Design & Technology Curriculum - Penshurst CE Primary School

Have nothing in your house that you do not know to be useful, or believe to be beautiful.
William Morris

Buy less. Choose well. Make it last. Quality, not quantity.
Vivienne Westwood

Design and Technology Curriculum
2 Year Rolling Programme (Year A 24/25 & 26/27 – Year B 25/26 and 27/28

Intent

Design & Technology gives children the opportunity to develop skills, knowledge and understanding of designing and making functional products. We feel it is vital to nurture creativity and innovation through design, and by exploring the designed and made world in which we all live and work – design technology is an exciting vehicle that they can use to explore this. Pupils will learn about design and technology past and present; they will understand the role of the end user in product development and evaluation. Through the design process they will learn about aesthetics, social and environmental issues and concerns – for example sustainability – as well as developing their practical skills. Design Technology provides opportunities to develop problem solving skills.

Implementation

Design and Technology is taught through a rolling programme that ensures that learners use prior knowledge and skills and build on these, year on year. All aspects of the Design and Technology National Curriculum are taught so that pupils acquire a real sense of the range of foci that learning in D&T can bring. Design and Technology projects will follow the cycle shown on our long term plan. Units are carefully placed so that pupils can use knowledge acquired in another D&T discipline or previous year group to inform their learning.

Through precision teaching pupils will also learn the processes and steps a product designer or developer undertakes. The D&T curriculum is taught in all year groups and builds on the foundational knowledge our pupils acquire in the Foundation Stage.

D&T is taught across the academic year and units are planned to take place in each half term so that pupils are able to have a rich and varied D&T knowledge/skills base. Pupils also learn about the work of key designers so that they can see real outcomes in the wider world.

Impact

- Pupils will have a good understanding of what Design and Technology is.
- Pupils will be able to articulate how this learning will support them in their future learning in school and beyond.
- Pupils will build term on term, year on year their knowledge and skills related to Design and Technology
- Pupils will be able to use appropriate technical vocabulary and use this in their work.
- Pupils will be able to discuss why Design and Technology is an important subject in relation to their own lives now and in the future.

Design and make ‘something’ for ‘somebody’ for ‘some purpose’

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Year A	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Foundation Stage						
Elm Class Year 1 & 2	**Core discipline:** Mechanisms **Key Concept:** Sliders and levers	**Core discipline:** Structures **Key Concept:** Freestanding structures	**Core discipline:** Food and nutrition **Key Concept:** Preparing fruit and vegetables	**Core discipline:** Understanding materials **Key Concept:** Selecting materials **CUSP link: Materials**	**Core discipline:** Textiles **Key Concept:** Templates and joining techniques **CUSP link: Hot and cold places**	**Core discipline:** Food and nutrition **Key Concept:** Understanding a recipe
Beech Class Year 3 & 4	**Core discipline:** Textiles **Key Concept:** Combining materials	**Core discipline:** Food and nutrition **Key Concept:** A balanced and varied diet **CUSP link: Animals, including humans**	**Core discipline:** Mechanisms **Key Concept:** Levers and linkages **CUSP link: Forces and magnets**	**Core discipline:** Electrical systems **Key Concept:** Switches and circuits **CUSP link: Light**	**Core discipline:** Food and nutrition **Key Concept:** Adapting a recipe	**Core discipline:** Structures **Key Concept:** Developing strength in structures
Oak Class	**Core discipline:** Food and nutrition **Key Concept:** Eating seasonally	**Core discipline:** Electrical systems **Key Concept:** Complex switches and circuits	**Core discipline:** Textiles **Key Concept:** Making clothes last longer	**Core discipline:** Mechanisms **Key Concept:** Pulleys **CUSP link: Forces**	**Core discipline:** Structures **Key Concept:** Developing stability in structures	**Core discipline:** Food and nutrition **Key Concept:** Celebrating culture **CUSP link: World countries**
Year B	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Foundation Stage						
Elm Class	**Core discipline:** Textiles **Key Concept:** Exploring shape and texture	**Core discipline:** Food and nutrition **Key Concept:** Following a recipe **CUSP link: Animals, including humans (Keeping healthy)**	**Core discipline:** Mechanisms **Key Concept:** Axles and wheels	**Core discipline:** Understanding materials **Key Concept:** Manipulating materials **CUSP link: Use of everyday materials**	**Core discipline:** Food and nutrition **Key Concept:** Increasing our intake of fruit and vegetables	**Core discipline:** Structures **Key Concept:** Freestanding structures with moving parts
Beech Class	**Core discipline:** Food and nutrition **Key Concept:** Food choices	**Core discipline:** Mechanisms **Key Concept:** Hinges	**Core discipline:** Electrical systems **Key Concept:** Switches and circuits revisited **CUSP link: Electricity**	**Core discipline:** Structures **Key Concept:** Designing structures	**Core discipline:** Textiles **Key Concept:** Fixings and fastenings	**Core discipline:** Food and nutrition **Key Concept:** Understanding dietary requirements **CUSP link: Animals, including humans (Digestion)**
Oak Class	**Core discipline:** Food and nutrition **Key Concept:** Eating ethically	**Core discipline:** Mechanisms **Key Concept:** Gears	**Core discipline:** Food and nutrition **Key Concept:** Eating on a budget	**Core discipline:** Structures **Key Concept:** Designing structures revisited	**Core discipline:** Electrical systems **Key Concept:** Complex switches and circuits **CUSP link: Electricity**	**Core discipline:** Textiles **Key Concept:** Sustainable materials

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Design Technology Skills Progression Year 1 to Year 6				
Threshold Concept	Breadth of Study	Milestone 1 (End Y2)	Milestone 2 (End Y4)	Milestone 3 (End Y6)
Master Practical Skills This concept involves developing the skills needed to make high quality products	Food	• Cut, peel or grate ingredients safely and hygienically. • Measure or weigh using measuring cups or electronic scales. • Assemble or cook ingredients.	• Prepare ingredients hygienically using appropriate utensils. • Measure ingredients to the nearest gram accurately. • Follow a recipe. • Assemble or cook ingredients (controlling the temperature of the oven or hob, if cooking).	• Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms). • Measure accurately and calculate ratios of ingredients to scale up or down from a recipe. • Demonstrate a range of baking and cooking techniques. • Create and refine recipes, including ingredients, methods, cooking times and temperatures.
	Materials	• Cut materials safely using tools provided. • Measure and mark out to the nearest centimetre. • Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling). • Demonstrate a range of joining techniques (such as gluing, hinges or combining materials to strengthen).	• Cut materials accurately and safely by selecting appropriate tools. • Measure and mark out to the nearest millimetre. • Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs). • Select appropriate joining techniques.	• Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape). • 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).
	Textiles	Shape textiles using templates. • Join textiles using running stitch. • Colour and decorate textiles using a number of techniques (such as dyeing, adding sequins or printing).	• Understand the need for a seam allowance. • Join textiles with appropriate stitching. • Select the most appropriate techniques to decorate textiles.	• Create objects (such as a cushion) that employ a seam allowance. • Join textiles with a combination of stitching techniques (such as back stitch for seams and running stitch to attach decoration).

				• 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).
	Electrics Electronics	• Diagnose faults in battery-operated devices (such as low battery, water damage or battery terminal damage).	• Create series and parallel circuits	• Create circuits using electronics kits that employ a number of components (such as LEDs, resistors, transistors and chips).
	Computing	Model designs using software.	• Control and monitor models using software designed for this purpose.	• Write code to control and monitor models or
	Construction	• Use materials to practise drilling, screwing, gluing and nailing materials to make and strengthen products.	• Choose suitable techniques to construct products or to repair items. • Strengthen materials using suitable techniques.	• Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding).
	Mechanics	• Create products using levers, wheels and winding mechanisms.	• Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers, winding mechanisms, pulleys and gears).	• Convert rotary motion to linear using cams. • Use innovative combinations of electronics (or computing) and mechanics in product designs.
Design, make, evaluate and improve This concept involves developing the process of design thinking and seeing design as a process.		• Design products that have a clear purpose and an intended user. • Make products, refining the design as work progresses. • Use software to design.	• Design with purpose by identifying opportunities to design. • Make products by working efficiently (such as by carefully selecting materials). • Refine work and techniques as work progresses, continually evaluating the product design. • Use software to design and represent product designs.	• Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). • Make products through stages of prototypes, making continual refinements. • Ensure products have a high quality finish, using art skills where appropriate. • Use prototypes, cross-sectional diagrams and computer aided designs to represent designs.

Take inspiration from design throughout history This concept involves appreciating the design process that has influenced the products we use in everyday life.	• Explore objects and designs to identify likes and dislikes of the designs. • Suggest improvements to existing designs. • Explore how products have been created.	• Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs. • Improve upon existing designs, giving reasons for choices. • Disassemble products to understand how they work.	• Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices. • Create innovative designs that improve upon existing products. • Evaluate the design of products so as to suggest improvements to the user experience.

Assessment of pupils:

The assessment of pupils is formative and is based on pupil outcomes and questioning from each lesson. The following can be used to assess pupils' knowledge and application of skills and techniques as well as their understanding and use of relevant vocabulary.

• Expectations for each block are made explicit on slide one, e.g. *At the end of this block pupils will know how to waterproof cotton fabric and which fabrics are both functional and hardwearing.*

• The *Point of reflection* section specifies the expected outcomes for each lesson.

• The *Questions for assessment* section in each block provides specific questions to be used with pupils to elicit their level of understanding of tools, techniques and effects, e.g. *How have the properties of the cotton changed? Is the cotton now more or less functional?*

• The *Oracy and Vocabulary* tasks provide ample opportunities for teachers to evaluate pupils' ability to:

- use the language of design and technology effectively;

- explain techniques, skills and processes;

- evaluate their own and others' work.

The vocabulary quiz provides an opportunity for teachers to assess pupils' deeper understanding and application of the technical vocabulary covered in the block.

-The exemplifications demonstrate the expected standard against which teachers can assess pupils' work.

The best form of assessment in design and technology is at the point of delivery, while pupils are working. This helps us to understand pupils' development as designers, rather than their ability to produce a prescribed end outcome. By encouraging pupils to articulate their thinking and reflections, we can understand which aspects of design and technology may require additional teaching and reshape teaching to support this.

Reasonable adjustments for pupils with SEND:

As part of the planning and preparation for the delivery of each block, teachers will need to consider how specific activities, or the delivery, may need to be adjusted to ensure that pupils with SEND are able to access the materials and participate fully in the lesson.

Pupils with language and communication difficulties (including those with ASD) may need additional visual prompts to help them understand what is expected of them. The task could be broken down into smaller, more manageable chunks and individual task boards used to demonstrate these.

Some pupils may have sensory sensitivities. For those pupils, adjustments may need to be made in order for them to access materials. Pupils who have difficulties with tasks requiring fine motor skills may need appropriate adjustments to be made to enable them to access the task and / or in order to keep them safe.

Health and safety:

The blocks highlight key tools, techniques and tasks for which potential risks need to be carefully managed. However, schools should follow their own risk assessment guidelines and policies when delivering CUSP Design and Technology. Regarding food and nutrition, it is advisable for the Design and Technology subject leader to have a basic certificate in food hygiene. This can be obtained through the City and Guilds Food Safety in Catering qualification which can be completed online. A simple record (see below) of which members of staff have relevant qualifications could be kept.