



Design and Technology at Banks Lane Junior School

At Banks Lane Junior School we intend to give all of our students the opportunity to experience and explore a range of new skills through our Design and Technology sessions. Children are given the opportunity to research, design, create and evaluate through different projects during their time at our school.

Key Concepts are golden threads that run through our curriculum subjects and support us in revisiting and reviewing previously taught knowledge and content. They support in making connections in learning so that it becomes 'sticky' knowledge. In Design & Technology these concepts are:

KEY CONCEPTS

Research Design Create Evaluate Safety

Substantive knowledge is the factual content for a subject which must be connected into a careful sequence. Substantive knowledge is understood better with repeated encounters in meaningful contexts.

Disciplinary knowledge is the action taken within a particular subject to gain the substantive knowledge through skills, critical thinking and enquiry.

Progression in Design and Technology skills and disciplinary knowledge

Aims of KS2 Design and Technology National Curriculum

- Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an interactive 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].

KS2 Curriculum Objectives

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.

Reception - Year 2

Key concepts: Innovation, Functionality, Nutrition, Research, Evaluate, Design, Materials Tools and Components, Safety, Significant People

- Use models, pictures and words to describe what I want to do.
- Show that I can create products for a use and purpose using my practical ideas.
- Use tools and manipulate materials with help where needed.
- Talk about mine and other people's work in simple terms and describe how a product works.
- Explain what I am making and which tools I am using.
- Begin to understand where food comes from.
- Begin to know what a healthy diet is.
- Prepare simple dishes.
- Design purposeful, functional and appealing products for myself and other users based on design criteria.
- Generate, develop, model and communicate ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.
- Select from and use a range of tools and equipment to perform practical skills (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.
- Explore and evaluate a range of existing products.
- Evaluate my ideas and products against design criteria.
- Recognise what I have done well and suggest what I can do better in the future.
- Build structures, exploring how they can be made stronger, stiffer and more stable.
- Explore and use mechanisms in my products. Select appropriate tools, techniques and materials and explain my choice.
- Use the basic principles of a healthy and varied diet to prepare dishes.
- Understand where food comes from.

Where possible, our concepts are aligned with Banks Lane Infant School to ensure continuous development of knowledge. Our teachers understand the importance of revisiting and reviewing the children's prior learning in the previous key stages and linking key concepts to encourage retention and allow children to progress.



Year 3

Key concepts: Research, Design, Create, Evaluate, Safety

Design Criteria:

- Design, make and evaluate some packaging to hold rocky road to raise awareness of Children in Need.
- Design, make and evaluate a sarcophagus toy for someone younger to understand the mummification process.
- Design, make and evaluate a salad based on a traditional Greek Salad to understand what makes a healthy dish.

Key Skills

I can generate and clarify ideas through discussion with peers and adults to develop design criteria.

I can generate realistic and appropriate ideas and my own design criteria through discussion, focusing on the needs of the user.

I can use annotated sketches and prototypes to develop, model and communicate ideas.

I can plan the main stages of a recipe, listing ingredients, utensils and equipment.

I can order the main stages of making.

I can select and use appropriate utensils and equipment to prepare and combine ingredients.

I can select from a range of ingredients to make appropriate food products, thinking about sensory characteristics.

I can select from and use appropriate tools with some accuracy to cut and join materials and components.

I can explain my choice of materials according to functional properties and aesthetic qualities.

I can use finishing techniques suitable for the product I am creating.

I can select and use appropriate tools to measure, mark out, cut, score, shape and assemble with some accuracy.

I can carry out sensory evaluations of a variety of ingredients and products and record the evaluations using tables and simple graphs.

I can evaluate the ongoing work and the final product with reference to the design criteria and the views of others.

I can investigate and analyse books, videos and products with pneumatic mechanisms.

I can evaluate my own products and ideas against criteria and user needs, as I design and make.

I can investigate and evaluate a range of existing shell structures including the materials, components and techniques that have been used.

Key Vocabulary:

User, purpose, design, prototype, reflect



Year 4

Design Criteria:

- To design, make and evaluate a torch using a simple circuit and a switch to use on a night walk.
- To design, make and evaluate a Christmas card that involves a moving mechanism.
- To design, make and evaluate a purse to be used by an Anglo-Saxon person.

Key Skills

I can generate realistic ideas and my own design criteria through discussion, focusing on the needs of the user.

I can research different types of materials and fastenings to help me design a functional and appealing product.

I can generate realistic ideas and my own design criteria through discussion, focusing on the needs of the user.

I can design a product that meets the design criteria.

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I can produce detailed lists of equipment and fabrics relevant to my tasks.

I can select from and use appropriate tools with some accuracy to cut, shape and join paper and card.

I can make prototypes using different levers and linkages.

I can complete a simple circuit with a switch.

I can select and use materials and components, including construction and electrical components according to their functional and aesthetic qualities.

I can make and use a 2D paper patterns to cut material (remembering to leave a seam allowance).

I can use a range of decorating techniques to make my product appealing to the user.

I can use different sewing techniques to join two pieces of material and create a seam.

I know and can use technical vocabulary relevant to the project.

I can investigate and analyse products with lever and linkage mechanisms.

I can evaluate my own products and ideas against criteria and user needs, as I design and make.

I can investigate and analyse a range of battery powered products.

I can evaluate my own products and ideas against criteria and user needs, as I design and make.

I can consider the views of others and use this to improve my work.

Key Vocabulary:

Innovation, evaluate, appealing, function, design criteria



Year 5

Design Criteria:

- To design, make and evaluate container for tomatoes and an appropriate mechanical system to transport the container across a ravine.
- To design, make and evaluate a money box suitable for collecting money for our Children in Need Fair.
- To design, make and evaluate a healthy meal for Summer.

Key Skills

I can research existing products that have both **functional** properties and **aesthetic** qualities.

I can indicate the design features of their products that will appeal to intended users.

I can find out about different ways of transporting produce in developing countries and research the needs of specific groups.

I can carry out research on levers, gears and pulleys.

I can use annotated sketches and front and side diagrams to develop and communicate our ideas.

I can model ideas using prototypes.

I can communicate ideas through annotated sketches.

I can accurately measure, mark out, cut and shape materials and components.

I can accurately assemble, join and combine materials and components.

I can accurately apply a range of finishing techniques, including those from art and design.

I can select appropriate tools, equipment and materials.

I can accurately assemble, join and combine materials and components, including a mechanical system.

I can critically evaluate the quality of the design, manufacture and whether it is fit for purpose.

I can identify the strengths and areas for development in their ideas and products.

I can consider the views of others, including intended users, to improve my work.

I can evaluate my product against the design criteria considering the following: user, purpose, functionality, design decisions, innovation and authenticity.

I can evaluate by identifying areas for further development.

Key Vocabulary:

Design decisions, authentic, design specification, research, evaluate



Year 6

Design Criteria:

- Design, make and evaluate a mobile phone carrier for yourself or a family member to keep it secure.
- Design, make and evaluate a toy with oscillating, rotating or reciprocating movement for a younger sibling or family member for them to play with.
- Design, make and evaluate a light for yourself to use at the leavers' assembly.

Key Skills

I can use research to develop a design specification for a functional product.

I can generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources.

I can generate and develop innovative ideas and share and clarify these through discussion.

I can take account of constraints including time, resources and cost.

I can communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams.

I can develop a simple design specification to guide thinking.

I can develop, model and communicate ideas through talking, drawing, templates, mock-ups and prototypes.

I can design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification.

I can select from and use a range of tools and equipment to make products that are accurately assembled and well finished.

I can work within the constraints of time, resources and cost.

I can produce detailed lists of tools, equipment and materials.

I can formulate a step-by-step plan to guide making, listing tools, equipment, materials and components.

I can competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product.

I can continually evaluate and modify the working features of the product to match the initial design specification.

I can compare the final product to the original design specification.

I can test products with the intended user, where safe and practical, and critically evaluate the quality of the design, manufacture, functionality whether it is fit for purpose.

I can consider the views of others to improve their work.

Key Vocabulary:

Modify, intended user, critically evaluate, quality