Westfields JUNIOR SCHOOL

# Design & Technology Curriculum
# Progression of Skills and Knowledge


Design & Technology (D&T) provides children with the opportunity to become engineers, designers and inventors of the future. At Westfields Junior School, our D&T curriculum encourages children to develop skills of creativity, problem solving and evaluation whilst also promoting independence and team work. We are providing them with the skills to handle a rapidly changing world and to also be curious about the world around them.

Our planned termly topics identify a clear purpose for designing and creating future products as well as make links to other curriculum areas. Through sequential lessons, children will be equipped with the ability to identify issues with products as well as the needs of a consumer. Consequently, they will use this knowledge to support their product development and subsequent creation. Through the study of D&T, learning combines practical skills with an understanding of aesthetic, social and environmental issues, as well as functions and industry. This allows them to evaluate past and present technology, its uses and impact.

## The National Curriculum for Design & Technology

### Years 3 - 6

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]. When designing and making, pupils should be 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 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**

As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.

Pupils should be taught to:

- 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.

| SKILLS | Progression of Skills | | | |
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| | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Designing** | • Draw on technical knowledge to suggest their own success criteria and use this to help them create a suitable idea.<br>• Select a final design with a specific audience/need in mind and explain why this is the most suitable one.<br>• Draw simple sketches and label parts with relevant technical language e.g. when designing moving vehicles and greetings card.<br>• Explain how particular parts of their product will work e.g. when designing the lever and linkage for their greetings card. | • Create a suitable success criteria.<br>• Generate a range of suitable ideas, selecting the best for the specific audience/need and the one they think will be most suitable.<br>• Draw more technical drawings including the measurements of final designs with labelled relevant technical knowledge e.g. when designing an Easter decoration.<br>• Use technical vocabulary to explain how their product will work, applying any technical knowledge e.g. when making a warning system. | • Use research to develop designs that are innovative, functional and appealing aimed at a specific individual or group.<br>• Create prototypes to adapt design flaws e.g. when making the Cams project.<br>• Draw 3D final designs (where relevant) with relevant measurements and annotated technical knowledge e.g. when. Designing the Cams project.<br>• Use technical vocabulary to explain how their product will work applying any technical knowledge e.g. when designing the Cams project. | • Use market research to inform, generate and develop designs for a specific individual, group or purpose e.g. during the creation of pies and when designing pulley systems.<br>• Make modifications to initial ideas using prototypes and feedback.<br>• Draw 3D final designs using computer aided software with annotations, measurements and materials e.g. when designing an emergency shelter and a pulley system.<br>• Use technical vocabulary to explain how their product will work applying any technical knowledge. |
| **Making** | • Specify what tools they will need and the order in which they will need to make their final product e.g. when making the moving vehicle and when making sushi.<br>• Start to work safely with a range of simple tools to measure, mark, cut and assemble with increasing accuracy e.g. when. using bench hooks and junior hacksaws in the moving vehicle project.<br>• Use finishing techniques to strengthen and improve the | • Select and use appropriate tools in a logical order.<br>• Create risk assessments to ensure they are using a range of tools safely to measure, mark, cut, join and finish accurately e.g. when creating a warning system.<br>• Use finishing techniques to strengthen a final product and apply art knowledge/skills/ techniques to improve the overall appearance e.g. when making a Easter decoration. | • Select from a wider range of tools to cut, mark, score, measure and finish precisely.<br>• Pin, sew and stitch materials together with confidence to create a product.<br>• Use a range of finishing techniques to strengthen, stiffen and reinforce, and create a finished product that is a suitable scale and fit for purpose.<br>• Select materials which are most suitable for appealing aesthetics | • Select from a wider range of tools to cut and join with accuracy to ensure a high-quality finish to his/her product e.g. when creating an emergency shelter and pulley system.<br>• Accurately apply a range of finishing techniques, including those from art and design.<br>• Plan the order of their work, choosing appropriate materials, tools and techniques e.g. when |

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| | appearance of their final product. | | e.g. when creating cushion covers.<br>• Apply technical knowledge to ensure the final product is functional. | creating an emergency shelter, pie and pulley system.<br>• Aim to make and to achieve a quality product e.g. when making pies.<br>• Construct products using permanent joining techniques. |
| **Evaluating** | • Investigate similar products to the ones they will be making, suggesting how they work (excluding cooking), what materials have been used and how it might have been made.<br>• Refer to their success criteria and identify successes and improvements that could be made. | • Use existing products as a starting point for their own designs, looking at colour, materials, steps to making it and how well the design meets the purpose e.g. when developing and creating an Easter decoration.<br>• Refer to a success criterion to identify successes and improvements and self-assess as to how they have met the needs of the audience. | • Start to evaluate a product against the original design specification e.g. when baking bread and cushion covers.<br>• Evaluate their work both during and at the end of the assignment.<br>• Begin to evaluate final pieces personally and seek evaluation from others. | • Suggest alternative methods of making if the first attempts fail.<br>• Identify the strengths and areas for development in their ideas and products. |
| **Cooking and nutrition** | • Identify how they will be hygienic when measuring, weighing and cooking ingredients appropriately.<br>• Use the techniques of chopping and rolling when making sushi. | • Recognise that a healthy diet is made up from variety and balance, using vocabulary from 'The Eatwell Plate'.<br>• Recognise where foods come from and how they are used as ingredients e.g. when creating a Greek Salad.<br>• Use the techniques of chopping and slicing. | • Recognise the process of basic ingredients from farm to plate.<br>• Taste and evaluate a range of breads to develop vocabulary to aid designing.<br>• Use the techniques of kneading and spreading. | • Identify the different food groups and why we need them.<br>• Read label information, especially to determine specific allergies.<br>• Use the techniques of beating, mixing, chopping, kneading and baking. |

| **KNOWLEDGE** | **Progression of Knowledge** | | | |
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| | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Technical knowledge** | • Know about and specify inventors/designers/ engineers/manufacturers who have developed ground-breaking or popular products e.g. Henry Ford when creating moving vehicles.<br>• Know about and explain how levers, linkages, pivots, wheels and axles work. | • Know about and specify famous designers who have developed a ground-breaking or popular product e.g. Laura Ashley.<br>• Know about and recognise that a single fabric can make a textile product using templates.<br>• Know about and explain how electrical systems are used in their products e.g. in the warning system project. | • Know about and specify famous designers who have developed a ground-breaking or popular product e.g. Warburtons.<br>• Know about and explain how a Cam works and identify where they are used in real-life.<br>• Know which stitch is best for joining fabrics in different ways and know how to add embellishments. | • Know how to reinforce and strengthen a 3D framework e.g. WW2 shelters and pulley systems.<br>• Know and understand how a pulley system works and how it can be controlled through computer aids. |

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| **Cooking and nutrition** | • Know how they will be hygienic when measuring, weighing and cooking ingredients appropriately. | • Know that a healthy diet is made up from variety and balance, using vocabulary from 'The Eatwell Plate'.<br>• Know where foods come from and how they are used as ingredients e.g. when creating a Greek Salad. | • Know the process of basic ingredients from farm to plate.<br>• Know how to prepare and cook dishes safely and hygienically including, where appropriate, the use of a heat source.<br>• Know about and understand how food is processed into ingredients that can be eaten or used in cooking. | • Know the different food groups and understand why we need them.<br>• Know how to prepare and cook dishes safely and hygienically including, where appropriate, the use of a heat source.<br>• Know about and understand that seasons may affect the food available. |