Gladstone Road Primary School Design Technology

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.

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GOLDEN THREADS	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Designing	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.	**Understanding Contexts, Users and Purposes** Across KS1 pupils should: • work confidently within a rangeof contexts, such as imaginary,story-based, home, school, gardens, playgrounds, local community, industry and the wider environment • state what products they aredesigning and making • say whether their products arefor themselves or other users • describe what their productsare for • say how their products willwork • say how they will make theirproducts suitable for their intended users • use simple design criteria tohelp develop their ideas		**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			
		Generating, Developing, Modelling and Communicating Ideas Across KS1 pupils should: • generate ideas by drawing on their own experiences • use knowledge of existing products to help come up with ideas • develop and communicate ideas by talking and drawing • model ideas by exploring materials, components and construction kits and by making templates and mock- ups • use information and communication technology, where appropriate, to develop and communicate their ideas		**Generating, Developing, Modelling and Communicating Ideas** Across KS2 pupils should: • share and clarify ideas through discussion • model their ideas using prototypes and pattern pieces • use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas • use computer-aided design to develop and communicate their ideas In early KS2 pupils should also: • generate realistic ideas, focusing on the needs of the user • make design decisions that take account of the availability of resources In late KS2 pupils should also: • generate innovative ideas, drawing on research • make design decisions, taking account of constraints such as time, resources and cost			
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 • select from a range of tools and equipment, explaining their choices • select from a range of materials and components according to their characteristics		**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			

	explaining the process they have used. PD: Fine motor Use a range of small tools, including scissors, paintbrushes and cutlery.	**Practical Skills and Techniques** Across KS1 pupils should: • follow procedures for safety and hygiene • use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components • measure, mark out, cut and shape materials and components • assemble, join and combine materials and components • use finishing techniques, including those from art and design	**Practical Skills and Techniques** Across KS2 pupils should: • follow procedures for safety and hygiene • use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components In early KS2 pupils should also: • measure, mark out, cut and shape materials and components with some accuracy • assemble, join and combine materials and components with some accuracy • apply a range of finishing techniques, including those from art and design, with some accuracy In late KS2 pupils should also: • accurately measure, mark out, cut and shape materials and components • accurately assemble, join and combine materials and components • accurately apply a range of finishing techniques, including those from art and design • use techniques that involve a number of steps • demonstrate resourcefulness when tackling practical problems
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, explaining the process they have used.	**Own Ideas and Products** Across KS1 pupils should: • talk about their design ideas and what they are making • make simple judgements about their products and ideas against design criteria • suggest how their products could be improved	**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
		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: • how well products have been designed • how well products have been made • why materials have been chosen • what methods of construction have been used • how well products work • how well products achieve their purposes • how well products meet user needs and wants In early KS2 pupils should also investigate and analyse: • who designed and made the products • where products were designed and made • when products were designed and made • whether products can be recycled or reused In late KS2 pupils should also investigate and analyse: • how much products cost to make • how innovative products are • how sustainable the materials in products are • what impact products have beyond their intended purpose

			Key Events and Individuals Across KS2 pupils should know: • about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products
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.	**Making Products Work** Across KS1 pupils should know: • about the simple working characteristics of materials and components • about the movement of simple mechanisms such as levers, sliders, wheels and axles • how freestanding structures can be made stronger, stiffer and more stable • that a 3-D textiles product can be assembled from two identical fabric shapes • that food ingredients should be combined according to their sensory characteristics • the correct technical vocabulary for the projects they are undertaking	**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 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 simple electrical circuits and components can be used to create functional products • how to program a computer to control their products • how to make strong, stiff shell structures • that a single fabric shape can be used to make a 3D textiles product • that food ingredients can be fresh, pre-cooked and processed In late KS2 pupils should also know: • how mechanical systems such as cams or pulleys or gears create movement • how more complex electrical circuits and components can be used to create functional products • how to program a computer to monitor changes in the environment and control their products • how to reinforce and strengthen a 3D framework • that a 3D textiles product can be made from a combination of fabric shapes • that a recipe can be adapted by adding or substituting one or more ingredients
		Food Preparation, Cooking and Nutrition Across KS1 pupils should know: • how to name and sort foods into the five groups in The Eatwell plate • that everyone should eat at least five portions of fruit and vegetables every day • how to prepare simple dishes safely and hygienically, without using a heat source • how to use techniques such as cutting and peeling	**Food Preparation, Cooking and Nutrition** Across KS2 pupils should know: • how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source • how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking • In early KS2 pupils should also know: • that a healthy diet is made up from a variety and balance of different food and drink, as depicted in The Eatwell plate • that to be active and healthy, food and drink are needed to provide energy for the body • In late KS2 pupils should also know: • that recipes can be adapted to change the appearance, taste, texture and aroma • that different food and drink contain different substances – nutrients, water and fibre – that are needed for health

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Lower KS2	**Autumn Term** Textiles and electricity	**Spring Term** Cooking and Nutrition	**Summer Term** Structures and Programming
Prior Knowledge (Retrieval)	**Year 2-Talk about making a hand puppet in Y2** • Identify the function and purpose of their hand puppet. (How did their hand puppet and who was it for?) • Identify the importance of mock ups and why they are important to the design process (How did they know their design would work?) • Identify steps needed to make their puppet. (What steps did you take to make your puppet?) • Explain choices as to why tools were selected (scissors, needles and threads) (What tools were used and why?) • Give reasons for cutting and shaping materials (When did you need to cut and shape materials and why?) • Give examples of how you assembled and joined (How did you join materials?) running stitch. • Give examples of techniques learnt (threading a needle and thread, tying a knot and running stitch.) • Identify why it is important to make adjustments and improvements to their products (Why was it important for them to make adjustments and improvements for their puppet?)	**Year 3- Talk about making a pizza and the vegetable wrap** • Identify the purpose of their pizza (How did they make it healthy and who was it for?) • Talk about how design decisions can be affected because of availability of resources. (Were they able to purchase all the ingredients that they planned for? How might someone be affected be limited availability of resources?) • Identify the main stages of the plan that are needed before a product is made (What do they need to prepare prior to making their product? Ingredients, equipment and hygiene) • Explain choices as to why tools were selected (cheese grater, knives, spoon for cutting, slicing, grating, spreading.) (What tools were used and why?) • Check pupils understanding on the terms- peeling, cutting, slicing, grating, contamination • Identify why it is important to make improvements to their products.	**Year 3- Talk about building a structure for the treehouse** • Identify a purpose for their structure (what was their structure and for what purpose?) • Identify that prototype are part of the design process and why? (Why is it important to make a prototype?) • Identify the main stages of the plan that are needed before a product is made (What do they need to prepare prior to making their product? Resources, equipment) • Explain choices as to why tools were selected (saws, rulers, glue guns, scissors.) (What tools were used for and why?) • Explain why they used a range of materials according to their functional properties and aesthetic qualities. (Why did you use wood to make your tree house?) • Explain how they joined and combined materials with accuracy. (Why did you ensure your tree house was made accuracy?) • Give examples of finishing techniques used for their products- (How did you make your wheeled vehicle look better?) • Explain how they used CAD to make their tree house. (How did you use CAD to make your tree house?) • Talk about inventions that have shapes the world, for example the Eden project and Nelson Treehouses website • Check pupils understanding on the terms- Geometric shapes Where did they need use geometric shapes in the designing of their treehouse and why? • Identify why it is important to make improvements to their products.
Y4 Key person/event	**D & T Element – Textiles and Electricity** Light up Christmas stockings Designing Generate realistic ideas focusing on the needs of the user.	**D & T Element – Cooking & Nutrition** Healthy Scones Designing Generate realistic ideas focusing on the needs of the user.	**D & T Element – Structures & Programming** Minotaur mazes and control a programmable toy around a maze Designing Generate realistic ideas focusing on the needs of the user.

Daedalus and the invention of the Labyrinth (Minotaur Maze)	Draw annotated sketches and cross-sectional drawings to communicate their design ideas. Model their ideas using prototypes and pattern pieces. Make design decisions that take account of the availability of resources. **Making** Create a plan by ordering the main stages of making. Select and explain their choice of tools and equipment in relation to the skills and techniques they will be using- needles, scissors, threads. Select and explain their choice of materials and components according to functional properties and aesthetic qualities. Measure, mark, cut and shape a range of materials and components- fabric and thread. Assemble, join and combine materials with some accuracy. Threading a needle and tying a knot, blanket stitch and overcast stitch. Apply a range of finishing techniques, including those from art and design, with some accuracy. **Evaluating** Investigate and analyse a range of existing products. Use their design criteria to evaluate their completed products. Consider the views of others, including intended users, to improve their work. **Technical Knowledge** Know how a simple electrical circuit and components can be used to create functional products and know electrical systems have an input and a process. Reinforce and strengthen a 3D framework.	Draw annotated sketches and cross-sectional drawings to communicate their design ideas. Make design decisions that take account of the availability of resources. **Making** Create a plan by ordering the main stages of making. Select and explain their choice of tools and equipment in relation to the skills and techniques they will be using weighing scales, knives, spoons, rolling pin. Select and explain their choice of materials and components according to functional properties and aesthetic qualities. Measure, mark, cut and shape a range of materials and components- measuring out ingredients, shaping scones.. Apply a range of finishing techniques, including those from art and design, with some accuracy. **Evaluating** Investigate and analyse a range of existing products. Use their design criteria to evaluate their completed products. Consider the views of others, including intended users, to improve their work. **Technical Knowledge** Know the correct technical vocabulary for the products they are undertaking- hygiene, adapting **Cooking and Nutrition** 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 savoury scones safely and hygienically. Link to PSHE (My healthy lifestyle). Evaluating – investigating existing products (different scones) - making it healthier	Draw annotated sketches and cross-sectional drawings 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 and explain their choice of tools and equipment in relation to the skills and techniques they will be using-saws, scissors, glue guns Select and explain their choice of materials and components according to functional properties and aesthetic qualities. Measure, mark, cut and shape a range of materials and components- wood, cardboard Assemble, join and combine materials with some accuracy. Apply a range of finishing techniques, including those from art and design, with some accuracy. **Evaluating** Investigate and analyse a range of existing products. Use their design criteria to evaluate their completed products. Consider the views of others, including intended users, to improve their work. Name and describe some inventors and how their inventions have shaped the world. for example, Y4- Daedelus – inventor of the labyrinth (minotaur maze) **Technical Knowledge** Reinforce and strengthen a 3D framework., glue guns, hammers and nails, saws. Know the correct technical vocabulary for the product they are undertaking, frame, structure and adapting, <u>STRUCTURE (minotaur maze)</u> Make base out of thick card base. Hammer and nail doweling to make an edge/ border Glue gun to the cardboard base Glue gun minotaur maze together
Future learning	**Make Do and Mend (Y6)** • Make designs of a WW2 item, taking account of constraints such as time, resources and cost – linking to that of this time period too.	**Savoury biscuits (Y5)** • Children will use a computer to design prototypes rather than on paper.	**Bridges (Y5)** • Children will use a computer to design prototypes rather than on paper, as well as researching

	• Develop knowledge of new stitches - zig zag stitch, hidden stitches and visible stitch (overstitch or blanket stitch), fastenings and learning to secure their last stitch. • Develop the skill of applique	• Assemble and join to create a gift box fit for purpose for the savoury biscuit. • Vocabulary – 'healthier option' and 'nutritional' – what do they mean? • Identify that food is grown, reared and caught in the UK, **Europe and the wider world.** • Learn how food is **processed** into ingredients that can be eaten or used in cooking.	bridges and their structures to find out about strength. • Accurately create the finishing touches of the bridge actually moving. • Learn about a famous bridge inventor. • Learn and be able to use the vocabulary: weaker, stronger structures, reinforce, compression, tension, shaft, abutments
Design Vocabulary	Annotate, sketch, communicate, prototype, availability, target audience, effective, ineffective, characteristics, findings, design criteria, labels, captions, diagrams, original design, investigate, desired effect, design criteria,, purpose	Target audience/user, comparing, products, town, county, North Yorkshire, taste testing. inspiration, desired effects, characteristics, Effective, ineffective, budget, market research, informs, findings, design criteria, personalising, label, captions, diagram, articulating, taste testing, products, original design, purpose, taste, texture, flavour.	Annotate, sketch, communicate, prototype, availability, target audience, effective, ineffective, characteristics, findings, design criteria, labels, captions, diagrams, original design, investigate
Make Vocabulary	Create, stages, techniques, components, functionality, qualities, finish	budget, increase, decrease, finish	Create, stages, techniques, components, functionality, qualities
Evaluate Vocabulary	Analyse, evaluate, design criteria, intended users, adapt, finish modification	environmental impact texture, adapting, evaluating, finish modification	Analyse, evaluate, design criteria, intended users, adapt, finish modification
Technical Knowledge Vocabulary	Functional product, reinforce, strengthen, process, framework, structure, adapt, effective, ineffective, blanket stitch, overstitch, reinforce	workmanship, effective, ineffective, nutrients. increase, decrease measuring, grams, g, degrees, heat, food groups (carbohydrates, protein, fats, dairy, oils and spreads) Kneading, baking, chopping, slicing, mixing	Functional product, reinforce, strengthen, process, framework, structure, adapt, effective, ineffective,
Quality texts	Twas the night before Xmas – the uses of a Christmas stocking.	The History of Scones – online text (freshways) A selection of recipes (online and from cooking books – bero/ Mary Berry/ BBC good food)	Greek mythology (a series of Greek Myths – Theseus and the Minotaur) Theseus and the Minotaur – picture book to support
Enrichment activities (e.g. visitors/ visits)		Fun filled food Journey – visitor into school workshop	Visitor into school – History links HISTORY SQUAD Ancient Greeks
National Curriculum	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	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,	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, textiles 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].	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 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 • understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] • 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 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.