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	**Design** 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? **Make** What tools will we need? What skills will we need to learn/develop? **Evaluate** Did our final product meet the original criteria? Did we follow our design?	**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
Food	**Design** What is a healthy and varied diet? Where do our ingredients come from? **Make** What utensils and equipment will we need? What skills will we acquire/improve? **Evaluate** Does our final product meet the design brief and specification?	**Year 1:** Preparing Fruit and Vegetables **Year 2:** Preparing Fruit and Vegetables **Year 3:** Health and Varied Diet **Year 5:** Celebrating Culture and Seasonality
Textiles	**Design** What joining techniques are there to join fabrics? What fastenings can we use? **Make** What tools will we need? What skills will we need to learn/develop? **Evaluate** Did our final product meet the original criteria? Did we follow our design?	**Year 1:** Templates and Joining Techniques **Year 4:** 2D Shape to 3D Product **Year 6:** Combining Different Fabric Shapes
Structures	**Design** What structures do we know? How are they strengthened and functional? How can we construct a strong, stiff, functional structure? **Make** What tools will we need? What skills will we need to learn/develop? **Evaluate** Did our final product meet the original criteria? Did we follow our design?	**Year 2:** Freestanding Structures **Year 3:** Shell Structures (nets) **Year 5:** Frame Structures
Electrical Systems	**Design** How does an electric circuit work? What affects bulb brightness, buzzer volume, voltage & circuit symbols? **Make** What tools will we need? What skills will we need to learn/develop? **Evaluate** Did our final product meet the original criteria? Did we follow our design?	**Year 4:** Simple Programming and Control **Year 6:** Monitoring and Control

Early Years

	Nursery	Reception	Assessment
Autumn Term	**Unit:** Marvellous Me/It's Getting Cold Outside **Area of Learning:** Expressive Arts and Design **Overview:** • Create textured animal pictures, selecting their own materials. Add bedding and shelters for the hibernating animals. • Make Christmas decorations, cards and wrapping paper.	**Unit:** Me and My World/My Heroes **Area of Learning:** Expressive Arts and Design **Overview:** • 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/treasury tags	• 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.
Spring Term	**Unit:** On the Move/ On the Farm **Area of Learning:** Expressive Arts and Design **Overview:** • 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.	**Unit:** Castles/Knights and Dragons/Spring in our Step **Area of Learning:** Expressive Arts and Design **Overview:** • 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.	• 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.
Summer Term	**Unit:** Once upon a time/All Creatures Great and Small **Area of Learning:** Expressive Arts and Design **Overview:** • Create 3d models of homes for the pigs. • Use different joining materials to make caterpillars. • Create playdough sculptures of minibeasts. • Bake biscuits	**Unit:** Where We Live/Science Detectives **Area of Learning:** Expressive Arts and Design **Overview:** • Using 3D materials to create houses manipulating the materials to create windows/doors/rooves. • Use natural materials to create different houses around the world.	• 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	**Unit: Preparing Fruit and Vegetables** **Vertical Concept:** Food **Finished Project**: Fruit Kebab for Year 1 child **Designing** • Design appealing products for a particular user based on simple design criteria. • Investigate a variety of fruit and vegetables. **Making** • 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. **Evaluating** • Taste and evaluate a range of fruit and vegetables to determine the intended user's preferences. • Evaluate ideas and finished products against design criteria	**Unit: Preparing Fruit and Vegetables** **Vertical Concept:** Food **Finished Project:** Fruit Smoothie for a Class Party **Designing** • Design appealing products for a particular user based on simple design criteria. • investigate a variety of fruit and vegetables. **Making** • 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. **Evaluating** • Taste and evaluate a range of fruit and vegetables to determine the intended user's preferences. • Evaluate ideas and finished products against design criteria	• 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	**Unit:** Sliders and Levers **Vertical Concept**: Mechanisms **Finished Project:** Moving Story Book for a Reception Child **Designing** • Generate ideas based on simple design criteria • Develop, model and communicate their ideas through drawings and mock-ups with card and paper. **Making** • Plan by suggesting what to do next. • Select and use tools, explaining their choices, to **cut, shape and join paper and card.**	**Unit:** Wheels and Axles **Vertical Concept**: Mechanisms **Finished Project**: Model Fire Engine for a Reception Child **Designing** • Generate initial ideas and simple design criteria • Develop and communicate ideas through drawings and mock-ups. **Making** • Select from and use a range of tools and equipment to perform practical tasks such **as cutting and joining to allow movement and finishing.**	• 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	**Evaluating** • 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.	• Select and use a range of materials and components such as paper, card, plastic and wood according to their characteristics. **Evaluating** • Explore and evaluate a range of products with wheels and axles. • Evaluate their ideas throughout and their products against original criteria.	

	Year 1	Year 2	Assessment
Summer Term	**Unit:** Templates and Joining **Vertical Concept**: Textiles **Finished Project:** A soft toy for a 5/6yr old **Designing** • Design a functional and appealing product based on simple design criteria. • Develop, model and communicate their ideas through talking, mock-ups and drawings. **Making** • Select from and use a range of tools and equipment to perform practical tasks such as **marking out, cutting, joining and finishing**. **Evaluating** • 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.	**Unit:** Freestanding Structures **Vertical Concept**: Structures **Finished Project:** A Bridge for pedestrians to cross a river. **Designing** • Generate ideas based on simple design criteria • Develop, model and communicate their ideas through talking, mock-ups and drawings. **Making** • 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. **Evaluating** • 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.	• 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	**Unit:** Shell Structures (nets) **Vertical Concept**: Structures **Finished Project:** A Memory Box for a family member **Designing** • 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 **Making** • 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. **Evaluating** • Investigate and evaluate a range of existing shell structures • Test and evaluate their own products against design criteria and the intended user and purpose.	**Unit** 3-D Product **Vertical Concept**: Textiles **Finished Project:** Pencil Case, children to choose target audience **Designing** • 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. **Making** • 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. **Evaluating** • 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.	• 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	**Unit:** Mechanical Systems **Vertical Concept**: Levers and Linkages **Finished Project:** A Moving Birthday Card for a member of the family **Designing** • Generate realistic ideas and their own design criteria • Use annotated sketches and prototypes to develop, model and communicate ideas.	**Unit:** Pneumatics **Vertical Concept**: Mechanical Systems **Finished Project:** Moving Monster Toy for Key Stage One child **Designing** • Generate realistic and appropriate ideas and their own design criteria through discussion, focusing on the needs of the user.	• 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 • 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. **Evaluating** • 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.	• Use annotated sketches and prototypes to develop, model and communicate ideas. **Making** • 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	**Unit:** Healthy and Varied Diet **Vertical Concept**: Food **Finished Project:** A Greek Salad **Designing** • 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. **Making** • 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. **Evaluating** • 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	**Unit:** Simple Programming and Control **Vertical Concept:** Electrical systems **Finished Project:** Torch, children to choose target audience. **Designing** • 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. **Making** • 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. **Evaluating** • 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.	• 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	**Unit:** Celebrating Culture and Seasonality **Vertical Concept**: Food **Finished Project:** Bread, children to choose target audience. **Designing** • 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. **Making** • 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. **Evaluating** • 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.	**Unit:** Combining Different Fabric Shapes **Vertical Concept**: Textiles **Finished Project:** A Felt soft toy for a refugee child **Designing** • 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. **Making** • 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. **Evaluating** • 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	• 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	**Unit:** Frame Structures **Vertical Concept**: Structures **Finished Project:** Photo Frame, children to choose target audience **Designing** • 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. **Making** • 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 **Evaluating** • 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.	**Unit:** Monitoring and Control **Vertical Concept**: Electrical Systems **Finished Project:** Night light for Early Year's child **Designing** • 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. **Making** • 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. **Evaluating** • 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.	• 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	**Unit:** Pulleys or Gears **Vertical Concept**: Mechanical Systems **Finished Project:** Class Fairground Ride with pulley/gear mechanism **Designing** • Generate innovative ideas by carrying out research • Develop a simple design specification to guide their thinking. • Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views. **Making** • 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. **Evaluating** • 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.	**Unit:** Cams **Vertical Concept**: Mechanical Systems **Finished Project:** Moving Wooden Animal to sell for charity **Designing** • Generate innovative ideas by carrying out research • Develop a simple design specification to guide their thinking. • Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views. **Making** • 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. **Evaluating** • 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.	• 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

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	• 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.