

Substantive & Disciplinary knowledge in DT

Intent

At Brabourne, our design and technology curriculum provides opportunities for the children to think of themselves as, and become, designers and producers of purposeful products that will be used in real-life contexts. We encourage the children to think and intervene creatively to solve problems both as individuals and as members of a team, within a variety of contexts. The children consider their own and others' needs, wants and values. The children are also given opportunities to reflect upon and evaluate past and present design technology, its uses and effectiveness and they are encouraged to become innovators and risk takers.

Design and Technology is promoted through collaborative and experiential learning opportunities. Wherever possible knowledge and skills learned in design and technology are linked to real life contexts so that children can gain relevant, concrete and modern experiences in areas they might not ordinarily have the opportunity to encounter.

The principal aims of DT at Brabourne are 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 and the work of others
- understand and apply the principles of nutrition and learn how to cook

End Points:

By the end of EYFS, pupils will:

- be able to explore and choose a range of materials to create and make things
- be able to investigate how things work and

- draw, build and make things which fulfil a function

By the end of Key Stage 1, pupils will:

- learn the knowledge and skills needed to design and make products for a range of relevant contexts
- be able to design and test products that are purposeful and appealing
- select tools and materials which are most suitable to make their products from
- evaluate their products against existing products and design criteria
- develop the technical knowledge needed to build structures which are stronger and more stable and be able to use a range of mechanisms
- develop an understanding of where food comes from and how to use the basic principles of a healthy diet to make their own simple dishes

By the end of Key Stage, pupils will:

- develop further knowledge and skills to enable them to design and make purposeful and quality products in different contexts
- be able to research how existing products work and use this to develop designs and products to meet a design brief
- be able to produce more detailed, annotated designs and to test and refine their ideas
- be able to select and use a wider range of tools and materials according to their function and properties
- develop the technical knowledge required to make their products work effectively
- be able to evaluate the effectiveness and quality of their products and use this to improve their work
- develop an understanding of a healthy and varied diet and be able to prepare and cook a range of dishes

Implementation

At Brabourne, the teaching of design and technology has been carefully considered to enable our pupils to become confident and competent designers and producers. At Brabourne, we follow the Kapow programme. Alongside this our highly skilled subject leaders have carefully worked to create a Subject Progression Document where objectives for each year group are progressively mapped out towards clearly defined end points. This ensures our pupils are given the required skills and knowledge they need to progress. The progressive objectives also enable teachers to identify and plug gaps in pupils' knowledge and skills.

Children develop a deep understanding of **key concepts** as they move through our design and technology curriculum. These key concepts have been carefully considered and identified as the core knowledge and skills required to successfully achieve in art and design. They are revisited and developed as the pupils move through the school to ensure that knowledge and skills are firmly embedded within their long-term memory. The expectation is that, by the end of primary School, children will know and understand these key concepts and to give them a solid foundation to enter the Design and technology curriculum at KS3.

The Design and Technology curriculum is structured into five **key concepts**:

Designing

Making

Evaluating

Technical Knowledge

Cooking and nutrition

Curriculum areas studied:

Textiles

Electrical systems

Food

Mechanisms

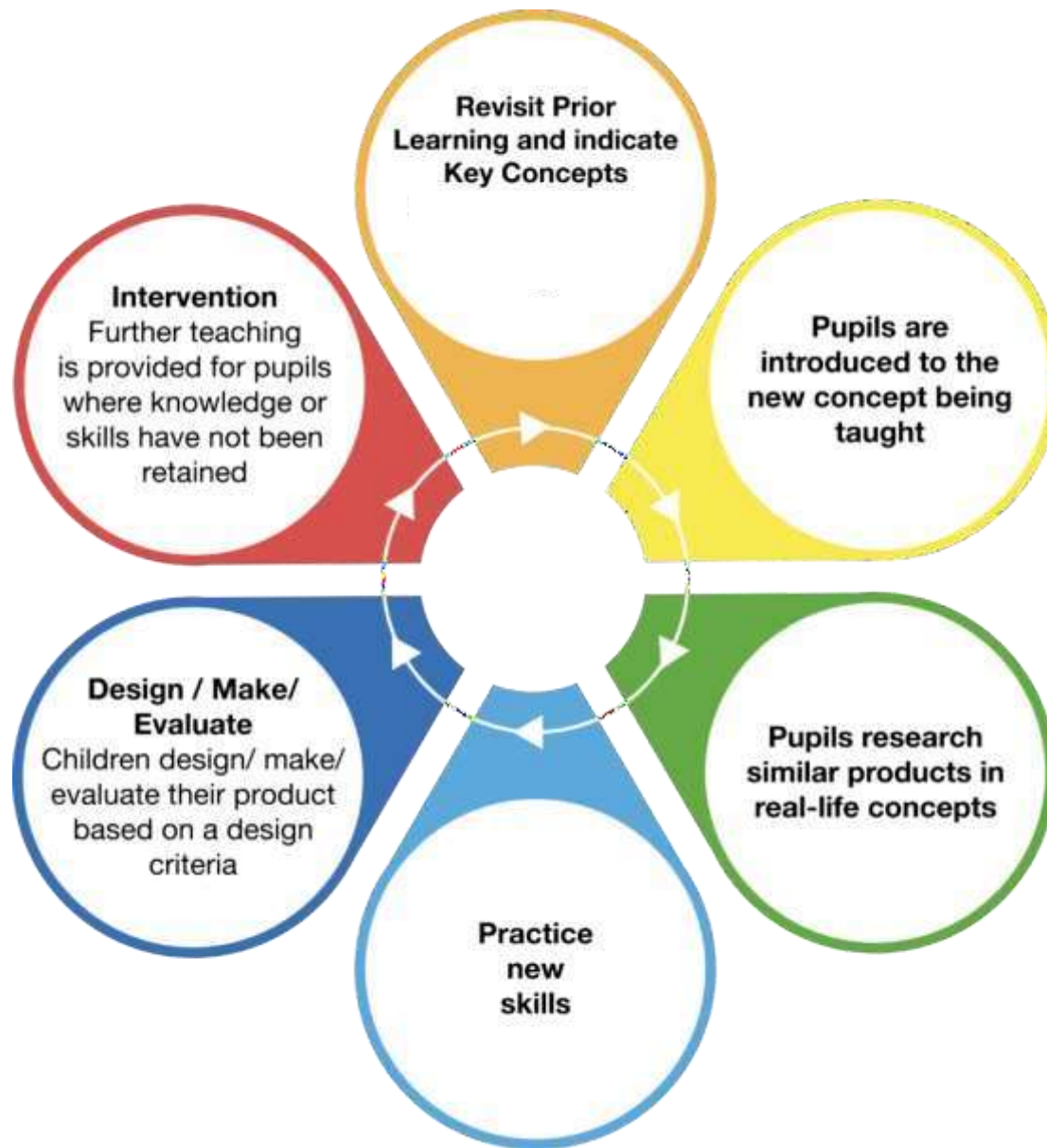
Mechanical systems

Digital world

Structures

A teaching sequence in design and technology:

Each unit of work will be based on the following teaching sequence, adapted to suit the topic:



Early Years Foundation Stage

Expressive Arts and Design Creating with Materials

ELG

- Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.
- Share their creations, explaining the process they have used.
- Make use of props and materials when role playing characters in narratives and stories

The Natural World

ELG

- Explore the natural world around them, making observations and drawing pictures of animals and plants.

In the reception class children have access to a designated art and design area as part of their learning environment which they access during both their adult led time and during continuous provision. Within the adult led time children will be taught the skills they need, and introduced to the tools they need to shape, fix and join materials; choose, select and mix colour; draw, paint and sculpt. When the children are accessing the area within continuous provision, they will be able to use apply the skills and knowledge gained to explore and use the equipment independently. During this time adults will model how to use the resources and support the children as needed.

Children will use learn to effectively use tools such as scissors (with increasing levels of complexity based upon their fine motor skills needs), hole punches, staplers, and tape dispensers. Outside they have access to a wood working area where they will learn to use tools such as palm drills and stubby hammers.

Through adult modelling and interaction, they will learn how to use these tools safely and the importance of doing so.

They will explore different ways to fix and join materials together and through evaluation of their work will be able to make choices over which method or material to use to best suit a purpose. They will have access to glue sticks, PVA glue, sellotape and masking tape, split pins, paper

clips, treasury tags, wool/string/ribbon, staples. Again, adult modelling and interaction will allow the children to understand how to use these resources to best support their work.

The children will have access to a variety of different media such as felt pens, coloured pencils, wax crayons, poster paint and powdered paint. The children will learn the names of the colours and will learn to select colours and resources (thick/thin brushes, crayons for rubbing etc) to best suit their work. They will learn the primary colours and how to mix these to make secondary colours using poster paint and powdered paint.

The children are also taught to use their senses to explore the world around them and will learn basic observation skills to observe an object and then draw it, particularly within the natural world.

The children also have access playdough where they can explore sculpting, rolling, cutting and shaping the dough using rolling pins, cutters and sculpting tools. They will also use clay throughout the year to create some different art work such as diva lamps, animals/dinosaurs, faces etc. The children also mix ingredients to make their own dough.

To support children's work in Art and DT within their provision they will also have access to styles and different colours and sizes of paper and card and tissue paper, junk modelling (recycled packaging materials), stencils, rubbing plates, rubbers, pencil sharpeners, fabric, glitter, sequins, feathers etc.

The children's work is displayed and valued within the learning environment. Evaluation forms part of the learning process and they are encouraged to share and talk about their models and art work.

Impact

Teachers assess children's knowledge, understanding and skills in DT by making observations of the children working during lessons. This formative assessment has a direct impact on the child's progress within a lesson and/or series of lessons. Within a lesson, children are given verbal feedback by the class teacher which enables the child to consider potential changes in approaches to develop their ideas, knowledge and skills. Feedback is also given to the children by their peers through group critique sessions. However, the children are encouraged to be critical of their own work, highlighting their own next steps. Summative assessment takes place by moderating pupils' work in their sketch

books against the DT progression grid, to moderate each child's attainment of knowledge and skills in specific areas of the DT curriculum. Pupil knowledge is also measured through responses to the Key Questions taught. This allows the DT subject leader to measure the impact of the progression map documents, as well as teaching and learning within different year groups. A data drop takes place three times a year to measure pupil progress. Progress on DT is reported to parents three times a year. Our subject leaders also monitor the effectiveness of the art and design curriculum through carrying out regular monitoring evaluations. These evaluations are quality assured by the Curriculum Lead, Senior Leadership and Governors.

Conceptual knowledge

Cycle A	Y1/2	Y3/4	Y5/6
Autumn		Construct a Roman Chariot	Construct an Anderson shelter
Spring	Construct a Windmill	Make a stuffed toy cushion	Make rainforest animals using textiles
Summer	Construct a vehicle using wheels and axles	Create recipes using seasonal, local, produce and understand use of commerce	Create a recipe for dinner on the Titanic

Cycle B	Y1/2	Y3/4	Y5/6
Autumn		Making a slingshot car using mechanical systems	Making an electronic steady-hand game
Spring	Making a food smoothie	Making an electronic poster/torch using electrical systems	Making 3D model volcanoes digitally Cross-stitching and sewing to make an Easter card
Summer	Making a puppet using textiles	Making Egyptian collars using textiles	Making mechanical pop-up books

Year Group	Design
EYFS	I can represent and communicate my ideas through design
1	I am beginning to design products using pictures and words based on a design criteria. I use pictures, words and models to convey what I want to design.
2	I use simple drawings and labels to record my ideas I design products that have a clear purpose based on my own design criteria.
3	I can research similar products to develop my own design ideas. I am able to develop a design through discussion and annotated sketches to add detail to my designs.
4	I generate and develop ideas using exploded diagrams and prototypes. I use different ways to creatively record and present my designs to show they are fit for purpose.
5	I can generate and develop ideas using pattern pieces and computer aided design.
6	I generate and develop ideas using a variety of design techniques. I justify my plans in a convincing way. I use research and develop design criteria to design innovative functional and appealing products aimed at a specific group.

Year Group	Make
EYFS	I can safely use tools and materials I can choose materials which would be good to make things with
1	I can choose appropriate resources and tools to make a product. I can use a range of materials to make a product, including construction materials, textiles and ingredients.
2	I can select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] I use a range of materials to make a product, including construction materials, textiles and ingredients and explain why the materials have been selected.
3	I can choose a material for both its suitability and its appearance and explain why it has been selected. I can think ahead about the order of my work, select tools needed for a given task and give reasons for my choices.

4	I can choose and use appropriate tools from a wider range to perform practical tasks.
	I can choose suitable materials from a wider range and explain its suitability.
5	I use a range of appropriate tools competently.
	I can join and combine a range of materials competently.
6	I select and use specialist tools and equipment to perform practical tasks accurately.
	I can select from and use a wider range of materials and components according to their functional qualities and aesthetic qualities.

Year Group	Evaluate
EYFS	I can say what I like or don't like about what I have made
1	I am beginning to explore and evaluate a range of existing products by evaluating the product against the purpose
	I can evaluate my designs and products by saying how well they do the job they were designed for.
2	I can explore and evaluate a range of existing products by looking at function and materials.
	I can evaluate my ideas and products against set design criteria.
3	I can investigate and analyse an existing product by identifying whether it is fit for purpose and how easy it is to use.
	I can prove that my design meets some set criteria and evaluate how well it works.
4	I can explain why certain materials were used to make existing products
	I can evaluate and suggest improvements for my design.
5	I can evaluate appearance and function against original criteria.
	I am able to justify decisions made during the design process.
6	I can critically evaluate the quality of the design, manufacture and fitness for purpose by comparing existing products
	I can evaluate my ideas and products against my own design criteria and consider the views of others to improve my work.

Year group	Technical knowledge
EYFS	I can use some appropriate words to talk about my ideas or products
1	I can explore and use simple mechanisms in my products.
2	I can build structures, exploring how they can be made stronger, stiffer and more stable.
3	I can apply my understanding of how to strengthen, stiffen and reinforce more complex structures.
4	I am able to understand and use mechanical systems in my products.

5	I can understand and use electrical systems in my products.
6	I am able control and model using an ICT control programme.

Year group	Cooking and nutrition
EYFS	I know some foods that are healthy and good for me
1	I can tell you where my food comes from
2	I can use a range of ingredients to prepare a healthy dish
3/4	I can make healthy eating choices from an understanding of a balanced diet
	I can use a range of ingredients to prepare a healthy dish, explain why the ingredients were chosen and the effects on the body
	I can use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading or kneading
5/6	I can explore a range of cooking of cooking techniques to produce a healthy balanced dish.
	I can measure out ingredients accurately and use ratios to scale up or scale down a recipe
	I understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.
	I understand the importance of correct storage and handling of ingredients

DT vocabulary

Reception

Card, design, crayons, paints, pencils, pens, stencil, fold, pattern, landscape portrait, recipe, laminate, lollipop sticks, magnet, masking tape, metal, paper clip, plastic, wood, decoration, bake, knead, set, join, measuring jug, mixing bowl, ruler, scales, scissors, weaving

Year 1 and 2

Card, bar chart, design, wool, decoration, bake, knead, rub in, knives, laminating, mixing bowl, ruler, scales, scissors.

Year 3 and 4

Cross section, annotated diagram, design, plan, research.

Annotated diagram, appearance, artefact, brittle, cross-section, design, design brief, dismantle, drawing tools, crayons, marker pens, paints, pastels pencils, pens, compass, protractor, stencil, enlarged view, evaluation, function, plan, planning, portrait, primary source, recipe, research, adhesive, art straws, battery, battery snaps aka crocodile clips, bulb, bulb holder, buzzer, wire, decoration, bake, baste, beat, oil, dice, glaze, mixing bowl, motion, linear, machine, mechanism.

Year 5 and 6

Annotated diagram, design process, design proposal, final design, research.

Aesthetics, annotated diagram, appearance, artefact, card, bar chart, flow chart, pie chart, cross section, design, design process, design proposal, crayons, marker pens, paints, pastels pencils, pens, compass, protractor, stencil, equipment, evaluation, final design, flexible, fold, graphics, pattern, performance, perspective drawing, pictogram, plan, planning, portrait, questionnaire, recipe, research, rigid, adhesive, aluminium, art straws, axle, balsa batter, cam, chassis, hardwood, lollipop magnet, masking tape, metal, plastic, wheel, wood, saw, bake, beat, boil, dice, food preparation, junior hacksaw, laminating, measuring jug, measuring spoon, mixing bowl, saw, scale, scissors, scoring, sewing terms, back-stitch, blanket stitch, cross stitch, running stitch, tacking stitch, tie and dye, weaving.