Design and Technology

At The Belham Primary School we use Design and Technology (DT) as part of our enriched curriculum, enabling children to become creative problem solvers and developing their knowledge and understanding of a range of tools.

Teaching and Learning

At The Belham we follow the 'Plan, Design, Make and Evaluate' approach to the teaching of DT, as outlined in the National Curriculum Programmes of Study document. We promote children´s creativity and imagination and pupils design and make products within a variety of contexts, considering their own and others' needs, wants and values.

The technical skills we teach encompass the following areas: Construction, Mechanisms, Textiles and Food and Nutrition. Our units are carried out in three/four main annual DT projects and are presented in Design Booklets. These include a design brief and are followed by the 'Plan, Design, Make and Evaluate' approach. Each of our project booklets is stapled and put in their personal portfolio folder, which will move with each student up the school.

Planning	Designing	Making	Evaluation
There is an emphasis on the planning stage, allowing for lots of talk and questioning to establish what the key features of the design will be, what materials should be used and how they will be shaped or reinforced. Pupils will be making choices throughout the process and testing and evaluating. They will be encouraged to consider durability, performance and sustainability, as well as aesthetics in their designs.	In design, there is a focus on drawing; children will develop their skills in drawing 3D objects, creating cross sectional and exploding diagrams. They will annotate key features of their designs. Children will become increasingly confident in the use of Computer Aided Design, such as paint software, assemble simulation, publisher and 3D printer programs (tinkercad).	Children will have an exposure to a range of tools and resources. They will make choices in how to cut, join and strengthen. They will become increasingly accurate in measuring, cutting and preparing different materials for use. In textiles, they will practise different stitches to join and embellish fabrics. They will understand how to make 3D products from 2D fabric. Cookery progression will take them through a range of ways to cut and prepare food, as well as learning where food comes from, healthy eating and seasonal foods.	Children will not only evaluate the designs of professionals and peers but also will be able to comment of the effectiveness of their own mock ups and creations.

Assessment

DT learning is recorded through children´s DT booklets and photographic record. Teachers assess children's knowledge, understanding and skills in design and technology by making observations of the children working during lessons. We make sure that students understand the 'Plan, Design, Make and Evaluate' approach and are also encouraged to be critical of their own work, highlighting their own next steps.

It is our mission to provide children with the right tools to learn how to take risks, become more resourceful, innovative, enterprising and capable citizens.

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Subject content

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/239041/PRIMARY_national_curriculum_-_Design_and_technology.pdf

Key Stage 1

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment].

At the end of Key Stage 1 most pupils will be able to:

Design

- design purposeful, functional, appealing products for themselves and other users based on design criteria
- generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology

Make

- select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]
- select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics

Evaluate

- explore and evaluate a range of existing products
- evaluate their ideas and products against design criteria

Technical knowledge

- build structures, exploring how they can be made stronger, stiffer and more stable
- explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.

Key Stage 2

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].

By the end of key stage 2, most children will be able to:

Design

- use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups
- generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Make

- select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately
- select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

Evaluate

- investigate and analyse a range of existing products
- evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- understand how key events and individuals in design and technology have helped shape the world

Technical knowledge

- apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
- understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
- apply their understanding of computing to program, monitor and control their products.

DT overview

Project	1	2	3	Optional Project
Year 1	**Food and Nutrition** **Preparing fruit and vegetables**	**Mechanisms** **Sliders and leavers**	**Structures** **Freestanding structures**	Textiles
Year 2	**Food and Nutrition** **Preparing fruit and vegetables**	**Mechanisms** **Wheels and axles**	**Textiles** **Templates and joining techniques**	Structures
Year 3	**Food and Nutrition** **Healthy and varied diet**	**Structures** **Shell structures** (including computer aided design)	**Textiles** **2D Shape to 3D product**	Mechanisms
Year 4	**Food and Nutrition** **Healthy and varied diet**	**Mechanical systems** **Leavers and Linkages**	**Electrical systems** **Simple Circuits and Switches** (including programming and control)	Textiles
Year 5	**Food and Nutrition** **Celebrating culture and seasonality**	**Structures** **Frame structures**	**Electrical systems** **More Complex Switches and Circuits** (including programming, monitoring and control)	Textiles
Year 6	**Food and Nutrition** **Celebrating culture and seasonality**	**Mechanical systems** **Pulleys or Gears**	**Textiles** **Combining different Fabrics Shapes** (including computing aided design)	Structures

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Technical knowledge and Understanding

Project	1	2	3
Year 1	**<u>Food and Nutrition</u>** **Preparing fruit and vegetables** - Understand where a range of fruit and vegetables come from e.g. farmed or grown at home. - Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of The eatwell Plate. - Know and use technical and sensory vocabulary relevant to the project.	**<u>Mechanisms</u>** **Sliders and leavers** - Explore and use sliders and levers. - Understand that different mechanisms produce different types of movement. - Know and use technical vocabulary relevant to the project.	**<u>Structures</u>** **Freestanding structures** - Know how to make freestanding structures stronger, stiffer and more stable. - Know and use technical vocabulary relevant to the project.
Year 2		**<u>Mechanisms</u>** **Wheels and axles** - Explore and use sliders and levers - Understand that different mechanisms produce different types of movement. - Know and use technical vocabulary relevant to the project.	**<u>Textiles</u>** **Templates and joining techniques** - Understand how simple 3-D textile products are made, using a template to create two identical shapes. - Understand how to join fabrics using different techniques e.g. running stitch, glue, over stitch, stapling. - Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons. - Know and use technical vocabulary relevant to the project.
Year 3	**<u>Food and Nutrition</u>** **Healthy and varied diet** - Know how to use appropriate equipment and utensils to prepare and combine food. - Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught. - Know and use relevant technical and sensory vocabulary appropriately.	**<u>Structures</u>** **Shell structures** (including computer aided design) -Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes. - Develop and use knowledge of how to construct strong, stiff shell structures. - Know and use technical vocabulary relevant to the project.	**<u>Textiles</u>** **2D Shape to 3D product** - Know how to strengthen, stiffen and reinforce existing fabrics. - Understand how to securely join two pieces of fabric together using blanket stitch or cross stitch. - Understand the need for patterns and seam allowances. - Know and use technical vocabulary relevant to the project.
Year 4		**<u>Mechanical systems</u>** **Leavers and Linkages** - Understand and use lever and linkage mechanisms. - Distinguish between fixed and loose pivots. - Know and use technical vocabulary relevant to the project.	**<u>Electrical systems</u>** **Simple Circuits and Switches** (including programming and control) - Understand and use lever and linkage mechanisms. - Distinguish between fixed and loose pivots. - Know and use technical vocabulary relevant to the project.
Year 5	**<u>Food and Nutrition</u>** **Celebrating culture and seasonality** - Know how to use utensils and equipment including heat sources to prepare and cook food. - Understand about seasonality in relation to food products and the source of different food products. - Know and use relevant technical and sensory vocabulary.	**<u>Structures</u>** **Frame structures** - Understand how to strengthen, stiffen and reinforce 3-D frameworks. - Know and use technical vocabulary relevant to the project.	**<u>Electrical systems</u>** **More Complex Switches and Circuits** (including programming, monitoring and control) - Understand and use electrical systems in their products. - Apply their understanding of computing to program, monitor and control their products. - Know and use technical vocabulary relevant to the project.

Year 6		**<u>Mechanical systems</u>** **Pulleys or Gears** • Understand that mechanical and electrical systems have an input, process and an output. • Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement. • Know and use technical vocabulary relevant to the project.	**<u>Textiles</u>** **Combining different Fabrics Shapes** (including computing aided design) - A 3-D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics. - Fabrics can be strengthened, stiffened and reinforced where appropriate.