble materials and components accurately | Explain how/why improvements should be made to own and existing products<br><br>Design ways of comparing products and execute the design | Use construction materials competently<br><br>Know about the movement of simple mechanisms such as levers and linkages<br><br>Use an electrical system to make a product operate<br><br>Use a range of finishing techniques | Understand changes in state when products are heated and cooled<br><br>Design a menu around a theme<br><br>Cook foods under supervision |
| Year 5 | Generate a range of ideas after collating relevant information<br><br>Present information gathered in a variety of ways<br><br>Produce a detailed plan with labelled diagrams, cross-sectional drawings, | Use a range of tools and equipment precisely<br><br>Consider the aesthetic qualities and functionality of the product | Evaluate the appearance of the product<br><br>Test the function of the product in a range of conditions and against the original criteria | Use construction materials competently<br><br>Know about the movement of simple mechanisms such as pulleys or gears | Understand changes in state when products are heated and cooled<br><br>Design a menu around a theme based on consumer research |

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| | computer generated designs, a written explanation and step by step instructions<br><br>Work with constraints, refining and justifying plans as necessary | Refine the product or amend the design based on the making process | Suggests improvements for each part of the designing and making process | Use a range of finishing techniques | Cook foods using a range of methods under supervision |
| Year 6 | Generate a range of ideas after collating relevant information<br><br>Present information gathered in a variety of ways including as a presentation to peers<br><br>Independently produce a detailed plan with labelled diagrams, cross-sectional drawings, computer generated designs, a written explanation and step by step instructions<br><br>Independently work with constraints, refining and justifying plans as necessary | Use a range of tools and equipment precisely<br><br>Select alternative tools to enhance the product<br><br>Consider the aesthetic qualities and functionality of the product<br><br>Refine the product or amend the design based on the making process | Evaluate the appearance of the product using a criteria generated independently<br><br>Test the function of the product in a range of conditions and against the original criteria<br><br>Suggests improvements for each part of the designing and making process<br><br>Calculate cost, sale price and profit and explain reasoning | Use construction materials competently<br><br>Know about the more complex switches and circuits and how they function<br><br>Cut then join materials including textiles using a variety of methods<br><br>Understand seam allowances<br><br>Use a range of finishing techniques | Understand changes in state when products are heated and cooled<br><br>Design a menu around a theme based on consumer research<br><br>Sell the menu/product as appropriate<br><br>Cook foods using a range of methods under supervision |