

Primary Phase Long Term Plan

Design Technology (DT)



William Hulme's Grammar School
The best in everyone™
Part of United Learning

Overview

The foundations of our Design and Technology curriculum are based upon The National Curriculum (2014) and the projects are taught termly through 'Projects on a Page', produced by The Design and Technology Association.

There are **six key principles** that shape our curriculum intent in DT, these are:

Entitlement- every pupil has the right to learn all aspects of the curriculum.

Coherence- learning is built upon term by term, as well as year-on-year.

Adaptability- our curriculum is adapted, where necessary, to suit the needs or interests of our pupils.

Representation- a diverse and inclusive curriculum is provided, in which pupils see themselves.

Mastery- providing depth to learning.

Education with Character- opportunities to nurture pupils Spiritual, Moral, Social, Cultural (SMSC) needs are created- where possible.

Running through the curriculum are five vertical concepts that enable children to make connections between projects, developing their skills and knowledge. These concepts are: **Mechanisms/Mechanical Systems, Food, Textiles, Structures and Electrical Systems**. Through these projects, children are continuously building upon previously taught skills, which have been mapped across the school to ensure progression between year groups/key stages and to make links with other wider curriculum areas where possible.

Pupils design and make products that solve real and relevant problems within a variety of contexts. Food technology is also implemented across the school with children developing an understanding of where food comes from, the importance of a varied and healthy diet and how to prepare this. Design and technology lessons are taught as a block, so that children's learning is focused throughout each unit of work. Pupils will build knowledge through the projects and at the start and end of the unit, complete a pre and post learning quiz to show their progress.

We ensure the children:

- 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 in order 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.

Vertical Concept Overview

Vertical Concept	Key Questions/Definition	Units
Mechanisms/ Mechanical	<p><u>Design</u> How do wheels and axles work together? How do levers and linkage mechanisms work? What is a fixed and loose pivot? What are pneumatic mechanisms?</p> <p><u>Make</u> What tools will we need? What skills will we need to learn/develop?</p> <p><u>Evaluate</u> Did our final product meet the original criteria? Did we follow our design?</p>	<p>Year 1: Sliders and Levers Year 2: Wheels and Axles Year 3: Levers and Linkages Year 4: Pneumatics Year 5: Pulleys or Gears Year 6: Cams</p>
Food	<p><u>Design</u> What is a healthy and varied diet? Where do our ingredients come from?</p> <p><u>Make</u> What utensils and equipment will we need? What skills will we acquire/improve?</p> <p><u>Evaluate</u> Does our final product meet the design brief and specification?</p>	<p>Year 1: Preparing Fruit and Vegetables Year 2: Preparing Fruit and Vegetables Year 3: Health and Varied Diet Year 5: Celebrating Culture and Seasonality</p>
Textiles	<p><u>Design</u> What joining techniques are there to join fabrics? What fastenings can we use?</p> <p><u>Make</u> What tools will we need? What skills will we need to learn/develop?</p> <p><u>Evaluate</u> Did our final product meet the original criteria? Did we follow our design?</p>	<p>Year 1: Templates and Joining Techniques Year 4: 2D Shape to 3D Product Year 6: Combining Different Fabric Shapes</p>
Structures	<p><u>Design</u> What structures do we know? How are they strengthened and functional? How can we construct a strong, stiff, functional structure?</p> <p><u>Make</u> What tools will we need? What skills will we need to learn/develop?</p> <p><u>Evaluate</u> Did our final product meet the original criteria? Did we follow our design?</p>	<p>Year 2: Freestanding Structures Year 3: Shell Structures (nets) Year 5: Frame Structures</p>
Electrical Systems	<p><u>Design</u> How does an electric circuit work? What affects bulb brightness, buzzer volume, voltage & circuit symbols?</p> <p><u>Make</u> What tools will we need? What skills will we need to learn/develop?</p> <p><u>Evaluate</u> Did our final product meet the original criteria? Did we follow our design?</p>	<p>Year 4: Simple Programming and Control Year 6: Monitoring and Control</p>

Early Years

	Nursery	Reception	Assessment
Autumn Term	<p>Unit: Marvellous Me/It's Getting Cold Outside</p> <p>Area of Learning: Expressive Arts and Design</p> <p>Overview:</p> <ul style="list-style-type: none"> • Create textured animal pictures, selecting their own materials. Add bedding and shelters for the hibernating animals. • Make Christmas decorations, cards and wrapping paper. 	<p>Unit: Me and My World/My Heroes</p> <p>Area of Learning: Expressive Arts and Design</p> <p>Overview:</p> <ul style="list-style-type: none"> • Using plasticine to create faces including different features, i.e. curly/straight hair. • Create 3d models using different materials. • Use joining materials to make moving parts (split pins/paper clips/treasure tags) 	<ul style="list-style-type: none"> • Individual and group observations • Formative assessments through observations or planned activities during every lesson including have a go hedgehog (group work and assessment), verbal interaction, and focus children observations.

	Nursery	Reception	Assessment
Spring Term	<p>Unit: On the Move/ On the Farm</p> <p>Area of Learning: Expressive Arts and Design</p> <p>Overview:</p> <ul style="list-style-type: none"> • Create 3d models of vehicles using Junk modelling using glue and cellotape • Create houses for the animals using constructions blocks and small world resources • Use small construction to make wheeled vehicles. • Use cutlery to prepare and taste fruit and vegetables. 	<p>Unit: Castles/Knights and Dragons/Spring in our Step</p> <p>Area of Learning: Expressive Arts and Design</p> <p>Overview:</p> <ul style="list-style-type: none"> • Using plasticine to create Dragons and the different parts of flowers using correct colours • Reinforce language such, castle, tower, turret, stone, bricks, drawbridge, portcullis, moat, hill. 	<ul style="list-style-type: none"> • Individual and group observations • Formative assessments through observations or planned activities during every lesson including have a go hedgehog (group work and assessment), verbal interaction, and focus children observations.

	Nursery	Reception	Assessment
Summer Term	<p>Unit: Once upon a time/All Creatures Great and Small</p> <p>Area of Learning: Expressive Arts and Design</p> <p>Overview:</p> <ul style="list-style-type: none"> • Create 3d models of homes for the pigs. • Use different joining materials to make caterpillars. • Create playdough sculptures of minibeasts. • Bake biscuits 	<p>Unit: Where We Live/Science Detectives</p> <p>Area of Learning: Expressive Arts and Design</p> <p>Overview:</p> <ul style="list-style-type: none"> • Using 3D materials to create houses manipulating the materials to create windows/doors/rooves. • Use natural materials to create different houses around the world. 	<ul style="list-style-type: none"> • Individual and group observations • Formative assessments through observations or planned activities during every lesson including have a go hedgehog (group work and assessment), verbal interaction, and focus children observations.

Key Stage One

	Year 1	Year 2	Assessment
Autumn Term	<p>Unit: Preparing Fruit and Vegetables Vertical Concept: Food Finished Project: Fruit Kebab for Year 1 child</p> <p>Designing</p> <ul style="list-style-type: none"> Design appealing products for a particular user based on simple design criteria. Investigate a variety of fruit and vegetables. <p>Making</p> <ul style="list-style-type: none"> Use simple utensils and equipment to e.g., peel, cut, slice and chop safely. Select from a range of fruit and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product. <p>Evaluating</p> <ul style="list-style-type: none"> Taste and evaluate a range of fruit and vegetables to determine the intended user's preferences. Evaluate ideas and finished products against design criteria 	<p>Unit: Preparing Fruit and Vegetables Vertical Concept: Food Finished Project: Fruit Smoothie for a Class Party</p> <p>Designing</p> <ul style="list-style-type: none"> Design appealing products for a particular user based on simple design criteria. investigate a variety of fruit and vegetables. <p>Making</p> <ul style="list-style-type: none"> Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely. Select from a range of fruit and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product. <p>Evaluating</p> <ul style="list-style-type: none"> Taste and evaluate a range of fruit and vegetables to determine the intended user's preferences. Evaluate ideas and finished products against design criteria 	<ul style="list-style-type: none"> Formative assessments during every lesson include: Review, verbal feedback, a range of questioning techniques and mini whiteboard tasks. Year 1 will self and peer assess their fruit kebab Year 2 will self and peer assess their fruit smoothie

	Year 1	Year 2	Assessment
Spring Term	<p>Unit: Sliders and Levers Vertical Concept: Mechanisms Finished Project: Moving Story Book for a Reception Child</p> <p>Designing</p> <ul style="list-style-type: none"> Generate ideas based on simple design criteria Develop, model and communicate their ideas through drawings and mock-ups with card and paper. <p>Making</p> <ul style="list-style-type: none"> Plan by suggesting what to do next. Select and use tools, explaining their choices, to cut, shape and join paper and card. 	<p>Unit: Wheels and Axles Vertical Concept: Mechanisms Finished Project: Model Fire Engine for a Reception Child</p> <p>Designing</p> <ul style="list-style-type: none"> Generate initial ideas and simple design criteria Develop and communicate ideas through drawings and mock-ups. <p>Making</p> <ul style="list-style-type: none"> Select from and use a range of tools and equipment to perform practical tasks such as cutting and joining to allow movement and finishing. 	<ul style="list-style-type: none"> Formative assessments during every lesson include: Review, verbal feedback, a range of questioning techniques and mini whiteboard tasks. Year 1 will self and peer assess their moving story book Year 2 will self and peer assess their fire engine

Spring Term	<p>Evaluating</p> <ul style="list-style-type: none"> • Explore a range of existing books and everyday products that use simple sliders and levers. • Evaluate their product by discussing how well it works in relation to the purpose and design criteria. 	<ul style="list-style-type: none"> • Select and use a range of materials and components such as paper, card, plastic and wood according to their characteristics. <p>Evaluating</p> <ul style="list-style-type: none"> • Explore and evaluate a range of products with wheels and axles. • Evaluate their ideas throughout and their products against original criteria. 	
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	Year 1	Year 2	Assessment
Summer Term	<p>Unit: Templates and Joining Vertical Concept: Textiles Finished Project: A soft toy for a 5/6yr old</p> <p>Designing</p> <ul style="list-style-type: none"> • Design a functional and appealing product based on simple design criteria. • Develop, model and communicate their ideas through talking, mock-ups and drawings. <p>Making</p> <ul style="list-style-type: none"> • Select from and use a range of tools and equipment to perform practical tasks such as marking out, cutting, joining and finishing. <p>Evaluating</p> <ul style="list-style-type: none"> • Explore and evaluate a range of existing textile products relevant to the project being undertaken. • Evaluate their ideas throughout and their final products against original design criteria. 	<p>Unit: Freestanding Structures Vertical Concept: Structures Finished Project: A Bridge for pedestrians to cross a river.</p> <p>Designing</p> <ul style="list-style-type: none"> • Generate ideas based on simple design criteria • Develop, model and communicate their ideas through talking, mock-ups and drawings. <p>Making</p> <ul style="list-style-type: none"> • Select and use tools, skills and techniques, explaining their choices. • Select new and reclaimed materials and construction kits to build their structures. • Use simple finishing techniques suitable for the structure they are creating. <p>Evaluating</p> <ul style="list-style-type: none"> • Explore a range of existing freestanding structures in the school and local environment e.g. everyday products and buildings. • Evaluate their product by discussing how well it works in relation to the original design brief. 	<ul style="list-style-type: none"> • Formative assessments during every lesson include: Review, verbal feedback, a range of questioning techniques and mini whiteboard tasks. • Year 1 will self and peer assess their soft toy • Year 2 will self and peer assess their bridge

Lower Key Stage Two

	Year 3	Year 4	Assessment
Autumn Term	<p>Unit: Shell Structures (nets) Vertical Concept: Structures Finished Project: A Memory Box for a family member</p> <p>Designing</p> <ul style="list-style-type: none"> • Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and purpose of the product. • Develop ideas through the analysis of existing products <p>Making</p> <ul style="list-style-type: none"> • Order the main stages of making. • Select and use appropriate tools to measure, mark out, cut, score, shape and assemble with some accuracy. • Explain their choice of materials according to functional properties and aesthetic qualities. • Use finishing techniques suitable for the product they are creating. <p>Evaluating</p> <ul style="list-style-type: none"> • Investigate and evaluate a range of existing shell structures • Test and evaluate their own products against design criteria and the intended user and purpose. 	<p>Unit 3-D Product Vertical Concept: Textiles Finished Project: Pencil Case, children to choose target audience</p> <p>Designing</p> <ul style="list-style-type: none"> • Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user(s). • Produce annotated sketches and final product sketches. <p>Making</p> <ul style="list-style-type: none"> • Plan the main stages of making. • Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing. • Select fabrics and fastenings according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern. <p>Evaluating</p> <ul style="list-style-type: none"> • Investigate a range of 3-D textile products relevant to the project. • Test their product against the original design criteria and with the intended user. • Consider others' views. 	<ul style="list-style-type: none"> • Formative assessments during every lesson include: Review, verbal feedback, a range of questioning techniques and mini whiteboard tasks. • Year 3 will self and peer assess their memory box • Year 4 will self and peer assess their pencil case.

	Year 3	Year 4	Assessment
Spring Term	<p>Unit: Mechanical Systems Vertical Concept: Levers and Linkages Finished Project: A Moving Birthday Card for a member of the family</p> <p>Designing</p> <ul style="list-style-type: none"> • Generate realistic ideas and their own design criteria • Use annotated sketches and prototypes to develop, model and communicate ideas. 	<p>Unit: Pneumatics Vertical Concept: Mechanical Systems Finished Project: Moving Monster Toy for Key Stage One child</p> <p>Designing</p> <ul style="list-style-type: none"> • Generate realistic and appropriate ideas and their own design criteria through discussion, focusing on the needs of the user. 	<ul style="list-style-type: none"> • Formative assessments during every lesson include: Review, verbal feedback, a range of questioning techniques and mini whiteboard tasks. • Year 3 will self and peer assess their birthday card • Year 4 will self and peer assess their toy

Making	<ul style="list-style-type: none"> Order the main stages of making. Select from and use appropriate tools with some accuracy to cut, shape and join paper and card. Select from and use finishing techniques suitable for the product they are creating. 	<ul style="list-style-type: none"> Use annotated sketches and prototypes to develop, model and communicate ideas. 	
Evaluating	<ul style="list-style-type: none"> Investigate and analyse books and, where available, other products with lever and linkage mechanisms. Evaluate their own products and ideas against criteria and user needs, as they design and make. 	<p>Making</p> <ul style="list-style-type: none"> Order the main stages of making. Select from and use appropriate tools with some accuracy to cut and join materials and components such as tubing, syringes and balloons. Select from and use finishing techniques suitable for the product they are creating. 	

	Year 3	Year 4	Assessment
Summer Term	<p>Unit: Healthy and Varied Diet Vertical Concept: Food Finished Project: A Greek Salad</p> <p>Designing</p> <ul style="list-style-type: none"> Generate and clarify ideas to develop design criteria including appearance, taste, texture and aroma for an appealing product for a particular user and purpose. Use annotated sketches and appropriate information and communication technology, such as web-based recipes, to develop and communicate ideas. <p>Making</p> <ul style="list-style-type: none"> Plan the main stages of a recipe, listing ingredients, utensils and equipment. Select and use appropriate utensils and equipment to prepare and combine ingredients. Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics. <p>Evaluating</p> <ul style="list-style-type: none"> Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs. Evaluate the final product with reference to the design criteria 	<p>Unit: Simple Programming and Control Vertical Concept: Electrical systems Finished Project: Torch, children to choose target audience.</p> <p>Designing</p> <ul style="list-style-type: none"> Gather information about users' needs and wants and develop design criteria to inform the design Generate, develop, model and communicate realistic ideas through discussion, sketches, and exploded diagrams. <p>Making</p> <ul style="list-style-type: none"> Order the main stages of making. Select from and use tools and equipment to cut, shape, join and finish with some accuracy. Connect simple electrical components and a battery in a series circuit to achieve a functional outcome. Program a standalone control box, microcontroller, or interface box to enhance the way the product works. <p>Evaluating</p> <ul style="list-style-type: none"> Investigate and analyse a range of existing battery-powered products, including pre-programmed and programmable products. Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work. 	<ul style="list-style-type: none"> Formative assessments during every lesson include: Review, verbal feedback, a range of questioning techniques and mini whiteboard tasks. Year 3 will self and peer assess their Greek salad Year 4 will self and peer assess their torch.

Upper Key Stage Two

	Year 5	Year 6	Assessment
Autumn Term	<p>Unit: Celebrating Culture and Seasonality</p> <p>Vertical Concept: Food</p> <p>Finished Project: Bread, children to choose target audience.</p> <p>Designing</p> <ul style="list-style-type: none"> • Generate innovative ideas to develop a design brief and criteria for a design specification. • make design decisions to develop a final product linked to user and purpose. • Use words, annotated sketches and information and communication technology as appropriate to develop and communicate ideas. <p>Making</p> <ul style="list-style-type: none"> • Write a step-by-step recipe, including a list of ingredients, equipment and utensils • Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients. • Make, decorate and present the food product appropriately for the intended user and purpose. <p>Evaluating</p> <ul style="list-style-type: none"> • Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations using e.g. tables/ graphs/charts such as star diagrams. • Evaluate the final product with reference back to the design brief. • Understand how key chefs have influenced eating habits to promote varied and healthy diets. 	<p>Unit: Combining Different Fabric Shapes</p> <p>Vertical Concept: Textiles</p> <p>Finished Project: A Felt soft toy for a refugee child</p> <p>Designing</p> <ul style="list-style-type: none"> • Generate innovative ideas by carrying out research • Develop, model and communicate ideas through talking, drawing, templates, mock-ups and prototypes and, where appropriate, computer-aided design. • Design purposeful, functional, appealing products based on a simple design specification. <p>Making</p> <ul style="list-style-type: none"> • Produce detailed lists of equipment and fabrics relevant to their tasks. • Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • Select from and use a range of tools and equipment to make products that are accurately assembled and well finished. Work within the constraints of time, resources and cost. <p>Evaluating</p> <ul style="list-style-type: none"> • Investigate and analyse textile products linked to their final product. • Compare the final product to the original design specification. • Test products with intended user and critically evaluate 	<ul style="list-style-type: none"> • Formative assessments during every lesson include: Review, verbal feedback, a range of questioning techniques and mini whiteboard tasks. • Year 5 will self and peer assess their bread • Year 6 will self and peer assess their toy

		Year 5	Year 6	Assessment
Spring Term		<p>Unit: Frame Structures Vertical Concept: Structures Finished Project: Photo Frame, children to choose target audience</p> <p>Designing</p> <ul style="list-style-type: none"> Carry out research into user needs and existing products, Develop a simple design specification, taking account of constraints including time, resources, and cost. Generate, develop, and model innovative ideas, through discussion, prototypes and annotated sketches. <p>Making</p> <ul style="list-style-type: none"> Formulate a clear plan, including a step-by-step list of implementations and a lists of resources select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks. Use finishing and decorative techniques suitable for the product <p>Evaluating</p> <ul style="list-style-type: none"> Investigate and evaluate a range of existing frame structures. Critically evaluate their products against their design specification, Research key events and individuals relevant to frame structures. 	<p>Unit: Monitoring and Control Vertical Concept: Electrical Systems Finished Project: Night light for Early Year's child</p> <p>Designing</p> <ul style="list-style-type: none"> Develop a design specification for a functional product that responds automatically to changes in the environment. Generate, develop, and communicate ideas through discussion, annotated sketches and pictorial representations of electrical circuits or circuit diagrams. <p>Making</p> <ul style="list-style-type: none"> Formulate a step-by-step plan to guide making, listing tools, equipment, materials, and components. Select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product. Create and modify a computer control program to enable their electrical product to respond to changes in the environment. <p>Evaluating</p> <ul style="list-style-type: none"> Continually evaluate and modify the working features of the product to match the initial design specification. Test the system to demonstrate its effectiveness for the intended user and purpose. 	<ul style="list-style-type: none"> Formative assessments during every lesson include: Review, verbal feedback, a range of questioning techniques and mini whiteboard tasks. Year 5 will self and peer assess their photo frame Year 6 will self and peer assess their night light

		Year 5	Year 6	Assessment
Summer Term		<p>Unit: Pulleys or Gears Vertical Concept: Mechanical Systems Finished Project: Class Fairground Ride with pulley/gear mechanism</p> <p>Designing</p> <ul style="list-style-type: none"> Generate innovative ideas by carrying out research Develop a simple design specification to guide their thinking. 	<p>Unit: Cams Vertical Concept: Mechanical Systems Finished Project: Moving Wooden Animal to sell for charity</p> <p>Designing</p> <ul style="list-style-type: none"> Generate innovative ideas by carrying out research Develop a simple design specification to guide their thinking. 	<ul style="list-style-type: none"> Formative assessments during every lesson include: Review, verbal feedback, a range of questioning techniques and mini whiteboard tasks. Year 5 will self and peer assess their class fairground Year 6 will self and peer assess their animals

	<ul style="list-style-type: none"> • Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views. <p>Making</p> <ul style="list-style-type: none"> • Produce detailed lists of tools, equipment, and materials • Formulate step-by-step plans and allocate tasks within a team. • Select and use a range of tools and equipment to make. • Work within the constraints of time, resources and cost. <p>Evaluating</p> <ul style="list-style-type: none"> • Compare the final product to the original design specification. • Test products with intended user • Consider the views of others to improve their work. • Investigate famous manufacturing and engineering companies relevant to the project. 	<ul style="list-style-type: none"> • Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views. <p>Making</p> <ul style="list-style-type: none"> • Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished. • Work within the constraints of time, resources and cost. <p>Evaluating</p> <ul style="list-style-type: none"> • Compare the final product to the original design specification. • Test products with intended user • Consider the views of others to improve their work. • Investigate famous manufacturing and engineering companies relevant to the project. 	
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Useful Resources for Supporting Your Child at Home:	Homework ideas:
KS1 and KS2 home learning teaching resources (theiet.org) Hands-on science and art projects KiwiCo Technology & Engineering for Kids - Fun Kids - Omny.fm Learning the basics for kids - BBC Food A guide to cookery skills by age BBC Good Food	<ul style="list-style-type: none"> • Continue to practice the skills learnt in DT at home such as sewing and chopping. • Replicate the recipes made in school. • Make an information poster/leaflet about your current unit. • Make a video of you explaining your learning for others.