



Thurston CE Primary Academy Progression in Design and Technology Skills

Intent

At Thurston CE Primary Academy we value Design and Technology as an important part of the children's entitlement to a broad and balanced curriculum. We want to inspire our pupils to be innovative and creative thinkers who have an appreciation for the product design cycle through ideation, creation and evaluation. We want our pupils to develop the confidence to take risks, through drafting designs, modelling and testing; we want our pupils to be reflective learners who evaluate theirs and others' work. Through using KAPOW, we aim to build an awareness of the impact Design and Technology has on our lives. We ensure that there is a clear progression of skills and concepts as children move through the school, covering all the National Curriculum requirements; as pupils progress, they should be able to think critically and develop a more rigorous understanding of design and technology. Our pupils develop key design skills and concepts including: design, making, evaluating, technical knowledge and cooking and nutrition.

Implementation- How is Design and Technology taught at Thurston CE Primary Academy?

Our Design and Technology curriculum is based on the National Curriculum and supported by KAPOW ensuring a well-structured approach to this creative subject. It focuses on developing the children's skills through weekly art lessons over each half term in KS2 and a blocked DT week over each half term in KS1 which is linked to the topic of the term where possible. Our Design and Technology curriculum alternates with our Art and Design curriculum on a half termly basis; there will also be additional opportunities to engage with Design and technology opportunities throughout the year. Currently our Design and technology curriculum is taught on a two-year rolling programme throughout Key Stage 1 and 2.

The KAPOW DT scheme is designed with 5 key areas: mechanisms, structures, textiles, cooking and nutrition and electrical systems (KS2). Each key area follows the design process (design, make and evaluate) and key skills are revisited with increasing complexity as the children move through year groups allowing pupils to revise and build on previous learning.

The way DT is taught ensures that children are supported and challenged appropriately. Our lessons incorporate a range of teaching strategies including independent tasks, paired and group work and practical hands-on and computer-based tasks. The use of our brand new technical classroom helps to immerse the children in their practical lessons. Key skills and key knowledge for DT have been mapped across the school (this progression of skills document) to ensure skills and knowledge are taught progressively from year group to year group

Impact

By the end of their time with us, we want pupils to have learned, improved and embedded a range of design and technology skills. Children should understand the properties of a range of materials and resources, be able to use a range of tools, apply the principles of healthy eating, diets and recipes, have an appreciation for key individuals, inventions and events in history that impact our world and be able to self-evaluate and reflect on their learning. We strive to prepare children to take part in the development of tomorrow's rapidly changing world and aim to encourage children to become creative problem-solvers, both as individuals and as part of a team.

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	EYFS	Key Stage 1	Key Stage 2
National Curriculum	<p>ELG: Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function</p> <p>Share their creations, explaining the process they have used.</p> <p>Make use of props and materials when role-playing characters in narratives and stories</p>	<p>Pupils should be taught about:</p> <ul style="list-style-type: none"> • 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 • 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 • Explore and evaluate a range of existing products • Evaluate their ideas and products against design criteria • 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. • Use the basic principles of a healthy and varied diet to prepare dishes • Understand where food comes from. 	<p>Pupils should be taught about:</p> <ul style="list-style-type: none"> • 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 • 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 • 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 • 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. • 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.

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	EFYS	Year 1/2		Year 3/4		Year 5/6	
Design	<p>Develop own ideas through experimentation with diverse materials to express & communicate their discoveries & understanding</p> <p>Create collaboratively sharing ideas, resources & skills Hold conversation when engaged in back-and-forth exchanges with</p> <p>Hold conversation when engaged in back-and-forth exchanges with</p> <p>Set and work towards simple goals, being able to wait for what they want and control their immediate impulses when appropriate.</p>	<p>Cooking and nutrition Understanding the difference between fruits and vegetables. Describing and grouping fruits by texture and taste. *</p> <p>Mechanisms: Designing a moving story book for a given audience. Creating clearly labelled drawings which illustrate movement**</p> <p>Textiles: Using a template to create a design for a puppet ***</p>	<p>Cooking and nutrition: Understanding what makes a balanced diet. Knowing where to find the nutritional information on packaging. Knowing the five food groups**</p> <p>Mechanisms: Designing a wheel. Selecting appropriate materials based on their properties *</p> <p>Structures: Generating and communicating ideas using sketching and modelling . Learning about different types of structures, found in the natural world and in everyday objects***</p>	<p>Textiles: Designing and making a template from an existing cushion and applying individual design criteria. *</p> <p>Food: Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish. **</p> <p>Structures: Designing a castle with key features to appeal to a specific person/purpose. Drawing and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials need and colours. Designing and/or decorating a castle tower on CAD software. ***</p>	<p>Mechanisms: Designing a shape that reduces air resistance. Drawing a net to create a structure from. Choosing shapes that increase or decrease speed as a result of air resistance. Personalising a design. *</p> <p>Electrical Systems: Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas. **</p> <p>Cooking and Nutrition: Designing a biscuit within a given budget, drawing upon previous taste testing. ***</p>	<p>Mechanisms: Designing a pop-up book which uses a variety of structures and mechanisms. Naming each mechanism, input and output accurately. Storyboarding ideas for a book. ***</p> <p>Cooking and nutrition: Adapting a traditional recipe; understanding the nutritional value of a recipe alters if you remove, substitute or add additional ingredients. Writing an amended method for a recipe to incorporate the appropriate changes. Designing appealing packaging. **</p> <p>Textiles: Designing a stuffed toy considering the main component shapes required and creating an appropriate template. Considering the proportions of individual components. *</p>	<p>Structures: Designing a stable structure that is able to support weight. Creating a frame structure with focus on triangulation. **</p> <p>Electrical systems: Designing a steady hand game - identifying and naming the components required. Drawing a design from different perspectives. Generating ideas through sketching and discussion. Modelling ideas through prototypes. Understanding the purpose of products - fit for purpose. ***</p> <p>Cooking and nutrition: Writing a recipe, explaining the key steps, method and ingredients. Including facts and drawings from research undertaken. *</p>

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	-Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary.						
Make	<p>Use increasing knowledge & understanding of tools & materials to explore their interests & enquiries & develop their thinking</p> <p>Create representations both imaginary & real-life ideas, events, people & objects</p> <p>Be confident to try new activities and show independence, resilience and perseverance in the face of challenge.</p> <p>Use a range of small tools, including scissors, paintbrushes and</p>	<p>Mechanisms: Following a design to create moving models that use levers and sliders. Adapting mechanisms**</p> <p>Textiles: Cutting fabric neatly with scissors. Using joining methods to decorate a puppet. Sequencing steps for construction***</p> <p>Cooking and nutrition: Chopping fruit and vegetables safely to make a smoothie. Identifying if a food is a fruit or a vegetable. Learning where and how fruits and vegetables grow *</p>	<p>Mechanisms: Making linkages using card for levers and split pins for pivots. Experimenting with linkages adjusting the widths, lengths and thicknesses of card used . Cutting and assembling components neatly. Selecting materials according to their characteristics. Following a design brief. *</p> <p>Structures: Making a structure according to design criteria. Creating joints and structures from paper/card and tape***</p> <p>Cooking and nutrition: Slicing food safely using the bridge or claw grip. Constructing a wrap</p>	<p>Textiles: Designing and making a template from an existing cushion and applying individual design criteria *</p> <p>Food: Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination. Following the instructions within a recipe . **</p> <p>Structures: Constructing a range of 3D geometric shapes using nets. Creating special features for individual design. Making facades from a range of recycled materials ***</p>	<p>Mechanisms: Measuring, marking, cutting and assembling with increasing accuracy. Making a model based on a chosen design. *</p> <p>Electrical Systems: Making a torch with a working electrical circuit and switch. Using appropriate equipment to cut and attach materials. Assembling a torch according to the design and success criteria **</p> <p>Cooking and Nutrition: Following a baking recipe. Cooking safely, following basic hygiene rules. Adapting a recipe ***</p>	<p>Mechanical systems: Following a brief to make a pop-up book neatly and with accuracy. Making mechanisms using sliders, pivots and folds to produce movement. Using layers and spacers to hide the workings of mechanical parts for an ethically pleasing result. ***</p> <p>Cooking and nutrition: Cutting and preparing vegetables safely. Using equipment safely including: Knives, hot pans and hobs. Knowing how to avoid cross-contamination. Following a step by step recipe carefully. **</p>	<p>Structures: Making a range of different shaped beam bridges. Using triangles to create truss bridges. Building a wooden structure independently measuring and marking wood accurately. Selecting appropriate tools and equipment. Use the correct technique when sawing. Identifying where a structure needs strengthening. **</p> <p>Electrical systems: Making a stable base for a game. Accurately cutting and folding a net. Making and testing a circuit. Incorporating a circuit into a bse. ***</p> <p>Cooking and nutrition: Following a recipe using</p>

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	<p>cutlery.</p> <p>-Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</p> <p>-Share their creations, explaining the process they have used.</p>		<p>that meets a design brief**</p>			<p>Textiles: Creating a 3D stuffed toy from a 2D design.</p> <p>Measuring, marking and cutting fabric accurately and independently.</p> <p>Creating strong and secure blanket stitches.</p> <p>Using applique to attach pieces of fabric for decoration. *</p>	<p>the correct quantities of each ingredient.</p> <p>Adapting a recipe based on research.</p> <p>Working to a given timescale.</p> <p>Working safely and hygienically with independence. *</p>
Evaluation	<p>Express & communicates working theories, feelings & understandings</p> <p>Responds imaginatively to art works & objects</p> <p>Return to & build on previous learning, refining ideas & developing their ability to represent them</p> <p>Discuss problems & how they might be solved -</p>	<p>Mechanisms: Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed. Reviewing the success of a product by testing it with its intended audience.</p> <p>Testing mechanisms, identifying what stops wheels from turning, knowing. that a wheel needs an axle in order to move. **</p> <p>Textiles: Cutting fabric neatly with scissors. Using joining methods to decorate a puppet.</p>	<p>Mechanisms: Making linkages using card for levers and split pins for pivots. Experimenting with linkages adjusting the widths, lengths and thicknesses of card used . Cutting and assembling components neatly. Selecting materials according to their characteristics. Following a design brief.*</p> <p>Structures: Exploring the features of structures. Comparing the stability of different shapes. Testing the strength of own</p>	<p>Textiles: Evaluating an end product and thinking of other ways in which to create similar items. *</p> <p>Food: Establishing and using design criteria to help test and review dishes. Describing the benefits of seasonal fruits and vegetables and the impact on the environment. Suggesting points for improvement when making a seasonal tart. **</p>	<p>Mechanisms: Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance. *</p> <p>Electrical Systems: Evaluating electrical products. Testing and evaluating the success of a final product and taking inspiration from the work of peers. **</p> <p>Cooking and Nutrition: Evaluating a recipe, considering: taste,</p>	<p>Mechanical systems: Evaluating the work of others and receiving feedback on their own work. Suggesting points for improvements. ***</p> <p>Textiles: Testing and evaluating an end product and giving points for further improvement. *</p> <p>Cooking and nutrition: Identifying the nutritional difference between products and recipes. Identifying and describing healthy benefits of food groups. **</p>	<p>Structures: Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary. Suggesting improvements for own bridges and those designed by others. **</p> <p>Electrical systems: Testing own and others finished games, identifying what went well and making improvements for suggestions. Gathering images and information about existing children's toys.</p>

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	<p>Be confident to try new activities and show independence, resilience and perseverance in the face of challenge.</p> <p>Share their creations, explaining the process they have used.</p>	<p>Sequencing steps for construction***</p> <p>Cooking and nutrition: Tasting and evaluating different food combinations. Describing appearance, smell and taste. Suggesting information to be included on packaging*</p>	<p>structures. Identifying the weakest part of a structure. Evaluating the strength, stiffness and stability of own structure. ***</p> <p>Cooking and nutrition: Describing the taste, texture and smell of fruit and vegetables. Taste testing food combinations and final products. Describing the information that should be included on a label. Evaluating which grip was most effective**</p>	<p>Structures: Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design. Suggesting points for modification of the individual designs ***</p>	<p>smell, texture and appearance. Describing the impact of the budget on the selection of ingredients. Evaluating and comparing a range of products. Suggesting modifications ***</p>		<p>Analysing a selection of children's toys. ***</p> <p>Cooking and nutrition: Evaluating a recipe considering: taste, smell, texture and origin of the food group. Taste testing and scoring final products. Suggesting and writing up points of improvements in production. Evaluating health and safety measures to minimise cross-contamination. *</p>
<p>Technical knowledge</p>	<p>Use different techniques for joining materials</p> <p>Use tools independently, with care & precision</p>	<p>Mechanisms: Learning that levers and sliders are mechanisms and can make things move. Identifying whether a mechanism is a lever or slider and determining what movement the mechanism will make. Using the vocabulary: up, down, left, right, vertical and horizontal to describe movement. Identifying what mechanism makes a toy or vehicle roll forwards.</p>	<p>Mechanisms: Learning that mechanisms are a collection of moving parts that work together in a machine. Learning that there is an input and output in a mechanism. Identifying mechanisms in everyday objects. Learning that a lever is something that turns on a pivot. Learning that a linkage is a system of levers that are connected by pivots. Exploring wheel mechanisms. Learning</p>	<p>Textiles: Threading needles with greater independence. Tying knots with greater independence. Sewing cross stitch and appliqué. Understanding the need to count the thread on a piece of evenweave fabric in each direction to create uniform size and appearance. Understanding that fabrics can be layered for affect. *</p>	<p>Mechanisms: Learning that products change and evolve over time. Learning that all moving things have kinetic energy. Understanding that kinetic energy is the energy that something (object person) has by being in motion. *</p> <p>Electrical Systems: Learning how electrical items work. Identifying electrical products.</p>	<p>Textiles: Learning how to sew a blanket stitch to join fabric. Applying blanket stitch so the spaces between the stitches are regular and even. Thread needles independently.</p> <p>Mechanical systems: Knowing that an input is the motion used to start a mechanism. Knowing that the output is the motion that happens as a result of starting the input.</p>	<p>Structures: Exploring how to create a strong beam. Understanding the terms compression and tension. Identifying stronger and weaker structures. Finding different way to reinforce structures. Understanding how triangles can be used to reinforce structures.</p> <p>Electrical systems: Learning that batteries contain acid which can</p>

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		<p>Learning that for a wheel to move it must be attached to an axle**</p> <p>Textiles: Learning different ways in which to join fabrics together: pinning, stapling, gluing***</p> <p>Cooking and nutrition: Understanding the difference between fruits and vegetables. Describing and grouping fruits by texture and taste: *</p>	<p>how axels help wheels to move a vehicle. *</p> <p>Structures: Identifying natural and man-made structures. Identifying when a structure is more or less stable than another. Knowing that shapes and structures with wide, flat bases or legs are the most stable. Understanding that the shape of a structure affects its strength. Using the vocabulary: strength, stiffness and stability. Knowing that materials can be manipulated to improve strength and stiffness. Building a strong and stiff structure by folding paper. ***</p> <p>Cooking and nutrition: Understanding what makes a balanced diet. Knowing where to find the nutritional information on packaging . Knowing the five food groups**</p>	<p>Food: Learning that climate affects food growth. Working with cooking equipment safely and hygienically. Learning that imported foods travel from far away and this can negatively impact the environment. Learning that vegetables and fruit grow in certain seasons. Learning that each fruit and vegetable gives us nutritional benefits. Learning to use, store and clean a knife safely **</p> <p>Structures: Identifying features of a castle. Identifying suitable materials to be selected and used for a castle, considering weight, compression, tension. Extending the knowledge of wide and flat based objects are more stable. Understanding the terminology of strut, tie, span, beam.</p>	<p>Learning what electrical conductors and insulators are. Understanding that a battery contains stored electricity and can be used to power products. Identifying the features of a torch. Understanding how a torch works. Articulating the positives and negatives about different torches. **</p> <p>Cooking and Nutrition: Understanding the impact of the cost and importance of budgeting while planning ingredients for biscuits. Understanding the environmental impact on future product and cost of production. ***</p>	<p>Knowing that mechanisms control movement.</p> <p>Cooking and nutrition: Understanding where food comes from. Understanding what constitutes a balanced diet. Learning to adapt a recipe to make it healthier. Comparing two adapted recipes using a nutritional calculator and then identify the healthier option.</p>	<p>be dangerous if they leak. Identifying and naming the circuit components in a steady hand game. Cooking and nutrition: Learning how to research a recipe by ingredient. Recording the relevant ingredients and equipment needed for a recipe. Understanding the combination of food that will complement each other. Understanding where food comes from, describing the process of farm to fork for a given ingredient.</p>
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				Understanding the difference between frame and shell structure. ***			
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- * Covered Autumn Term
- ** Covered Spring Term
- *** Covered Summer Term

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