

# Design and Technology at St Mary's

## Intent

At St Mary's, we aim to provide a DT curriculum that fully explores this practical subject. We encourage children to use their creativity and imagination, to design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. We encourage developing DT skills by working both as members of a team and as individuals. We aim to, wherever possible, link work to other disciplines such as mathematics, science, computing and art. The children are also given opportunities to reflect upon and evaluate past and present design technology, its uses and its effectiveness. Our students are encouraged to see that DT skills are useful life skills, e.g. cooking, construction, circuits.

"Design is not just what it looks like and feels like. Design is how it works." – Steve Jobs

## Implementation

The DT curriculum is clear and comprehensive scheme of work in line with the National Curriculum.

Each year groups undertakes a construction, textile and food topic.

Each project will follow the research, design, make and evaluate cycle.

Pupils will be taught a range of skills ensuring that pupils are aware of health and safety issues related to the tasks undertaken.

Clear and appropriate cross curricular links will underpin learning and life skills. Pupils will be enabled to apply skills in hands on situations with a purposeful context.

In DT pupils may be asked to solve problems and develop their learning independently. This allows the pupils to have ownership over their learning in DT.

Pupils will have opportunities to work in pairs and groups, learning to support and help one another towards a challenging yet rewarding goal.



### Impact

Pupils will ultimately know more, remember more and understand more about DT, demonstrating this knowledge when using tools or skills in other areas of the curriculum.

Pupils will have clear enjoyment and confidence in DT, that they will then apply to areas of the curriculum.

The large majority of pupils will achieve age related expectations in DT.

As designers' pupils will develop skills and attributes they can use beyond

### Threshold Concepts for DT:

- **Master practical skills**  
This concept involves developing the skills needed to make high quality products (we have highlighted a range of skills but they may be added to or changed as appropriate for your school).
- **Design, make, evaluate and improve**  
This concept involves developing the process of design thinking and seeing design as a process.
- **Take inspiration from design throughout history**  
This concept involves appreciating the design process that has influenced the products we use in everyday life.



## DT Vocabulary linked to 400-words project

|                          |                                                                                                                                                                          |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Milestone 1 Year 1 and 2 | Design, practical, measure, taste, weigh, ingredients, hygiene, folding, temperature, hinges, lever, construct, strengthen, mechanism, product, innovate, refine, danger |
| Milestone 2 Year 3 and 4 | Utensils, assemble, textiles, strengthen, mechanisms, pulleys, gears, leavers, efficient, pioneer, horticultural, disassemble                                            |
| Milestone 3 Year 5 and 6 | Ratios, scale, refine, tactile, components, rotary, liner, prototypes, innovative                                                                                        |

Subject specific vocabulary is taught using the follow strategy:

- Define it
- Capture the essence
- Apply it

Subject specific vocabulary will be visible on classroom displays and used by pupils in discussions and written work.





## DT Lenses

Every topic needs to cover all of the “design, make, evaluate and improve” objectives for your milestone and all of the “take inspiration from design throughout history” objectives for your milestone.

| DT        | Autumn                                                                                                                                                                                                                                                                       | Spring                                                                                                                                      | Summer                                                                                                                           |
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| Reception | Explore, use and refine a variety of artistic effects to express their ideas and feelings.<br>Return to and build on their previous learning, refining ideas and developing their ability to represent them.<br>Create collaboratively, sharing ideas, resources and skills. |                                                                                                                                             |                                                                                                                                  |
| Year 1    | <u>Mechanics and Materials</u><br>Making moving toys<br>Sliders and levers from DT association                                                                                                                                                                               | <u>Construction and Materials</u><br>Project linked to Felixstowe port<br>Free standing structures from DT association                      | <u>Food</u><br>Making a picnic<br>Preparing fruit and veg from DT association<br>All food milestone bullet points to be covered. |
| Year 2    | <u>Textiles</u><br>Making a rug/tapestry/table cloth for a castle. Each child to decorate a square and join them together.<br>Templates and joining techniques from DT association                                                                                           | <u>Food</u><br>Make a fruit salad<br>Preparing fruit and vegetables from DT association.<br>All food milestone bullet points to be covered. | <u>Mechanism, Construction and Materials</u><br>Fire Engines<br>Wheels and axles from DT association                             |
| Year 3    | <u>Food</u><br>Make a Palm oil free snack (link to Rainforest)<br>Healthy and varied diet from DT association                                                                                                                                                                | <u>Mechanics and Materials</u><br>Link to study of Ipswich<br>Levers and linkages from DT association<br>Study: Archimedes                  | <u>Textiles and Materials</u><br>Roman Slippers<br>2D shape to 3D product from DT association                                    |
| Year 4    | <u>Construction and Materials</u><br>Make a Mesopotamian inspired building<br>Shell structures from DT association                                                                                                                                                           | <u>Food</u><br>Make a stew link to Victorians<br>Healthy and varied diet from DT association                                                | <u>Electricals and Materials</u><br>Make a torch<br>Electrical and electronics from DT association                               |



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| Year 5 | <u>Structures and Materials</u><br>Anglo Saxon Huts<br>Frame structures from DT association                                                                         | <u>Food</u><br>Savoury and sweet scones<br>Celebrating culture and seasonality from DT association<br><br>Study: Jamie Oliver and link to healthy schools                     | <u>Mechanics and Materials</u><br>Ancient Greek link<br>Pulleys and gears from DT association<br><br>Study: Archimedes                                                             |
|        |                                                                                                                                                                     |                                                                                                                                                                               | Study: Michael Faraday                                                                                                                                                             |
| Year 6 | <u>Textiles and Materials</u><br>Make a Poppy, shopper bag.<br>Combining different fabric shapes from DT association.<br><br>Study: William Morris and Cath Kidston | <u>Food</u><br>Explorers, food suitable for a voyage<br>Storage, seasonality, micro-organisms – Louis Pasteur<br><br>Celebrating culture and seasonality from DT association. | <u>Electrical systems and Materials</u><br>Volcano eruption warning alarm.<br>More complex switches and circuits from DT association.<br><br>Study: David Dempsey and Shane Cronin |
|        |                                                                                                                                                                     |                                                                                                                                                                               |                                                                                                                                                                                    |





### Breadth of Study:

Note: Items marked \* are not statutory.

| Key Stage 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Key Stage 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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| <p>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, such as the home and school, leisure, culture, enterprise, industry and the wider environment.</p> <p>When designing and making, pupils should be taught to:</p> <p><b>Design</b></p> <ul style="list-style-type: none"> <li>• design purposeful, functional, appealing products for themselves and other users based on design criteria.</li> <li>• generate develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.</li> </ul> <p><b>Make</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, shaping, joining and finishing.</li> </ul> | <p>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, such as the home, school, leisure, culture, enterprise, industry and the wider environment.</p> <p>When designing and making, pupils should be taught to:</p> <p><b>Design</b></p> <ul style="list-style-type: none"> <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> <p><b>Make</b></p> <ul style="list-style-type: none"> <li>• select from and use a wider range of tools and equipment to perform practical tasks, such as cutting, shaping, joining and finishing, accurately.</li> <li>• 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.</li> </ul> |



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| <ul style="list-style-type: none"><li>• select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics.</li></ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"><li>• explore and evaluate a range of existing products.</li><li>• evaluate their ideas and products against design criteria.</li></ul> <p><b>Technical knowledge</b></p> <ul style="list-style-type: none"><li>• build structures, exploring how they can be made stronger, stiffer and more stable.</li><li>• explore and use mechanisms, such as levers, sliders, wheels and axles, in their products.</li></ul> <p><b>Cooking and nutrition</b></p> <ul style="list-style-type: none"><li>• use the basic principles of a healthy and varied diet to prepare dishes.</li><li>• understand where food comes from.</li></ul> | <p><b>Evaluate</b></p> <ul style="list-style-type: none"><li>• investigate and analyse a range of existing products.</li><li>• evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.</li><li>• understand how key events and individuals in design and technology have helped shape the world</li></ul> <p><b>Technical knowledge</b></p> <ul style="list-style-type: none"><li>• apply their understanding of how to strengthen, stiffen and reinforce more complex structures.</li><li>• understand and use mechanical systems in their products, such as gears, pulleys, cams, levers and linkages.</li><li>• understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs, buzzers and motors.</li><li>• apply their understanding of computing to programme, monitor and control their products.</li></ul> <p><b>Cooking and nutrition</b></p> <ul style="list-style-type: none"><li>• understand and apply the principles of a healthy and varied diet.</li><li>• prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques.</li><li>• understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed</li></ul> |
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## DT Milestones

Taught in both years

Taught in first year of milestone

Taught in second year of milestone

| Threshold Concepts                                                                                                                                                                            |           | Milestone 1 (KS1)<br>Year 1 and 2                                                                                                                                                                                           | Milestone 2 (LKS2)<br>Year 3 and 4                                                                                                                                                                                                                                                                                | Milestone 3 (UKS2)<br>Year 5 and 6                                                                                                                                                                                                                                                                                                                                                                                                             |
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| <b>Master practical skills</b><br>This concept involves developing the skills needed to make high quality products (we have highlighted a range of skills but they may be added to or changed | Food      | <ul style="list-style-type: none"> <li>• Cut, peel or grate ingredients safely and hygienically.</li> <li>• Measure or weigh using measuring cups or electronic scales.</li> <li>• Assemble or cook ingredients.</li> </ul> | <ul style="list-style-type: none"> <li>• Prepare ingredients hygienically using appropriate utensils.</li> <li>• Measure ingredients to the nearest gram accurately.</li> <li>• Follow a recipe.</li> <li>• Assemble or cook ingredients (controlling the temperature of the oven or hob, if cooking).</li> </ul> | <ul style="list-style-type: none"> <li>• Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms).</li> <li>• Measure accurately and calculate ratios of ingredients to scale up or down from a recipe.</li> <li>• Demonstrate a range of baking and cooking techniques.</li> <li>• Create and refine recipes, including ingredients, methods, cooking times and temperatures.</li> </ul> |
|                                                                                                                                                                                               | Materials | <ul style="list-style-type: none"> <li>• Cut materials safely using tools provided.</li> </ul>                                                                                                                              | <ul style="list-style-type: none"> <li>• Cut materials accurately and safely</li> </ul>                                                                                                                                                                                                                           | <ul style="list-style-type: none"> <li>• Cut materials with precision and refine the finish with</li> </ul>                                                                                                                                                                                                                                                                                                                                    |



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|          |  | <ul style="list-style-type: none"> <li>• Measure and mark out to the nearest centimetre.</li> <li>• Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling).</li> <li>• Demonstrate a range of joining techniques (such as gluing, hinges or combining materials to strengthen).</li> </ul> | <p>by selecting appropriate tools.</p> <ul style="list-style-type: none"> <li>• Measure and mark out to the nearest millimetre.</li> <li>• Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs).</li> <li>• Select appropriate joining techniques.</li> </ul> | <p>appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape).</p> <ul style="list-style-type: none"> <li>• Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper).</li> </ul>                                                              |
| Textiles |  | <ul style="list-style-type: none"> <li>• Shape textiles using templates.</li> <li>• Join textiles using running stitch.</li> <li>• Colour and decorate textiles using a number of techniques (such as dyeing, adding sequins or printing).</li> </ul>                                                                                     | <ul style="list-style-type: none"> <li>• Understand the need for a seam allowance.</li> <li>• Join textiles with appropriate stitching.</li> <li>• Select the most appropriate techniques to decorate textiles.</li> </ul>                                                                                                                   | <ul style="list-style-type: none"> <li>• Create objects (such as a cushion) that employ a seam allowance.</li> <li>• Join textiles with a combination of stitching techniques (such as back stitch for seams and running stitch to attach decoration).</li> <li>• Use the qualities of materials to create suitable visual and tactile effects in the decoration of textiles (such as a soft decoration for comfort on a cushion).</li> </ul> |



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| Electricals and electronics                                                                                                           |              |                                                                                                                                                                                                                          | <ul style="list-style-type: none"> <li>• Create series and parallel circuits</li> </ul>                                                                                                                                                                                                                                                                                               | <ul style="list-style-type: none"> <li>• Create circuits using electronics kits that employ a number of components (such as LEDs, resistors, transistors and chips).</li> <li>• Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding).</li> </ul>                                                                                    |
|                                                                                                                                       | Construction | <ul style="list-style-type: none"> <li>• Use materials to practise drilling, screwing, gluing and nailing materials to make and strengthen products.</li> </ul>                                                          | <ul style="list-style-type: none"> <li>• Choose suitable techniques to construct products or to repair items.</li> <li>• Strengthen materials using suitable techniques.</li> </ul>                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>• Convert rotary motion to linear using cams.</li> <li>• Use innovative combinations of electronics (or computing) and mechanics in product designs.</li> <li>• Design with the user in mind, motivated by the service a product will offer (rather than simply for profit).</li> <li>• Make products through stages of prototypes, making continual refinements.</li> </ul> |
|                                                                                                                                       | Mechanics    | <ul style="list-style-type: none"> <li>• Create products using levers, wheels and winding mechanisms.</li> </ul>                                                                                                         | <ul style="list-style-type: none"> <li>• Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers, winding mechanisms, pulleys and gears).</li> <li>• Design with purpose by identifying opportunities to design.</li> <li>• Make products by working efficiently (such as by carefully selecting materials).</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Design, make, evaluate and improve<br>This concept involves developing the process of design thinking and seeing design as a process. |              | <ul style="list-style-type: none"> <li>• Design products that have a clear purpose and an intended user.</li> <li>• Make products, refining the design as work progresses.</li> <li>• Use software to design.</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                     |





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|                                                                                                                                                                                   |  |                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>• Refine work and techniques as work progresses, continually evaluating the product design.</li> <li>• Use software to design and represent product designs.</li> </ul>                                                                                                                          | <ul style="list-style-type: none"> <li>• Ensure products have a high quality finish, using art skills where appropriate.</li> <li>• Use prototypes, cross-sectional diagrams and computer aided designs to represent designs.</li> </ul>                                                                                                          |
| <p><b>Take inspiration from design throughout history</b><br/>This concept involves appreciating the design process that has influenced the products we use in everyday life.</p> |  | <ul style="list-style-type: none"> <li>• Explore objects and designs to identify likes and dislikes of the designs.</li> <li>• Suggest improvements to existing designs.</li> <li>• Explore how products have been created.</li> </ul> | <ul style="list-style-type: none"> <li>• Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs.</li> <li>• Improve upon existing designs, giving reasons for choices.</li> <li>• Disassemble products to understand how they work</li> </ul> | <ul style="list-style-type: none"> <li>• Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices.</li> <li>• Create innovative designs that improve upon existing products.</li> <li>• Evaluate the design of products so as to suggest improvements to the user experience.</li> </ul> |





## Cultural capital in DT:

|                     | Autumn | Spring | Summer |
|---------------------|--------|--------|--------|
| Whole school events |        |        |        |
| Reception           |        |        |        |
| Year 1              |        |        |        |
| Year 2              |        |        |        |
| Year 3              |        |        |        |
| Year 4              |        |        |        |
| Year 5              |        |        |        |
| Year 6              |        |        |        |

## Cross curricular in DT:

|        | Autumn                  | Spring                     | Summer                         |
|--------|-------------------------|----------------------------|--------------------------------|
| Year 1 | History - Toys          |                            |                                |
| Year 2 | History - Castles       | History - Felixstowe       |                                |
| Year 3 | Geography - Rainforests | History – Study of Ipswich | History – Great fire of London |
| Year 4 | History – Mesopotamia   | History – Victorians       | History - Romans               |
| Year 5 | History – Anglo Saxons  |                            | Science - electricity          |
| Year 6 | History WW2             | History - explorers        | History – Ancient Greeks       |
|        |                         |                            | Geography – Volcanos / Italy   |