

### **Curriculum Plans**

### "Design is not just what it looks like and feels like. Design is how it works." Steve Jobs, Co-founder Apple Inc

### Intent

Our Design Technology curriculum has been carefully planned and designed to encompass the content of the National Curriculum and ensure that it reflects and is distinct to our locality.

- Pupils' design technology education begins in the early years and builds year on year, developing pupils' expertise.
- Curriculum plans have been constructed effectively to ensure that pupils know more, remember more and are able to do more.
- Golden Threads, based on the four key strands as well as cooking and nutrition have been identified for each year group and underpin the key knowledge and concepts taught through our curriculum.
- Key knowledge has been mapped out from the early years to the end of KS2 to ensure that that the curriculum is coherently sequenced and there is clear progression.
- The organisation of the curriculum builds knowledge so that pupils can draw on it in future learning.
- Vocabulary has been identified and outlined clearly so that this can be taught explicitly within lessons.
- Clearly defined end points have been identified to ensure that pupils build upon prior learning and develop their knowledge of key concepts.
- Pupils commit knowledge to their long-term memory through recalling and repeated practice outlined in plans.

### Implementation

Within and beyond our classrooms we provide a range of opportunities and implement a range of teaching methods to ensure that over the course of study, teaching is designed to help learners to remember in the long term the content they have been taught and to integrate new knowledge into larger concepts.

- Knowledge organisers which outline knowledge (including vocabulary) all children must master and apply in lessons are introduced at the start and referred to throughout a unit of study.
- A well sequenced cycle of lessons carefully plans for progression and depth concentrating on design technology knowledge and skills suited to the age group.
- Lessons follow a consistent structure of: retrieval, explanation, application and assessment which may include such features as questioning, modelling, individual, partner, group or whole class activities.
- Enrichment activities/visits are carefully used where appropriate to ensure pupils are able to practise and apply their knowledge and skills.
- Our inclusive approach is demonstrated through the way in which tasks and activities are adapted to ensure that all pupils are able to access the curriculum.
- Through retrieval, teachers make sure that pupils can draw on what they already know so that they can remember more.
- Key vocabulary is explicitly taught to enable pupils to develop their range of design technology vocabulary and understanding.
- Assessment for learning strategies are used at the start, during and at the end of lessons to assess pupils' learning and identify any gaps or misconceptions.

### Impact

- Our Design Curriculum is high quality, well thought out and is planned to demonstrate progression. If children are keeping up with the curriculum, they are deemed to be making good or better progress. In addition, we measure the impact of our curriculum through the following methods:
  - Pre and post unit assessments
  - Assessment against 'End of Year Expectations' with clearly identified end points. These are then passed to the receiving teacher to ensure any gaps can be addressed when a key concept is revisited.



GOLDEN THREADS	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>THREADSDesigning</b> EAD: Creating with materials Safely use and explore a variety of 		Understanding Contexts, Users and Purposes         Across KS2 pupils should:         • work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment         • describe the purpose of their products         • indicate the design features of their products that will appeal to intended users         • explain how particular parts of their products work         In early KS2 pupils should also:         • gather information about the needs and wants of individuals and groups         • develop their own design criteria and use these to inform their ideas         In late KS2 pupils should also:         • carry out research, using surveys, interviews, questionnaires and web-based resources         • identify the needs, wants, preferences and values of individuals and groups         • develop a simple design specification to guide their thinking					
	<ul> <li>Generating, Developing, Modelling and Communicating Ideas</li> <li>Across KS1 pupils should:         <ul> <li>generate ideas by drawing on their own experiences</li> <li>use knowledge of existing products to help come up with ideas</li> <li>develop and communicate ideas by talking and drawing</li> <li>model ideas by exploring materials, components and construction kits and by making templates and mock- ups</li> <li>use information and communication technology, where appropriate, to develop and communicate their ideas</li> </ul> </li> </ul>		<ul> <li>generate realistic ideas, focusing on the needs of the user</li> <li>make design decisions that take account of the availability of resources</li> <li>In late KS2 pupils should also:         <ul> <li>generate innovative ideas, drawing on research</li> <li>make design decisions, taking account of constraints such as time, resources and cost</li> </ul> </li> </ul>				
Making	EAD: Creating with materials Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Share their creations,	Planning Across KS1 pupils should: • plan by suggesting what to do next		Planning         Across KS2 pupils should:         • select tools and equipment suitable for the task         • explain their choice of tools and equipment in relation to skills and techniques they will be using         • select materials and components suitable for the task         • explain their choice of materials and components according to functional properties and aesthetic qualities         In early KS2 pupils should also:         • order the main stages of making         In late KS2 pupils should also:         • produce appropriate lists of tools, equipment and materials that they need         • formulate step-by-step plans as a guide to making			unctional properties and



	explaining the process they have used. <u>PD: Fine motor</u> Use a range of small tools, including scissors, paintbrushes and cutlery.	<ul> <li>Practical Skills and Techniques</li> <li>Across KS1 pupils should: <ul> <li>follow procedures for safety and hygiene</li> <li>use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components</li> <li>measure, mark out, cut and shape materials and components</li> <li>assemble, join and combine materials and components</li> <li>use finishing techniques, including those from art and design</li> </ul> </li> </ul>	<ul> <li>Practical Skills and Techniques</li> <li>Across KS2 pupils should: <ul> <li>follow procedures for safety and hygiene</li> <li>use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components</li> <li>In early KS2 pupils should also: <ul> <li>measure, mark out, cut and shape materials and components with some accuracy</li> <li>assemble, join and combine materials and components with some accuracy</li> <li>apply a range of finishing techniques, including those from art and design, with some accuracy</li> </ul> </li> <li>In tec KS2 pupils should also: <ul> <li>accurately measure, mark out, cut and shape materials and components</li> <li>accurately assemble, join and combine materials and components</li> <li>accurately apply a range of finishing techniques, including those from art and design</li> <li>use techniques that involve a number of steps</li> <li>demonstrate resourcefulness when tackling practical problems</li> </ul> </li> </ul></li></ul>
Evaluating Products	EAD: Creating with materials Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Share their creations,	<ul> <li>Own Ideas and Products</li> <li>Across KS1 pupils should: <ul> <li>talk about their design ideas and what they are making</li> <li>make simple judgements about their products and ideas against design criteria</li> <li>suggest how their products could be improved</li> </ul> </li> </ul>	Own Ideas and Products         Across KS2 pupils should:         identify the strengths and areas for development in their ideas and products         consider the views of others, including intended users, to improve their work         In early KS2 pupils should also:         refer to their design criteria as they design and make         use their design criteria to evaluate their completed products         In late KS2 pupils should also:         critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make         evaluate their ideas and products against their original design specification
	explaining the process they have used.	Existing Products Across KS1 pupils should explore: • what products are • who products are for • what products are for • how products work • how products are used • where products might be used • what materials products are made from • what they like and dislike about products	Existing Products Across KS2 pupils should investigate and analyse: <ul> <li>how well products have been designed</li> <li>how well products have been made</li> <li>why materials have been chosen</li> <li>what methods of construction have been used</li> <li>how well products work</li> <li>how well products achieve their purposes</li> <li>how well products meet user needs and wants</li> </ul> <li>In early KS2 pupils should also investigate and analyse:         <ul> <li>who designed and made the products</li> <li>where products were designed and made</li> <li>where products can be recycled or reused</li> </ul> </li> <li>In late KS2 pupils should also investigate and analyse:         <ul> <li>how much products cost to make</li> <li>how much products cost to make</li> <li>how much products cost to make</li> <li>how sustainable the materials in products are</li> <li>what impact products have beyond their intended purpose</li> </ul> </li>



			<ul> <li>Key Events and Individuals</li> <li>Across KS2 pupils should know:</li> <li>about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products</li> </ul>
Technical Knowledge	EAD: Creating with materials 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.	<ul> <li>Making Products Work Across KS1 pupils should know: <ul> <li>about the simple working characteristics of materials and components</li> <li>about the movement of simple mechanisms such as levers, sliders, wheels and axles <ul> <li>how freestanding structures can be made stronger, stiffer and more stable</li> <li>that a 3-D textiles product can be assembled from two identical fabric shapes</li> <li>that food ingredients should be combined according to their sensory characteristics</li> <li>the correct technical vocabulary for the projects they are undertaking</li> </ul> </li> </ul></li></ul>	Making Products Work         Across KS2 pupils should know:         •       how to use learning from science to help design and make products that work         •       how to use learning from mathematics to help design and make products that work         •       that materials have both functional properties and aesthetic qualities         •       that materials can be combined and mixed to create more useful characteristics         •       that materials can be combined and mixed to create more useful characteristics         •       that mechanical and electrical systems have an input, process and output         •       the correct technical vocabulary for the projects they are undertaking         In early KS2 pupils should also know:       •         •       how mechanical systems such as levers and linkages or pneumatic systems create movement         •       how mechanical systems such as levers and linkages or pneumatic systems create movement         •       how mechanical systems such as levers and linkages or pneumatic systems create movement         •       how mechanical systems such as levers and linkages or pneumatic systems create movement         •       how mechanical systems such as levers and linkages or pneumatic systems create movement         •       how mechanical systems such as levers and linkages or pneumatic systems create movement         •       how to program a computer to control their products
		<ul> <li>Food Preparation, Cooking and Nutrition Across KS1 pupils should know: <ul> <li>how to name and sort foods into the five groups in The Eatwell plate</li> <li>that everyone should eat at least five portions of fruit and vegetables every day</li> <li>how to prepare simple dishes safely and hygienically, without using a heat source</li> <li>how to use techniques such as cutting and peeling</li> </ul></li></ul>	<ul> <li>Food Preparation, Cooking and Nutrition</li> <li>Across KS2 pupils should know: <ul> <li>how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source</li> <li>how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking</li> <li>In early KS2 pupils should also know:</li> <li>that a healthy diet is made up from a variety and balance of different food and drink, as depicted in The Eatwell plate</li> <li>that to be active and healthy, food and drink are needed to provide energy for the body</li> <li>In late KS2 pupils should also know:</li> <li>that recipes can be adapted to change the appearance, taste, texture and aroma</li> <li>that different food and drink contain different substances – nutrients, water and fibre – that are needed for health</li> </ul> </li> </ul>



Lower KS2	Autumn Term	Spring Term	Summer Term
	Mechanisms	Cooking & Nutrition	Structures & Computer-aided Design
Prior Knowledge (Retrieval)	<ul> <li>Year 1/Year 2 Talk about simple mechanisms they have made before. Y2 <ul> <li>wheeled vehicle</li> </ul> </li> <li>Design <ul> <li>Identify the function and purpose of a mechanism and how it works. (How did their mechanism work? Boat, wheeled vehicle)</li> <li>Identify the importance of mock ups and why they important to the design process. (How did they know their design would work?)</li> </ul> </li> <li>Make <ul> <li>Identify that a plan is needed before a product is made. (What did they need to do with all their ideas before they begin to make a mechanism?)</li> <li>Explain choices as to why tools were selected (What tools were used and why? Saws, bench hooks and scissors.)</li> <li>Give reasons for measuring and marking was needed to make a wheeled vehicle. (When did you need to measure your materials and why?)</li> <li>Give examples of finishing techniques used for their products- (How did you make your wheeled vehicle look better?)</li> <li>Give examples of how you assembled materials. (How did you join materials?)</li> </ul> </li> <li>Evaluate <ul> <li>Identify why it is important to make improvements to their products.</li> </ul> </li> </ul>	<ul> <li>Year 1/ Year 2 Talk about fruit salad that they made in Y1 and vegetable wrap that they made in Y2 Design <ul> <li>Identify the purpose of their vegetable wrap and fruit salad (How did you make this healthy and who was in for?)</li> </ul> </li> <li>Make <ul> <li>Identify that a plan is needed before a product is made. (What do they need to prepare prior to making their product- ingredients, equipment and hygiene)</li> <li>Explain choices for ingredients selected (What ingredients were used and why?)</li> <li>Give examples of finishing techniques used for their products- (How did they make their wrap look better?) </li> <li>Technical knowledge <ul> <li>Describe that all food comes from plants and animals. (Which foods are farmed, grown elsewhere or caught?)</li> <li>Name and sort foods into the 5 groups of the Eatwell Plate (fruits and vegetables, carbohydrates, protein, dairy and other alternatives, oils and spreads.) Can they sort selected foods into the 5 groups?</li> </ul> </li> </ul></li></ul>	<ul> <li>Year 1 Talk about simple structures they made in Y1- Percy's House Design <ul> <li>Identify a purpose for their structure. (What was their structure and for what purpose?)</li> <li>Identify that mock ups are part of the design process and why (why is it important to make a mock up?)</li> </ul> </li> <li>Make <ul> <li>Identify a plan for the making process. (Why do you need to know what to do next?)</li> <li>Explain choices as to why tools were selected (paper, card, scissor) What equipment and tools did you use and why?</li> <li>Give examples of finishing techniques used for their products- (How did you make your house for Percy look better?)</li> <li>Give reasons why measuring and marking was needed to make Percy's House (When did you need to measure your materials and why?), levers</li> </ul> </li> <li>Evaluate <ul> <li>Explain their understanding of strong freestanding structures (How would they strengthen their structure?)</li> </ul> </li> <li>Technical Knowledge <ul> <li>Check pupils understanding on the term- nets, joins, levers, and sliders</li> </ul> </li> </ul>
Y3	D & T Element - Mechanisms	D & T Element – Cooking & Nutrition	D & T Element – Structures & Computer-aided design
Key person/event	Pneumatics Systems Knowledge and Skills to be developed: Designing	Perfect Pizza Knowledge and Skills to be developed: Designing	Mini Treehouses Knowledge and Skills to be developed:
History of tree houses and designers/Eden Project	Designing Create their own design criteria and use these to inform their ideas for their labelled design. Draw annotated sketches to communicate their design ideas. Model their ideas using prototypes.	<b>Designing</b> Create their own design criteria and use these to inform their ideas for their labelled design. Draw annotated sketches to communicate their design ideas.	<b>Designing</b> Create their own design criteria and use these to inform their ideas for their labelled design. Draw annotated sketches to communicate their design ideas. Model their ideas using prototypes.



	Make design decisions that take account of the availability of resources. Making Create a plan by ordering the main stages of making. Select from a wider range of tools and equipment explaining their choices. Select from and use a wider range of materials and components according to their functional properties and aesthetic qualities. Measure, mark, cut and shape a range of materials and components. Assemble, join and combine materials with some accuracy. <b>Evaluating</b> Investigate and analyse a range of existing products. Use their design criteria to evaluate their completed products. Name and describe some inventors and how their inventions have shaped the world. Identify why it is important to make improvements to their products. <b>Technical Knowledge</b> Describe how mechanical systems create movement. Use mechanical systems in their products.	Make design decisions that take account of the availability of resources. Making Create a plan by ordering the main stages of making Select from a range of tools and equipment explaining their choices- cheese grater, knives, spoon for cutting, slicing, grating, spreading. Select from and use a wider range of materials and components according to their functional properties and aesthetic qualities. Measure, mark, cut and shape a range of materials and components. Assemble, join and combine materials with some accuracy. <b>Evaluating</b> Investigate and analyse a range of existing products. Use their design criteria to evaluate their completed products. <b>Technical Knowledge</b> Use the correct technical vocabulary for the projects they are undertaking- peeling, cutting, slicing, grating, contamination, hygiene <b>Cooking and Nutrition</b> Describe that all food comes from plants and animals. Identify that food is grown, reared and caught in the UK, Europe and the wider world. Identify that a healthy diet is made up from a variety and balance of different food and drink, (Eatwell plate). Fruit and vegetables Carbohydrates Protein Dairy and other alternatives Oil and spreads Prepare and cook with a heat source. Use a range of techniques such as chopping, slicing, grating, and spreading.	Make design decisions that take account of the availability of resources. Making Create a plan by ordering the main stages of making. Select from a wider range of tools and equipment explaining their choices. Marking, scoring, cutting. Select from and use a wider range of materials and components according to their functional properties and aesthetic qualities. Measure, mark, cut and shape a range of materials and components. Assemble, join and combine materials with some accuracy. Apply a range of finishing techniques, including those from art and design and ICT (CAD), with some accuracy. Use their design criteria to evaluate their completed products. Name and describe some inventors and how their inventions have shaped the world. For example, Eden project or Nelson Treehouses website Technical Knowledge Use the correct technical vocabulary for the projects they are undertaking. Geometric shapes Build freestanding structures applying knowledge of how to make the structure stronger, stiffer and more stable.
Future learning	Moveable toys (Y5)	grating, mixing, and spreading. Savoury scones (Y4)	Minotaur maze (Y4)
	<ul> <li>Use annotated sketches, cross sectional drawings and explodes diagrams to show their designs.</li> <li>Make appropriate lists of resources that they will use, such as glue-guns, card, scissors, cams and dowelling rods.</li> </ul>	<ul> <li>To make a savoury scone- understanding the vocabulary hygiene and adapt.</li> <li>Use equipment such as knives, spoons, weighing scales and rolling pin.</li> </ul>	<ul> <li>Children will design, make and evaluate a minotaur maze.</li> <li>Learn about Daedalus- the inventor of the labyrinth (minotaur maze)</li> <li>Use tools such as glue guns, hammers, nails and saws to strengthen a structure.</li> </ul>



	<ul> <li>Reinforce and strengthen a 3D framework.</li> <li>Use technical vocabulary, such as weaker, stronger, structures, reinforce, movements, mechanism, rotation and comparing.</li> </ul>	<ul> <li>Measuring out ingredients and shaping their scones.</li> <li>Considering the views of others when evaluating.</li> </ul>	<ul> <li>Use technical vocabulary such as frame, structure and adapting.</li> </ul>
Designing Vocabulary	comparison, benefits, pneumatic system, key features, labelling, appeal, create, construct, syringes, suggesting, benefits, annotate, prototype	Slice of, labelling, target audience, appearance, benefits, recipe, nutrition, appeal, health benefits, hygienically, ingredients, food growth, taste, sweet, sour, hot, spicy, smell, preference, greasy, moist, cook, fresh, savoury, reared, caught, grown, techniques, utensils	Target audience, purpose, benefit, properties, frame structure, nets, frame, appeal, labelling, exploded diagrams, key features.
Making Vocabulary	Modification, model, key features, syringe, pneumatic system, constructing, motion, assemble, secure	Texture, peeling, cutting, slicing, grating, mixing, spreading, nutrition, ingredients, hygienically, recipe, contamination, names of equipment, utensils, techniques,	Construction, structure, secure, nets, frame, frame structure, reinforcing, strengthening, beam, strength, secure, stability, cutting, folding, tie, joining, strength, stages
Evaluating Vocabulary	Review, justify, opinion, constructive criticism	Evaluation, taste, sensory evaluation, texture, views, contructive criticism, justifying opinions, attraction	Comparing, effective, suggesting, review, views, benefits, modification, review, justify, opinion, constructive criticism, peer assessment
Technical Knowledge Vocabulary	Pneumatic system	Hygienically, recipe, contamination,	climate, seasonal, geometric shapes
Quality texts	<ul> <li>Pneumatic Monster Instructions text</li> <li>The Way Things Work Now: A Visual Guide to the World of Machines - David Macaulay</li> </ul>	<ul> <li>Iguana Boy Saves the World With a Triple Cheese Pizza - James Bishop</li> <li>Pizza!: An Interactive Recipe Book- Cook In A Book - Lotta Nieminen</li> </ul>	<ul> <li>The ?-Storey Treehouse - Andy Griffiths (various)</li> <li>BG Bird Builds a Treehouse - Nada Serafimovic</li> <li>Up in the Leaves - Shira Boss</li> </ul>
Enrichment activities (e.g. visits/ visitors)		Visit to ASK to make pizzas.	
National Curriculum	<ul> <li>Design:</li> <li>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</li> <li>generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</li> </ul>	<ul> <li>Design</li> <li>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</li> <li>generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes,</li> </ul>	<ul> <li>Design</li> <li>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</li> <li>generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</li> </ul>



### **Curriculum Plans**

#### Make

- select from and use a wider range of tools and equipment to perform practical tasks accurately
- select from and use a wider range of materials and components 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

- select from and use a wider range of tools and equipment to perform practical tasks accurately
- select from and use a wider range of materials and components, including ingredients, according to their functional properties and aesthetic qualities

#### Evaluate

Make

- 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

understand and use mechanical systems in their products apply their understanding of computing to program, monitor and control their products.

#### Food 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

### 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 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 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.