



### **Design & Technology Statement of Intent**

At Zetland, our Design Technology curriculum aims to develop creativity, problem solving and innovation through the design, manufacture and evaluation of functional and useful products for the modern world. It combines skills from maths, science, computing and art to develop pupils who are resourceful, innovative and considerate of their surroundings. The Design Technology curriculum is organised into five areas: Mechanisms, Structures, Textiles, Electrical Systems and Food. From moon buggies to fruit kebabs and South American food to electrical board games, the children work on three *design, make and evaluate projects* in each year group. Each project starts with an evaluation and critique of current products, technology and processes. The pupils learn the practical skills they will need such as cutting dowels, chopping fruit or reinforcing frames before undertaking the design, construction and evaluation of their project. Usually their project will be guided by a set of design criteria that they aim to meet.

#### **Food**

Food technology is taught in every year group. Our youngest children learn to prepare and combine ingredients to produce uncooked dishes such as fruit kebabs. As the children get older they use these skills in more complex projects involving melting, heating and baking.

Alongside the design, make and evaluate projects, children will make connections to staying healthy, hygiene and the packaging and marketing of food products. They will learn where our ingredients come from and our responsibilities to farm sustainably.

### **EYFS Statement relating to DT**

Design Technology has an important role to play in the Early Years curriculum and is evident in the different areas of both the Reception and Nursery classrooms. The building and outdoor areas both provide opportunities for children to begin to develop the skills, knowledge and vocabulary they will use in Design Technology lessons throughout their primary phase. A dedicated DT area with tools and materials available for the children is also vital to ensuring a successful start to their lives as future engineers, designers and manufacturers.

In the new Statutory Framework for EYFS, the prime area of Physical development refers to the development of fine motor skills and hand-eye coordination through using small tools. DT can also support the specific area of Mathematics, particularly the development of children's spatial reasoning. Through the Understanding the World area, children will develop understanding of technology and in the area of Expressive Arts and Design, children will begin to engage in materials and media they will use throughout their school life. They will begin to communicate through the arts and start to show self-expression, making choices about what they like and don't like – leading to an understanding of themselves as a 'user'.

Year group/term	Year 1 Project 1	Year 1 Project 2	Year 1 Project 3
Learning Topic	Mechanism – Sliders & Levers	Freestanding Structures	Food – Preparing Fruit
<b>Key knowledge and skills to be secured</b>	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Know &amp; understand the term ‘design’</li> <li>• Generate ideas based on simple design criteria and their own experiences, explaining what they could make.</li> <li>• Develop, model and communicate their ideas through drawings and mock-ups with card and paper.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Plan by suggesting what to do next.</li> <li>• Select and use tools, explaining their choices, to cut, shape and join paper and card.</li> <li>• Use simple finishing techniques suitable for the product they are creating.</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>• Explore a range of existing books and everyday products that use simple sliders and levers.</li> <li>• Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets design criteria.</li> </ul> <p>Mechanisms</p> <ul style="list-style-type: none"> <li>• Know the terms: slider, lever, pivot</li> <li>• Create a lever using a card strip and a paper fastener as a pivot.</li> <li>• Create a slider using a card strip and a guide</li> </ul>	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• To know the difference between natural and manufactured (man-made)</li> <li>• Know &amp; understand the term ‘design’</li> <li>• To generate ideas to solve problems using resources they are familiar with, to talk about their ideas and to draw them.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Plan by suggesting what to do next.</li> <li>• Select and use tools, skills and techniques, explaining their choices.</li> <li>• Select new and reclaimed materials and construction kits to build their structures.</li> <li>• Use simple finishing techniques suitable for the structure they are creating.</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>• To say whether or not their ideas have or haven’t worked.</li> </ul> <p><b>Structures</b></p> <ul style="list-style-type: none"> <li>• To know that structures are more stable when the base is wide or heavy.</li> <li>• Explore a range of existing freestanding structures in the school and local environment e.g. everyday products and buildings.</li> </ul>	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Design appealing products for a particular user based on simple design criteria.</li> <li>• Generate initial ideas and design criteria through investigating a variety of fruit and vegetables.</li> <li>• Communicate these ideas through talk and drawings.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely.</li> <li>• Select from a range of fruit and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product.</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>• Taste and evaluate a range of fruit and vegetables to determine the intended user’s preferences.</li> <li>• Evaluate ideas and finished products against design criteria, including intended user and purpose.</li> </ul> <p>Food</p> <ul style="list-style-type: none"> <li>• Understand where a range of fruit and vegetables come from e.g. farmed or grown at home.</li> <li>• To know that some foods are healthy and others aren’t always</li> <li>• To cut using a vegetable knife using a bridge grip</li> </ul>

Year group/term	Year 2 Project 1	Year 2 Project 2	Year 2 Project 3
Learning Topic	Food – preparing vegetables	Textiles – fabric decoration	Mechanism- wheels & axels
<p><b>Key knowledge and skills to be secured</b></p>	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• To know the terms ‘design brief’ and ‘design criteria’</li> <li>• use simple design criteria; state what their products are, who and what they are for and how they will work.</li> <li>• generate ideas using their own experiences and existing products; use talk, drawing, templates, mock-ups and, where appropriate, computers</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely.</li> <li>• Select from a range of fruit and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product.</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>• To say whether or not their ideas have worked well or not giving reasons for their answers. To understand that others may evaluate their work differently.</li> </ul> <p><b>Food</b></p> <ul style="list-style-type: none"> <li>• To know that some food comes from farms, caught in the sea and some can be home grown</li> <li>• To know that we should eat 5 portions for fruit or vegetables a day</li> </ul> <p>To slice using a vegetable knife using a ‘fork secure’ grip</p>	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Design a functional and appealing product for a chosen user and purpose based on simple design criteria.</li> <li>• Generate, develop, model and communicate their ideas as appropriate through talking, drawing, templates, mock-ups and information and communication technology.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Select from and use a range of tools and equipment to perform practical tasks such as marking out, cutting, joining and finishing.</li> <li>• Select from and use textiles according to their characteristics.</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>• To say whether or not their ideas have worked well or not giving reasons for their answers.</li> </ul> <p><b>Textile</b></p> <ul style="list-style-type: none"> <li>• Know the terms: fabric, sew, stitch, template</li> <li>• To recognise the following tools and say what each is used for – needle, pin, safety pin</li> <li>• To use a template to duplicate a part</li> <li>• To sew using a running stitch</li> <li>• Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons.</li> </ul>	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• To know the terms ‘design brief’</li> <li>• state what their products are, who and what they are for and how they will work.</li> <li>• generate ideas using their own experiences and existing products; use talk, drawing, templates, mock-ups and, where appropriate, computers</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Select from and use a range of tools and equipment to perform practical tasks such as cutting and joining to allow movement and finishing.</li> <li>• Select from and use a range of materials and components such as paper, card, plastic and wood according to their characteristics.</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>• To say whether or not their ideas have worked well or not giving reasons for their answers.</li> <li>• Explore and evaluate a range of products with wheels and axels.</li> </ul> <p><b>Mechanism</b></p> <ul style="list-style-type: none"> <li>• Know the terms: wheel, axle, axle holder</li> <li>• Explore and use wheels, axles and axle holders.</li> <li>• Distinguish between fixed and freely moving axles.</li> <li>• To know the terms ‘design brief’ and ‘design criteria’</li> <li>• use simple design criteria; state what their products are, who and what they are for and how they will work.</li> <li>• generate ideas using their own experiences and existing products; use talk, drawing, templates, mock-ups and, where appropriate, computers</li> </ul>

Year group/term	Year 3 Project 1	Year 3 Project 2	Year 3 Project 3
Learning Topic	Mechanisms – levers & linkages	Structures – pneumatics	Food – healthy & varied diet
<b>Key knowledge and skills to be secured</b>	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>gather information about user needs; describe the user, purpose and design features of their products and explain how they will work.</li> <li>generate realistic ideas based on user needs; use a range of drawing skills, prototypes, and computer-aided design.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>Order the main stages of making.</li> <li>Select from and use appropriate tools with some accuracy to cut, shape and join paper and card.</li> <li>Select from and use finishing techniques suitable for the product they are creating.</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>Investigate and analyse books and, where available, other products with lever and linkage mechanisms.</li> <li>Evaluate their own products and ideas against criteria and user needs, as they design and make.</li> </ul> <p><b>Mechanism</b></p> <ul style="list-style-type: none"> <li>Understand and use lever and linkage mechanisms.</li> <li>Distinguish between fixed and loose pivots.</li> <li>Know and use technical vocabulary relevant to the project.</li> </ul>	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and the functional and aesthetic purposes of the product.</li> <li>Develop ideas through the analysis of existing shell structures and use computer-aided design to model and communicate ideas.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>Plan the order of the main stages of making.</li> <li>Select and use appropriate tools and software to measure, mark out, cut, score, shape and assemble with some accuracy.</li> <li>Explain their choice of materials according to functional properties and aesthetic qualities.</li> <li>Use computer-generated finishing techniques suitable for the product they are creating.</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>Investigate and evaluate a range of shell structures including the materials, components and techniques that have been used.</li> <li>Test and evaluate their own products against design criteria and the intended user and purpose.</li> </ul> <p><b>Structures</b></p> <ul style="list-style-type: none"> <li>Know the terms: scoring, tabs</li> <li>To score a line accurately with a ruler and tool</li> <li>To stiffen a flat piece of material using laminating, ribbing and corrugating</li> </ul>	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>Generate and clarify ideas through discussion with peers and adults to develop design criteria including appearance, taste, texture and aroma for an appealing product for a particular user and purpose.</li> <li>Use annotated sketches and appropriate information and communication technology, such as web-based recipes, to develop and communicate ideas.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>Plan the main stages of a recipe, listing ingredients, utensils and equipment.</li> <li>Select and use appropriate utensils and equipment to prepare and combine ingredients.</li> <li>Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics.</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs.</li> <li>Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.</li> </ul> <p><b>Food</b></p> <ul style="list-style-type: none"> <li>To identify healthy and potentially unhealthy ingredients.</li> <li>Know how to use appropriate equipment and utensils to prepare and combine food.</li> <li>To slice using a vegetable knife and a claw grip</li> </ul>

Year group/term	Year 4 Project 1	Year 4 Project 2	Year 4 Project 3
Learning Topic	Food – healthy & varied diet	Electrical Systems – electric boardgame	Textiles – 2d shape to 3d product
<b>Key knowledge and skills to be secured</b>	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>gather information about user needs; develop their own design criteria; describe the user, purpose and design features of their products and explain how they will work.</li> <li>generate realistic ideas based on user needs; use a range of drawing skills, prototypes, and computer-aided design.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>order the main stages of making including any that are critical (one that subsequent stages cannot be started before it is complete)</li> <li>Begin to devise their own procedures for safety and hygiene;</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>evaluate their ideas and products against their design criteria.</li> <li>compare how well two products have been designed and made</li> <li>To know some healthy alternatives to popular sweets and drinks</li> <li>To warm and melt ingredients safely using a heat source</li> </ul>	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>gather information about user needs; develop their own design criteria; describe the user, purpose and design features of their products and explain how they will work.</li> <li>generate realistic ideas based on user needs; use a range of drawing skills, prototypes, and computer-aided design.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>order the main stages of making including any that are critical (one that subsequent stages cannot be started before it is complete)</li> <li>Begin to devise their own procedures for safety and hygiene;</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>evaluate their ideas and products against their design criteria.</li> <li>compare how well two products have been designed and made</li> </ul> <p><b>Electrical Systems</b></p> <ul style="list-style-type: none"> <li>To make a variety of simple switches using classroom materials</li> <li>To include a switch in their finished product</li> <li>To include a circuit diagram in their design</li> </ul>	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s.</li> <li>Produce annotated sketches, prototypes, final product sketches and pattern pieces.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>Plan the main stages of making.</li> <li>Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing.</li> <li>Select fabrics and fastenings according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern.</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>Investigate a range of 3-D textile products relevant to the project.</li> <li>Test their product against the original design criteria and with the intended user.</li> <li>Take into account others' views.</li> <li>Understand how a key event/individual has influenced the development of the chosen product and/or fabric.</li> </ul>

Year group/term	Year 5 Project 1	Year 5 Project 2	Year 5 Project 3
Learning Topic	Mechanisms - cams	Food – celebrating culture	Structures – frame structure
Key knowledge and skills to be secured	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources.</li> <li>• Develop a simple design specification to guide their thinking.</li> <li>• Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team.</li> <li>• Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished. Work within the constraints of time, resources and cost.</li> </ul> <p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>• Compare the final product to the original design specification.</li> <li>• Test products with the intended user, where safe and practical, and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose.</li> <li>• Consider the views of others to improve their work.</li> <li>• Investigate famous manufacturing and engineering companies relevant to the project.</li> </ul>	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• To plan an information gathering exercise to collect data on the user.</li> <li>• To generate innovative ideas using information collected</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Write a step-by-step recipe, including a list of ingredients, equipment and utensils</li> <li>• Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients.</li> <li>• Make, decorate and present the food product appropriately for the intended user and purpose.</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>• Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations using e.g. tables/graphs/charts such as star diagrams.</li> <li>• Evaluate the final product with reference back to the design brief and design specification, considering the views of others when identifying improvements.</li> <li>• Understand how key chefs have influenced eating habits to promote varied and healthy diets.</li> </ul> <p><b>Food</b></p> <ul style="list-style-type: none"> <li>• To understand the seasonal nature of food and its availability and how modern production can negate this.</li> <li>• To know that cooking ingredients can change their taste, texture and use</li> <li>• To know how to use an oven safely including using an oven glove.</li> </ul>	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• To plan an information gathering exercise to collect data on the user.</li> <li>• To know that they can decide on their own design criteria for a product.</li> <li>• To generate innovative ideas using information collected using accurate labelled drawings, prototypes and computer-aided design</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Begin to formulate lists of resources and equipment and create step-by-step plans; select suitable tools, equipment, materials and components and explain their choices.</li> <li>• To devise and follow procedures for safety and hygiene</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>• To make realistic judgements about the products they make in relation to the design brief.</li> <li>• To suggest ways that their designs could be improved and the effect this would have on the user.</li> </ul> <p><b>Structures</b></p> <ul style="list-style-type: none"> <li>• To know the following terms Frame, reinforce, triangulation</li> <li>• To reinforce a 'but' joint using card triangles To reinforce square frames using triangulation</li> </ul>

Year group/term	Year 6 Project 1	Year 6 Project 2	Year 6 Project 3
Learning Topic	Electrical systems & Levers and Pulleys	Textiles – using CAD	Food – home baking
Key knowledge and skills to be secured	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources.</li> <li>• Develop a simple design specification to guide their thinking.</li> <li>• Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team.</li> <li>• Select from and use a range of tools and equipment to make products that are accurately assembled and well finished. Work within the constraints of time, resources and cost.</li> </ul> <p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>• Compare the final product to the original design specification.</li> <li>• Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose.</li> <li>• Consider the views of others to improve their work.</li> <li>• Investigate famous manufacturing and engineering companies relevant to the project.</li> </ul>	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Generate innovative ideas through research including surveys, interviews and questionnaires.</li> <li>• Develop, model and communicate ideas through talking, drawing, templates, mock-ups and prototypes including using computer-aided design.</li> <li>• Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Produce detailed lists of equipment and fabrics relevant to their tasks.</li> <li>• Formulate step-by-step plans and, if appropriate, allocate tasks within a team.</li> <li>• Select from and use a range of tools and equipment, including CAD, to make products that are accurately assembled and well finished. Work within the constraints of time, resources and cost.</li> </ul> <p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>• Investigate and analyse textile products linked to their final product.</li> <li>• Compare the final product to the original design specification.</li> <li>• Test products with intended user, where safe and practical, and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose.</li> <li>• Consider the views of others to improve their work.</li> </ul> <p><b>Textiles</b></p> <ul style="list-style-type: none"> <li>• To know how fabric is strengthened</li> <li>• To fasten pieces together temporarily using a large running stitch (tack)</li> <li>• To use embroidery to decorate fabric.</li> </ul>	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• carry out research; develop a simple design specification; describe the user, purpose and design features of their products and explain how they will work.</li> <li>• generate innovative ideas drawing on research</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• formulate lists of resources and detailed step-by-step plans; select suitable tools, equipment, materials and components and explain their choices.</li> <li>• To devise and follow procedures for safety and hygiene; use a wider range of materials and components; measure, mark out, cut, shape, assemble, join, combine and finish with accuracy.</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>• identify strengths and areas to develop in their ideas and products against their design specification; consider the views of others to make improvements.</li> </ul> <p><b>Food</b></p> <ul style="list-style-type: none"> <li>• To understand the processing of ingredients such as flour from wheat</li> <li>• To know that some ingredients can be unhealthy for people with food allergies</li> <li>• To rub in flour and knead dough</li> </ul>

