Design and Technology

Curriculum map

Food Technology	Textiles	Resistant materials

Purpose of study

Design and technology is 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.

Aims

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 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.

	Autumn	Spring	Summer
F S	**DT early learning / FS learning opportunities** Product evaluations- look at how things work/ are made and examples in the environment eg bridges, cars, Design products and explain our ideas to others- eg. healthy pizza, Lego zoo Record eg draw ideas and label simply eg. outfit for a specific person/climate Learn safe use of a variety of tools and develop skills in their use with support where necessary. Eg knives for cooking, peelers for whittling, hammers, screwdrivers, sellotape dispenser, needle and thread, hole punch, scissors for cutting different materials, glue gun, Make products, evaluate and talk about how we could improve them.		
Year 1	**Once upon a time**	**Dinosaur Days**	**Olympics / Cornwall / Africa / Rainforests**
	Fruit Drinks ♣ Survey popular flavours for drinks ♣ Test commercial drinks to compare: colour, taste, mouth feel, cost ♣ Develop specification: "I want my drink to be:-" ♣ Describe commercial drinks tasted ♣ Develop word bank eg fizzy, sour and use to label diagrams Explain to class how drinks were made ♣ Explore increasing range of fruits ♣ Use equipment safely ♣ Cut foods with knife	**Puppets** ♣ Investigate glove puppets ♣ Use squared paper to draw front and back views of puppet ♣ use of simple ICT drawing package ♣ Develop templates/patterns ♣ Explore structure of fabrics using microsc ♣ opes and magnifying glasses ♣ Investigate ways of joining fabrics ♣ Use scissors to cut accurately ♣ Use needles to stitch and join ♣ Explore Punch and Judy theatre ♣ Perform using puppets	Commercial Vehicle ♣ Research commercial vehicles ♣ Design and make a working vehicle suitable for a particular purpose ♣ Discuss and list the main features which vehicle should have ♣ Sort and classify a wide range of found materials ♣ Discuss the key features of commercial vehicles ♣ Consider how the vehicle will move: (wheels, axles, chassis…) ♣ Consider how to make moving parts on the vehicle ♣ Make a chassis ♣ Investigate a range of suitable glues (PVA, sticky tape, double sided tape, double sided pads, low temperature glue pot) ♣ Cut and join reclaimed materials
Year 2	**Food and festivals**	**Stone age Man**	**Olympics / Cornwall / Africa / Rainforests**
	Sandwiches ♣ Discuss what makes a good sandwich ♣ Suggest fillings for sandwiches ♣ Discuss what needs to be done first and order activities of making ♣ Draw simple illustration of fillings for sandwiches ♣ Explore Foods for health ♣ Identify resources needed for making Suggest order of making and layering of fillings ♣ Safe use of knives, graters etc ♣ Compare costs of homemade sandwiches with purchased ones	**A Bag for the Postman (hunter gatherer)** ♣ Research features of a post bag ♣ Develop the specification of existing postbags ♣ Test post bag in use ♣ Discuss ideas for the post bag ♣ Draw labelled sketches of bags on squared ♣ Talk about the order of making ♣ Test textiles for strength, absorbency and reflection ♣ Test fasteners for strength ♣ Cut textiles ♣ Select method of gluing and/or stitching to join ♣ Select type of fastening ♣ Simple costing of materials	**Magnetic Maze** ♣ Investigate a range of magnetic games ♣ Consider safety aspects of toys ♣ Make a full size plan drawing on squared paper of maze ♣ Use of coloured finishes to improve the appearance of the toy ♣ Experiment with magnets ♣ Saw strip wood ♣ Cut sheet materials - card and correx ♣ Glue strips of wood onto card drawing ♣ Use of corner reinforcements to strengthen a structure

Year 3	**Chocolate**	**Super sea sides**	**Olympics / Cornwall / Africa / Rainforests**
	Bone Builder Drinks (Chocolate Milk?) ♣ Investigate sugary drinks ♣ Investigate nutrition qualities of milk ♣ Compare full cream and skimmed milk ♣ Develop design brief ♣ Evaluate against specification ♣ Make annotated drawings to show ingredients and quantities ♣ Use descriptive words to evaluate products ♣ Investigate range of flavourings ♣ Combining foods of different textures to give desired result ♣ Selection of equipment for mixing ♣ Use liquidiser safely ♣ Work hygienically, keeping milk cool	**Sandals and Shoes** ♣ Investigate parts of a shoe ♣ Evaluate a range of sandals and shoes ♣ Make labelled cross section drawings ♣ Draw annotated sketches to show materials, features ♣ Explore and draw parts of the feet ♣ Make accurate foot template on squared paper to model and shape shoe upper and sole ♣ Selection textiles and appropriate fastenings ♣ Use of eyelet and punch ♣ Use range of glues and other joining techniques	**Toothbrushes** ♣ Make accurate and detailed drawings of the side and plan views of the brush (produce drawing on graph paper) ♣ Produce a series of drawings to show how teeth should be brushed - use templates ♣ Draw nets to make a box to package the model toothbrush ♣ Carefully consider the ergonomics of a toothbrush ie how it fits your hand and your teeth ♣ Look at the visual differences of brushes designed for adults compared with those designed for children ♣ Investigate toothbrush materials ♣ Find out how toothbrushes are manufactured ♣ Make and package toothbrush appropriately ♣ Find out the history of toothbrushes ♣ Compare costs of various brushes ♣ Work out best value, ie cost of brush compared to its effectiveness ♣ Look at the advertising associated with toothbrushes ♣ Consider environmental aspects of disposable plastic toothbrushes
Year 4	**Awesome Oceans**	**Romans / Healthy Me**	**Olympics / Cornwall / Africa / Rainforests**
	Money Holders ♣ Collect, sketch and evaluate a range of wallets/money holders ♣ Develop personal specification "I want to make a wallet that is ....." ♣ Draw annotated sketches of ideas ♣ Make a working drawing on squared paper to produce model/pattern. ♣ Make prototype shape and compartments in paper ♣ Plan and record sequence of making ♣ Consider how money holder may be personalised - logo ♣ Research and select suitable fabrics and fastenings ♣ Select, cut and join materials to make money holder ♣ Consider how wallets and purses have changed over time with coin sizes, notes, credit cards.	**Yummy Yoghurt Factory** ♣ Evaluate commercial yoghurts ♣ Investigate popular flavours ♣ Use charts or spreadsheets to present investigations ♣ Develop specification ♣ Make yoghurt ♣ Understand nutrition benefits of yoghurt and health problems associated with sugar ♣ Prepare fruits flavourings hygienically ♣ Design and make packaging and labels ♣ What information must a label show?	**Space Torch (science – circuits link)** ♣ Make observational drawings of torches - front, side and plan views ♣ Look at shapes, materials, forms and colours associated with torches ♣ Investigate shapes that are 'nice'/easy to hold – ergonomics ♣ Experiment with circuits and switches ♣ Experiment with reflective materials and coloured cellophane ♣ Cut and adapt and join found/junk materials ♣ Make annotated drawing of completed torch

Year 5	**Frozen**	**Invasion**	**Olympics / Cornwall / Africa / Rainforests**
	Ice cream ♣ Design and make a unique ice cream flavour ♣ Research and graph favourite ice cream flavours – use ICT survey software ♣ Investigate a range of ice cream products and flavours ♣ Brainstorm preferred flavours and begin to make link to combinations of flavours ♣ Consider health implications of sugar and cream ♣ Make annotated sketches using tonal shading of ice cream designs ♣ Consider presentation – toppings, sauces, wafers… ♣ Cost using online shopping tools ♣ Select a final design and make. ♣ Test and evaluate	**Gas Mask Holder** *(adapeted from DMV clothing for Stig)* ♣ Investigate WW2 and modern day gas masks ♣ Make annotated drawings which include measurements ♣ Make annotated drawings of historical gas mask holders and evaluate their effectiveness. Understand why gas mask boxes were made of cardboard (speed of production, cost, distribution…) ♣ Look at materials and compare with modern day materials – function, colours, fabrics, shapes, fastenings… ♣ Make annotated design sketches of suitable gas mask holder: How big, how will it be worn, handles, straps, catches, fastenings… ♣ Produce templates on squared paper which include accurate measuring ♣ Select textiles with properties to match item to be made: eg waterproof, reflective, comfort, stretch, Consider suitable colours: camouflage, fluorescent, reflective ♣ Join textiles by stitching and gluing to make gas mask holder ♣ Write a set of instructions about how to use your gas mask (Link to English/history)	**Powered vehicle** *(adapted from STEM project combined with DMC)* ♣ Develop a vehicle which can travel up a steep slope and in a straight line ♣ Link with Science: forces/pulleys making things go faster/slower, use of gearbox or pulleys to reduce speed and increase power of electric motors, size and width of wheels, friction ♣ Plan the order of making ♣ Construct 'Jinks' type frames ♣ Use wood pulleys and round lolly sticks for axles ♣ Make supports for electric motor ♣ Use hand drills and drill bits and wood saws ♣ Test vehicle and award points for how straight it travels and how steep a slope it can climb.
Year 6	**Ancient Egypt**	**SATs Revision**	**Olympics / Cornwall / Africa / Rainforests**
	Egyptian Jewellery *(adapted from year 4 DMC scheme)* ♣ Investigate Egyptian jewellery ♣ Make observational drawings of beetles, birds, shells, snakes ♣ Stylise shapes and forms from observational drawings ♣ Make annotated design drawings ♣ Experiment with new materials and processes: thermosetting plastic (Fimo), casting pewter, wire work ♣ Make and evaluate. Photograph with Egyptian make up ♣ Research spiritual aspects of Egyptian jewellery ♣ Consider the technical knowledge of the Egyptians ♣ Compare with techniques of today	*Stand-alone paper engineering / structures activities here:* *Eg:* ♣ *Design a bridge to span 70cm and support 500g* ♣ *Make the tallest tower* ♣ *Make a structure that will support 1kg 30 cm from the ground*	**Savoury Snacks** *(Year 6 DMC scheme)* *Investigate popular flavourings for biscuits* *• Group specification for biscuit to include:* *· economical to produce* *• Modify basic recipe to match specification* *• Test market final designs* *Present research data in chart/graph* *• Make small quantities to evaluate idea* *• Sequential drawings and instructions to show how biscuit production will be achieved* *• Adverts for biscuits* *Consider shapes and sizes* *• Investigate changes to mixtures of food: crunchiness, colour, flavour* *• Food hygiene* *• Energy value of biscuits* *Group organisation into production line* *• Accurate measuring and timing* *• Combining ingredients by mixing with hands/fork* *• Use of cutters for accurate shaping* *What are Cornish Fairings?* *• Work out production costs for a batch and a single biscuit (spreadsheet?)* *• Discuss making products to sell for charity*

Subject content

Key stage 1 Pupils should be taught to:

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

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.

Cooking and Nutrition

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

Key stage 2 Pupils should be taught to:

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

- ♣ ♣ 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.