

# DT



## SUBJECT GUIDE

Phoenix Academy | Odell Road, Walsall, West Midlands WS3 2ED

*'We see you, we hear you, we are with you'*



## **CURRICULUM INTENT**

The topic curriculum at Phoenix Academy is designed to be both vibrant and creative and places children at its heart, it encompasses history, geography, art and DT, as well as science that works alongside our discreet science lessons and, when appropriate, based on the individual units covered. We believe that our curriculum provides an educational experience that excites children's imaginations, inspires them to learn, extends their horizons, deepens their understanding, and meets both their intellectual and personal needs.

Our curriculum is delivered through Imaginative Learning Projects (ILPs) which provide a rich provision of exciting and motivating learning activities that make creative links between all aspects of our children's learning and that allows them to revisit, consolidate and use the skills that they learn.

To help address and support the needs of our pupils, we believe that our children learn better when they are encouraged to use their imagination and apply their learning in engaging contexts. Our curriculum provides not only learning challenges but also opportunities to develop social skills, build confidence and a sense of value by requiring the children to solve problems, apply themselves creatively and express their knowledge and understanding effectively across the topics that they cover.

The planning of these units provides a rigorous framework of 'essential skills' that outlines what is to be covered by each topic. These 'essential skills' have been identified from the wider expectations of the national curriculum and streamlined to identify those that will provide a strong foundation of understanding for our pupils. They are revisited and built upon a four-year cycle and allow for progression by providing activities that are both age-related and aimed at their level of attainment.

These are used to encourage positive attitudes to learning which reflect the values and skills needed to promote responsibility for learning and future success. We understand that many of our children have barriers to their learning and we work hard to identify these barriers and break them down.

Our broad and balanced curriculum is designed to enable all children to become confident, enquiring and knowledge-thirsty learners, who will be prepared for each new stage of their education. Our curriculum provides children with a range of experiences to ignite curiosity, broaden cultural understanding and recognise their place individually, within the local area and the wider world.

Each topic starts with an introduction day or 'Wow' starter that is used to engage learners and build an interest right from the onset. Our implementation is adapted to the specific learning needs of our learners to provide support and challenge, ensuring an inclusive curriculum that meets the needs of all.

Teaching is delivered through a balance of direct teaching and carefully planned, child initiated activities. Timely interventions from all adults are given to move individuals forward, while teaching staff track the children's progress against the objectives of each topic, allowing gaps in their knowledge to be addressed as they progress through the school.



## **DT – INTENT**

At Phoenix Academy we aspire to provide a Design Technology curriculum which is inspiring and practical. We want our children to use 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 intend for all our pupils to acquire appropriate subject knowledge, skills and understanding as set out in the National Curriculum. We want Design and Technology to promote the spiritual, moral, cultural, mental and physical development of pupils as designers, so they can develop skills and attributes that can be used beyond school and into adulthood in order for them to be successful in later life.



## PROGRESS AND EVALUATION

Progress against these objectives is recorded at the end of each topic on the FFT Aspire tracking system and allows staff to identify gaps in learning and to plan accordingly in the future.

At the end of each topic an evaluation sheet is also completed with the children to identify what they enjoyed and learned from each topic and any areas in which they would like to learn more.

Example evaluation sheet:

The evaluation sheet is titled 'Traders and Raiders' and features a background illustration of a Viking longship. It includes the following sections:

- HOW I WOULD RATE MY UNDERSTANDING AND ENJOYMENT OF THE TOPIC...**: A row of five smiley faces ranging from a full smile to a frown.
- MY FAVOURITE LESSON OR ACTIVITY WAS...**: A large rectangular box with horizontal lines for writing.
- NEW WORDS I HAVE LEARNT DURING THIS TOPIC ARE...**: A large oval-shaped box with horizontal lines for writing.
- THE SKILLS I HAVE DEVELOPED ARE...**: A large rectangular box with horizontal lines for writing.
- TOPIC EVALUATION**: A central title box.
- 3 FACTS THAT I HAVE LEARNT FROM THIS TOPIC ARE...**: Three circular boxes, each with horizontal lines for writing.
- TEACHER COMMENT**: A large rectangular box with horizontal lines for writing.



## **PROGRAM OF STUDY - DT**

Design and technology is taught over a four-year rolling cycle of engaging and varied topics, covering all objectives within the National Curriculum, and tailored to meet the needs of our pupils who are taught within mixed age classes. Objectives are covered at multiple points over each year and cycle, ensuring that they are revisited and built upon to develop not only the knowledge and skills of current pupils but also to support those pupils that join from other settings. Design technology is approached as an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth, and well-being of the nation.

### **Design and technology programmes of study: key stages 1 and 2 National curriculum in England**

The national curriculum for design and technology aims to ensure that all pupils:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills to design and make high-quality prototypes and products for a wide range of users • critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook.

### **Attainment targets**

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.



## **Subject content - Key stage 1**

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 [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment].

When designing and making, pupils should be taught to:

### Design

- design purposeful, functional, appealing products for themselves and other users based on design criteria
- generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology
- Make
- select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]
- select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics
- Evaluate
- explore and evaluate a range of existing products
- evaluate their ideas and products against design criteria and technical knowledge
- build structures, exploring how they can be made stronger, stiffer and more stable
- explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.



## **Subject content - Key stage 2**

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 [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].

When designing and making, pupils should be taught to:

### 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, including construction materials, textiles 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

- 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.

## **Cooking and nutrition**

As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.

Pupils should be taught to:

### Key stage 1

- use the basic principles of a healthy and varied diet to prepare dishes
- understand where food comes from

### Key stage 2

- 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





## **PROGRESSION OF SKILLS AND KNOWLEDGE - DT**

Skills	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Generating ideas - designing</b>	<p>Design appealing products for a particular user based on simple design criteria.</p> <p>Generate initial ideas and design criteria through own experiences. Develop and communicate these ideas through talk and drawings and mockups where relevant.</p>	<p>Generate ideas based on simple design criteria and their own experiences, explaining what they could make. Develop, model and communicate their ideas through talking, mock-ups and drawings.</p>	<p>Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s.</p> <p>Use annotated sketches, prototypes, final product sketches and pattern pieces; communication technology, such as web-based recipes, to develop and communicate ideas.</p>	<p>Generate and clarify ideas through discussion with peers to develop design criteria to inform the design of products that are fit for purpose, aimed at particular individuals or groups.</p> <p>Use annotated sketches and appropriate information and communication technology, such as web-based recipes, to develop and communicate ideas.</p> <p>Generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches, cross-sectional and exploded diagrams.</p>	<p>Generate innovative ideas through research including surveys, interviews and questionnaires and discussion with peers to develop a design brief and criteria for a design specification.</p> <ul style="list-style-type: none"> <li>Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification. Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views. and, where appropriate, computer-aided design</li> </ul>	<p>Use research using surveys, interviews, questionnaires and web-based resources. to develop a design specification for a range of functional products. Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost.</p> <p>Generate and develop innovative ideas and share and clarify these through discussion. Communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams.</p>



Skills	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Making</b>	<ul style="list-style-type: none"> <li>Select and use simple utensils, tools and equipment to perform a job e.g. peel, cut, slice, squeeze, grate and chop safely; marking out, cutting, joining and finishing; cut, shape and join paper and card.</li> <li>Select from a range of ingredients and materials according to their characteristics to create a chosen product.</li> </ul>	<p>Plan by suggesting what to do next. Select and use tools, equipment, skills and techniques to perform practical tasks, explaining their choices.</p> <ul style="list-style-type: none"> <li>Select new and materials, reclaimed materials, and construction kits to build and create their products. Use simple finishing techniques suitable for the products they are creating.</li> </ul>	<p>Plan the main stages of making. Select from and use a range of appropriate utensils, tools and equipment with some accuracy related to their product.</p> <ul style="list-style-type: none"> <li>Select from and use finishing techniques suitable for the product they are creating.</li> </ul>	<ul style="list-style-type: none"> <li>Order the main stages of making. Select and use appropriate tools to measure, mark out, cut, score, shape and combine with some accuracy related to their products.</li> <li>Explain their choice of materials according to functional properties and aesthetic qualities.</li> <li>Select from and use materials and components, including ingredients, construction and electrical components according to their function and properties.</li> </ul>	<ul style="list-style-type: none"> <li>Produce detailed lists of equipment and fabrics relevant to their tasks.</li> <li>Write a step-by-step plan, including a list of resources required.</li> <li>Select from and use, a range of appropriate utensils, tools and equipment accurately to measure and combine appropriate ingredients, materials and resources.</li> </ul>	<ul style="list-style-type: none"> <li>Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components.</li> <li>Competently select from and use appropriate tools to accurately measure, mark, cut and assemble materials, and securely connect electrical components to produce reliable, functional products.</li> <li>Use finishing and decorative techniques suitable for the product they are designing and making.</li> </ul>



Skills	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Evaluating	<ul style="list-style-type: none"> <li>Taste, explore and evaluate a range of products to determine the intended user's preferences for the product</li> <li>Evaluate their ideas throughout and finished products against design criteria, including intended user and purpose.</li> </ul>	<ul style="list-style-type: none"> <li>Explore a range of existing products related to their design criteria.</li> <li>Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria.</li> </ul>	<ul style="list-style-type: none"> <li>Investigate a range of 3-D textile products, ingredients and lever and linkage products relevant to their project.</li> <li>Test their product against the original design criteria and with the intended user.</li> <li>Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.</li> </ul>	<ul style="list-style-type: none"> <li>Investigate and evaluate a range of products including the ingredients, materials, components and techniques that are used.</li> <li>Test and evaluate their own products against design criteria and the intended user and purpose.</li> <li>Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work.</li> </ul>	<ul style="list-style-type: none"> <li>Investigate and analyse products linked to their final product.</li> <li>Compare the final product to the original design specification and record the evaluations.</li> <li>Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. Consider the views of others to improve their work.</li> </ul>	<ul style="list-style-type: none"> <li>Continually evaluate and modify the working features of the product to match the initial design specification.</li> <li>Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests.</li> <li>Test the system to demonstrate its effectiveness for the intended user and purpose.</li> </ul>



Skills	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Vocabulary	planning, investigating design, evaluate, make, user, purpose, ideas, product,	investigating, planning, design, make, evaluate, user, purpose, ideas, design criteria, product, function	user, purpose, design, model, evaluate, prototype, annotated sketch, functional, innovative, investigate, label, drawing, function, planning, design criteria, annotated sketch, appealing	evaluating, design brief design criteria, innovative, prototype, user, purpose, function, prototype, design criteria, innovative, appealing, design brief, planning, annotated sketch, sensory evaluations	design decisions, functionality, authentic, user, purpose, design specification, design brief, innovative, research, evaluate, design criteria, annotate, evaluate, mock-up, prototype	function, innovative, design specification, design brief, user, purpose design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional, mock-up, prototype



Skills	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Food	<p>Understand where a range of fruit and vegetables come from e.g., farmed or grown at home.</p> <ul style="list-style-type: none"> <li>Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of <i>The Eatwell plate</i>.</li> <li>Know and use technical and sensory vocabulary relevant to the project.</li> </ul>		<ul style="list-style-type: none"> <li>Know how to use appropriate equipment and utensils to prepare and combine food.</li> <li>Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared, or caught.</li> <li>Know and use relevant technical and sensory vocabulary appropriately.</li> </ul>		<ul style="list-style-type: none"> <li>Know how to use utensils and equipment including heat sources to prepare and cook food.</li> <li>Understand about seasonality in relation to food products and the source of different food products.</li> <li>Know and use relevant technical and sensory vocabulary.</li> </ul>	
Vocabulary	<p>fruit and vegetable names, names of equipment and utensils sensory vocabulary e.g., soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet, choosing, ingredients,</p>		<p>name of products, names of equipment, utensils, techniques and ingredients texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury, hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet</p>		<p>ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble</p>	



Skills	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Structures	<ul style="list-style-type: none"> <li>• Know how to make freestanding structures stronger, stiffer and more stable.</li> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>		<ul style="list-style-type: none"> <li>• Develop and use knowledge of how to construct strong, stiff shell structures.</li> <li>• Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes.</li> </ul> <p>Know and use technical vocabulary relevant to the project.</p>		<ul style="list-style-type: none"> <li>• Understand how to strengthen, stiffen and reinforce 3-D frameworks.</li> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>	
Vocabulary	cut, fold, join, fix, structure, wall, tower, framework, weak, strong, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved, metal, wood, plastic circle, triangle, square, rectangle, cuboid, cube, cylinder		shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity, marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating, font, lettering, text, graphics, decision.		frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary and permanent	



Skills	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Textiles	<ul style="list-style-type: none"><li>Understand how simple 3-D textile products are made, using a template to create two identical shapes.</li><li>Understand how to join fabrics using different techniques e.g., running stitch, glue, over stitch, stapling.</li><li>Explore different finishing techniques</li><li>Know and use technical vocabulary relevant to the project.</li></ul>		<ul style="list-style-type: none"><li>Know how to strengthen, stiffen and reinforce existing fabrics.</li><li>Understand how to securely join two pieces of fabric together.</li><li>Understand the need for patterns and seam allowances.</li><li>Know and use technical vocabulary relevant to the project.</li></ul>			<ul style="list-style-type: none"><li>Produce a 3-D textile product from a combination of accurately made pattern pieces, fabric shapes and different fabrics.</li><li>Understand how fabrics can be strengthened, stiffened and reinforced where appropriate.</li><li>Know and use technical vocabulary relevant to the project.</li></ul>



**Vocabulary**

joining and finishing techniques, tools, fabrics and components, template, pattern pieces, mark out, join, decorate, finish

fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance

seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces, name of textiles and fastenings used, pins, needles, thread, pinking shears, fastenings,

Skills	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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<p><b>Mechanisms/ mechanical systems</b></p>	<ul style="list-style-type: none"> <li>• Explore and use sliders and levers.</li> <li>• Understand that different mechanisms produce different types of movement.</li> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>	<ul style="list-style-type: none"> <li>• Explore and use wheels, axles and axle holders.</li> <li>• Distinguish between fixed and freely moving axles.</li> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>	<ul style="list-style-type: none"> <li>• Understand and use lever and linkage mechanisms.</li> <li>• Distinguish between fixed and loose pivots.</li> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>	<ul style="list-style-type: none"> <li>• Understand that mechanical and electrical systems have an input, process and an output.</li> <li>• Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement. Know and use technical vocabulary relevant to the project.</li> </ul>
<p><b>Vocabulary</b></p>	<p>slider, lever, pivot, slot, bridge/guide, card, masking tape, paper fastener, join, pull, push, up, down, straight, curve, forwards, backwards</p>	<p>vehicle, wheel, axle and axle holder, chassis, body, cab assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism names of tools, equipment and materials used</p>	<p>mechanism, lever, linkage, pivot, slot, bridge, guide system, input, process, output linear, rotary, oscillating, reciprocating</p>	<p>pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor, circuit, switch, circuit diagram, annotated drawings, exploded diagrams, mechanical system, electrical system, input, process, output</p>



Skills	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Electrical systems	N/A		<ul style="list-style-type: none"> <li>Understand and use electrical systems in their products linked to science coverage.</li> <li>Apply their understanding of computing to program and control their products.</li> <li>Know and use technical vocabulary relevant to the project.</li> </ul>		<ul style="list-style-type: none"> <li>Understand and use electrical systems in their products linked to science coverage.</li> <li>Apply their understanding of computing to program, monitor and control their products.</li> <li>Know and use technical vocabulary relevant to the project.</li> </ul>	
Vocabulary	N/A		series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip, control, program, system, input device, output device		reed switch, toggle switch, push-to-make switch, push-to-break switch, light dependent resistor (LDR), tilt switch, light emitting diode (LED), bulb, bulb holder, battery, battery holder, USB cable, wire, insulator, conductor, crocodile clip control, program, system, input device, output device, series circuit, parallel circuit	



## Cultural Capital

**Cultural capital** is defined as the accumulation of knowledge, behaviours, and skills that a student can draw upon and which demonstrates their **cultural awareness, knowledge and competence**; it is one of the key ingredients a student will draw upon to be successful in society, their career and the world of work. At Phoenix Academy we work tirelessly to build our student aspirations and expose them to a range of experiences to help them achieve goals and become successful.

We recognise that for students to aspire and be successful academically and in the wider areas of their lives, they need to be given rich and sustained opportunities to develop their cultural capital. We do this in many ways, for example, through our curriculum, extra-curricular activities and trips.

We recognise that there are six key areas of development that are interrelated and contribute to building a student's cultural capital:

1. Personal Development
2. Social Development, including political and current affairs awareness
3. Physical Development
4. Spiritual Development
5. Moral Development
6. Cultural development

Where possible, each of these areas is covered over the course of individual topics



## TEACHING STAFF

All lessons are delivered and supported by class specific staff:

	ELM CLASS	ASH CLASS	PINE CLASS	CEDAR CLASS	ELDER CLASS	RAINBOW CLASS
TEACHER	A. Holmes	D. Crowther	C. O'Connor	S. Elcock	L. Tasker	G. Satchwell
CLASS SUPPORT	C. Stanyer	G. Sammonds & O. Maxwell	J. Marshall	J. McDevitt-Smith	S. Beck	G. Aldridge

Cover provided as needed by S. Lea