Design & Technology Scheme of Work/Progression – Class 1

Research	Designing	Making	Evaluating
• Taking apart mechanisms, e.g toys • Use of internet and reference books • Collect photos/diagrams • Looking at Samples	• Use pictures and words to describe what they want to do • Explain what they are making • List tools and materials to be used from a limited range • Make plan based on previous experience • Use construction kits to make a mock-up	• Learn skills and methods • Use appropriate tools (from given range) • Make a mock-up (model of product from any material-no function) • Make products with support as required • Finish products-paint, decorate, add details	• Explain how a product works • Recognise what has been done well • Suggest improvements for future • Compare to original design • Show an awareness of the need for modification of original ideas

Early Years Foundation Stage

D&T forms part of the learning children acquire under the 'Knowledge and Understanding of the World' and the 'Expressive Arts and Design' section of the Foundation Stage Curriculum. Based on the curriculum guidance for the Foundation Stage, the typical D&T learning experiences children will be encourages to do in the EYFS are:

• Learn how to use simple tools such as scissors/ hammers • Use a range of techniques such as sticking & folding, to shape, assemble and join materials • Build with a wide range of objects, selecting appropriate resources and adapting their work where necessary	• Think about uses and purposes of materials • Have experiences of simple cooking techniques • Experiment with colour, design, texture, form and function	• Discuss reasons that make activities safe or unsafe, e.g.hygiene, electrical awareness, appropriate use of senses when tasting different flavourings • To record their experiences by drawing or making a model

Key Stage 1

Cooking & Nutrition	Structures	Textiles	Mechanisms
Health & Safety • Allergies/dietary requirements of pupils • Clean surfaces and equipment • Handling equipment safely • No jewellery/ nail varnish/ long hair tied back • Wash hands, wear aprons	Health & Safety • Safety with tools • Storing equipment safely • Metal 'M' rulers • Junk is clean for children to use • Correct use of tools/equipment • Careful classroom set-up-bench hooks/worktops • Suitable adult supervision	Health & Safety • Handle needles with care/use plastic needles • Storage of sharp objects, e.g. needles/pins • Use appropriate scissors, handle safely • Avoid trip hazards	Health & Safety • Safety with tools • Storing equipment safely • Metal 'M' rulers Correct use of tools/equipment • Careful classroom set-up-bench hooks/worktops • Suitable adult supervision
Understand the basic principles of a healthy and varied diet. Look at different Food Groups. **Where Food Comes From** • Plants (roots, stems, leaves, flowers, seeds, fruits) • Animals (pigs, cows, poultry, sheep, fish)	Build structures and explore how they can be made stronger, stiffer and more stable. **Building with Junk** Children make models using tubes, boxes, plastic cartons, scrap paper/card. **Building with Wood**	Select a range of materials to use in construction according to their characteristics. **Methods of Textile Making** **Weaving**-interlacing two distinct sets of yarns or threads at right angles to form a fabric or cloth.	Children should be taught to explore and use mechanisms (e.g. levers, sliders, wheels and axles) in their products. **Sliders** Children use sliders to make objects move through a slit on a piece of card by pushing/pulling.

• Animal products (eggs, milk, honey, butter, cream, yoghurt) **Cooking** Name, use and explain the function of a basic range of cooking equipment and develop a range of basic cooking skills to prepare dishes using the basic principles of a healthy diet. **Cooking Skills** Mix, spread, grate, juice, use cutters, spoon ingredients, mash, thread, roll out, sift, weigh.	With adult support, pupils use cm square wood, dowling and balsa wood to make structures. **Construction Kits** Use lego, clixi, mobile, stickle bricks to build mock-ups. **Making Skills** • Cutting-scissors/shears • Marking materials (m-shaped ruler) • Joining- PVA glue, masking tape, pegs, clips, treasury tags • Strengthening card (layering, using supports-lolly sticks) • Sawing-junior hacksaw, bench hook • Joining wood-glue • Hammering- pin hammer **Finishing and Decorating** Use paint, pens, fabric, decoupage, stickers, varnish to finish products to make an attractive exterior.	**Making Skills** • Drawing designs • Drawing around templates • Marking • Cutting • Sewing • Joining-fabric glue/PVA/stapling **Sewing Stitches** Running stitch and Whip Stitch. **Finishing and Decorating** • Fabric pens/crayons • Block printing-range of objects dipped into paint • Applique-glueing/sewing fabrics onto a base layer of fabric Adding beads/ sequins/ ribbons/ pipe cleaners/ fringes	**Levers** Children make a lever consisting of a rigid bar or rod pivoted at one point along its length to produce a movement. **Wheels and axles** Wheels are mounted onto axles which allows the wheel to roll. The axle is attached to the vehicle. Children should explore: -Fixed Axles -Fixed wheels -Mounting axles on models -Fixing wheels to axles

Design & Technology Scheme of Work/Progression – Class 2

Research	Designing	Making	Evaluating
• Taking apart mechanisms, e.g toys • Use of internet and reference books • Collect photos/diagrams • Looking at Samples	• Labelled drawings • Explain what they are making • Choose appropriate equipment, components and techniques • Use existing products to help with design • Understand usefulness of a prototype • Recognise that design must meet a need	• Learn skills and methods • Use appropriate tools (from given range) • Make a mock-up (model of product from any material-no function) • Make products with support as required • Finish products-paint, decorate, add details	• Explain how a product works • Recognise what has been done well • Recognise what isn't working and suggest a modification • Show where they would have changed the design for the better • Evaluate in relation to design criteria and user's needs

Key Stage 1 and Lower KS2

Cooking & Nutrition	Structures	Textiles	Mechanisms	Electronic Systems	IT Control & Monitoring
Health & Safety • Allergies/dietary requirements of pupils • Clean surfaces and equipment • Handling equipment safely • No jewellery/ nail varnish/ long hair tied back • Wash hands, wear aprons	Health & Safety • Safety with tools • Storing equipment safely • Low temp glue guns • Metal 'M' rulers • Junk is clean for children to use • Correct use of tools/equipment • Careful classroom set-up-bench hooks/worktops • Suitable adult supervision	Health & Safety • Handle needles with care/use plastic needles • Storage of sharp objects, e.g. needles/pins • Use appropriate scissors, handle safely • Use safety clothing (aprons/gloves) when dying • Avoid trip hazards	Health & Safety • Safety with tools • Storing equipment safely • Metal 'M' rulers • Correct use of tools/equipment • Careful classroom set-up-bench hooks/worktops Suitable adult supervision	Health & Safety • Electrical circuits should not be connected to the mains, only batteries • Use clips on connectors where possible, cover connections with electrical tape if not • Handle bulbs, motors carefully • Suitable batteries (CLEAPSS guidance) • Keep work space dry and water well away	Health & Safety • Store/handle equipment safely
Understand and apply the principles of a healthy and varied diet. Have a developing understanding of the 'Eatwell Plate'.	Build structures and explore how they can be made stronger, stiffer and more stable. **KS1** Apply their understanding of how to strengthen, stiffen and reinforce more complex structures. **KS2**	Select a range of materials to use in construction according to their characteristics (KS1) Choose fabrics according to their functional properties and aesthetic qualities (KS2).	Children should be taught to explore and use mechanisms (e.g. levers, sliders, wheels and axles) in their products. **KS1** Children should be taught to understand and use mechanical systems in their	Electronic systems are introduced at KS2 within the primary curriculum. Children should be taught to understand and use electronic systems in their products (e.g. series circuits incorporating switches, buzzers and motors).	IT Control and Monitoring should be introduced at KS2. Children should be taught to apply their understanding of computing to program, monitor and control their products.

Where Food Comes From (KS1) • Plants (roots, stems, leaves, flowers, seeds, fruits) • Animals (pigs, cows, poultry, sheep, fish) • Animal products (eggs, milk, honey, butter, cream, yoghurt) **Seasonality (KS2)** Benefits of using fruit & vegetables in season. Research fruit & Veg in season, create graphs, charts or calendars. Find seasonal recipes. **Farming (KS2)** • Arable • Pastoral • Mixed • Horticulture • Market Gardening **Cooking (KS1/2)** Name, use and explain the function of a basic range of cooking equipment and develop a range of basic cooking skills to prepare dishes (KS1) and cook a variety of predominantly savoury dishes applying the principles of a healthy diet (KS2). **Cooking Skills (KS1)** Mix, spread, grate, juice, use cutters, spoon ingredients, mash, thread, roll out, sift, weigh. **Cooking Skills (KS2)**	**Innovators and Key Events-KS2** Children should be taught about how key events and individuals in D&T have helped shape the world. **Key Events:** -1849-Reinforcing Concrete -1930's-The age of plastic -1950's-Carbon Fibre Created **Key Individuals:** -Abraham Darby (1678-1717) -Isambard Kingdom Brunel (1806-1859) -Renzo Piano (1937-) **Building with Junk/cardboard** Children make models using tubes, boxes, plastic cartons, scrap paper/card. **Building with Wood** With adult guidance, pupils use cm square wood, dowling and balsa wood to make structures/ wooden frames. **Construction Kits** Use lego, knex, construction kits to build mock-ups/proto-types. **Making Skills** • Cutting-scissors/shears • Measuring/Marking materials (m-shaped ruler) • Scoring cardboard (end of biro-no ink) • Joining- PVA glue, masking tape, pegs, clips, treasury tags	**Innovators and Key Events-KS2** Children in KS2 need to be taught about how key events and individuals in D&T have helped shape the world. **Key Events:** -The industrial Revolution -The start of waterproofing fabric -The start of electronic textiles **Key Individuals:** -Heribert Bauer -Joseph Shivers -George De Mestral **Methods of Textile Making** **Looms**- Children make own looms from card or a wooden frame. If making a circular weave, use an odd number of strings. **Making Skills** • Drawing designs • Drawing around templates • Marking • Cutting • Sewing • Joining-fabric glue/PVA/stapling **Sewing Stitches** Running stitch, Whip Stitch, Back Stitch **Finishing and Decorating** • Fabric pens/crayons • Fabric Dyes-commercial dyes, natural dyes e.g. onions, beetroot	products (e.g. gears, pulleys, cams, levers and linkages). **KS2** **Innovators and Key Events-KS2** Children should be taught about how key events and individuals in D&T have helped shape the world. **Key Events:** -3500 BC The wheel -300 BC Gears Invented -1650 Start of the study of hydraulics **Key Individuals:** -Archimedes (287-212 BC) -Al-Jazari (1136-1206) **Linkages** Children make a linkage by combining the mechanisms of levers and sliders. Linkages allow a motion to be directed elsewhere. Linkages rely on a series of connectors joined by moving and fixed pivots. **Wheels and axles** Wheels are mounted onto axles which allows the wheeal to roll. The axle is attached to the vehicle. Children should explore: -Fixed Axles -Fixed wheels -Mounting axles on models -Fixing wheels to axles **Pulleys** Make simple pulleys, e.g. cotton reels, dowel, pegs which are fastened to models.	**Innovators and Key Events-KS2** Children should be taught about how key events and individuals in D&T have helped shape the world. **Key Events:** -1799-The Battery -1962-The light emitting diode (LED) -1941 and 1954-The solar panel **Key Individuals:** -Michael Faraday (1791-1867) -Joseph Swan (1828-1914) -Sir Charles Parsons (1854-1931) **Electrical Components** At LKS2, the components the children should be familiar with are: -Bulb -Buzzer -Motor -Switch-Push or toggle -Cell/Battery -Connectors The children should join components to build a circuit appropriate to a particular purpose, e.g lighting up a building. Ideally, connectors with clips on the end would be suited at LKS2. Where possible, links to science should be made.	**Innovators and Key Events-KS2** Children should be taught about how key events and individuals in D&T have helped shape the world. **Key Events:** -The creation of the microchip -The internet -The mobile phone **Key Individuals:** -Charles Babbage -Ada Lovelace -Alan Turing -Bill Gates Where possible, CAD (computer aided design) could be used to design products. **Software and Hardware** -2Design and Make (2Simple) **KS1** -Google SketchUp Make (3D Modelling) **KS2** -Crumble board -Silhouette Studio -Tinker CAD -Google Earth integrated with Google SketchUp -Floor Robots-Beebots/ Probots/ Roamer -ipad film/audio/camera Other products available: -MAKEYMAKEY -CAD -WeDo Lego -RASPBERRY PI -3D Printing

Peel, measure, press, baking, mix, spread, chop, slice, crack an egg and whisk, snip, blend, brush, grate (firmer foods), use cutters, spoon ingredients, thread, decorate using icing.	• Strengthening card (layering, using supports- lolly sticks, corrugated card) • Making nets • Sawing-junior hacksaw, bench hook • Sanding • Joining wood-glue, nails, staples, jinks corners • Drilling- hand drill • Hammering- pin hammer • Building frames **Finishing and Decorating** Use paint, pens, fabric, decoupage, stickers, varnish to finish products to make an attractive exterior.	• Dye method-dye resist • Block printing-range of objects dipped into paint • Applique-glueing/sewing fabrics onto a base layer of fabric • Adding beads/ sequins/ buttons/ ribbons/ pipe cleaners/ fringes	Also, a single pulley spinning on an axle can be used for hoisting up flags or hauling up buckets. **Pneumatics** Use simple ways to push air from one container to another (syringe air through a tube into a balloon to make balloon inflate to make a part move- e.g monster's mouth opening)		

Design & Technology Scheme of Work/Progression – Class 3

Research	Designing	Making	Evaluating
• Market Research-Talk to potential users/consumers to discuss requirements • Records of interviews/surveys • Surveying available products • Collect photos/diagrams • Looking at Samples/building a portfolio	• Annotated diagrams and drawings • Cross-sectional and exploded diagrams • Use knowledge of existing products to help with design • Use correct technical vocabulary • Produce step-by-step plans • Think of several ideas and select most appropriate • Make a prototype first and use it to evaluate design • Use various sources of information and market research	• Learn skills and methods • Choose appropriate tools • Make a proto-type (properly working model, not always full size) • Make products with supervision • Finish products-paint, decorate, add details	• Evaluate different designs and select which one to use • Modify during manufacture and explain why • Critically evaluate appearance and function • Justify choice of materials and construction methods • Develop own criteria for evaluation

Lower/Upper KS2

Cooking & Nutrition	Structures	Textiles	Mechanisms	Electronic Systems	IT Control & Monitoring
Health & Safety • Allergies/dietry requirements of pupils • Clean surfaces and equipment • Handling equipment safely • No jewellery/ nail varnish/ long hair tied back • Wash hands, wear aprons	Health & Safety • Safety with tools • Storing equipment safely • Low temp glue guns • Metal 'M' rulers • Junk is clean for children to use • Correct use of tools/equipment • Careful classroom set-up-bench hooks/worktops • Suitable adult supervision	Health & Safety • Handle needles with care/use plastic needles • Storage of sharp objects, e.g. needles/pins • Use appropriate scissors, handle safely • Use safety clothing (aprons/gloves) when dying • Avoid trip hazards	Health & Safety • Safety with tools • Storing equipment safely • Metal 'M' rulers • Correct use of tools/equipment • Careful classroom set-up-bench hooks/worktops • Suitable adult supervision	Health & Safety • Electrical circuits should not be connected to the mains, only batteries • Use clips on connectors where possible, cover connections with electrical tape if not • Suitable batteries (CLEAPSS guidance) • Handle bulbs, motors carefully • Keep work space dry and water well away	Health & Safety • Store/handle equipment safely
Understand and apply the principles of a healthy and varied diet. Have a good understanding of the 'Eatwell Plate'.	Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.	Choose fabrics according to their functional properties and aesthetic qualities. **<u>Innovators and Key Events-KS2</u>**	Children should be taught to understand and use mechanical systems in their products (e.g. gears, pulleys, cams, levers and linkages).	Electronic systems are introduced at KS2 within the primary curriculum. Children should be taught to understand and use electronic systems in	IT Control and Monitoring should be introduced at KS2. Children should be taught to apply their understanding of

Seasonality Benefits of using fruit & vegetables in season. Research fruit & Veg in season, create graphs, charts or calendars. Find seasonal recipes. **Farming** • Arable • Pastoral • Mixed • Horticulture • Market Gardening **Cooking** Name, use and explain the function of a basic range of cooking equipment and develop a range of basic cooking skills to prepare dishes and cook a variety of predominantly savoury dishes applying the principles of a healthy diet. **Cooking Skills** Peel, measure, press, baking, mix, spread, chop, slice, crack an egg and whisk, snip, blend, brush, grate (firmer foods), use cutters, spoon ingredients, thread, decorate using icing.	**Innovators and Key Events** Pupils should be taught about how key events and individuals in D&T have helped shape the world. **Key Events:** 1849-Reinforcing Concrete 1930's-The age of plastic 1950's-Carbon Fibre Created **Key Individuals:** Abraham Darby (1678-1717) Isambard Kingdom Brunel (1806-1859) Renzo Piano (1937-) **Building with Junk/cardboard** Children make models using tubes, boxes, plastic cartons, scrap paper/card. **Building with Wood** With adult guidance, pupils use cm square wood, dowling and balsa wood to make structures/ wooden frames. **Construction Kits** Use lego, knex, construction kits to build proto-types. **Making Skills** • Cutting-scissors/shears/ craft knives (Y5/6 under strict supervision) • Measuring/Marking materials (m-shaped ruler) • Scoring cardboard (end of biro-no ink/craft knife (Y5/6 only-supervised)	Children in KS2 need to be taught about how key events and individuals in D&T have helped shape the world. **Key Events:** -The industrial Revolution -The start of waterproofing fabric -The start of electronic textiles **Key Individuals:** -Heribert Bauer -Joseph Shivers -George De Mestral **Methods of Textile Making** **Felting-**Shrinking or matting fibres together using moisture, heat and pressure to form a dense fabric. **Making Skills** • Drawing designs • Drawing around templates • Marking • Cutting • Sewing **Sewing Stitches** Running stitch, Whip stitch, Back stitch, Blanket Stitch, Chain stitch, Cross stitch **Finishing and Decorating** • Fabric Dyes-commercial dyes, natural dyes e.g. onions, beetroot • Dye method- tie dye • Block printing-range of objects dipped into paint	**Innovators and Key Events-KS2** Children should be taught about how key events and individuals in D&T have helped shape the world. **Key Events:** -3500 BC The wheel -300 BC Gears Invented -1650 Start of the study of hydraulics **Key Individuals:** -Archimedes (287-212 BC) -Al-Jazari (1136-1206) **Linkages** Children make a linkage by combining the mechanisms of levers and sliders. Linkages allow a motion to be directed elsewhere. Linkages rely on a series of connectors joined by moving and fixed pivots. **Gears (KS2)** Children should use gears to make things move. Children should explore: -Different sized gears -Changes in orientation of gears -how to mount gears -motorised gears **Pulleys** Children use more than one pulley, which are linked together with a belt. Children should explore: -Different pulley models	their products (e.g. series circuits incorporating switches, buzzers and motors). **Innovators and Key Events-KS2** Children should be taught about how key events and individuals in D&T have helped shape the world. **Key Events:** -1799-The Battery -1962-The light emitting diode (LED) -1941 and 1954-The solar panel **Key Individuals:** -Michael Faraday (1791-1867) -Joseph Swan (1828-1914) -Sir Charles Parsons (1854-1931) **Electrical Components** At UKS2, the components the children should be familiar with are: -Bulb -Buzzer -Motor -LED -Switch-Push/toggle -Cell/Battery -Connectors The children should join components to build a circuit appropriate to a particular purpose, e.g. motorising a vehicle, burglar alarms. Connectors with clips on the end could be used or children can twist lengths of the bare wires at the end of a connector	computing to program, monitor and control their products. **Innovators and Key Events-KS2** Children should be taught about how key events and individuals in D&T have helped shape the world. **Key Events:** -The creation of the microchip -The internet -The mobile phone **Key Individuals:** -Charles Babbage -Ada Lovelace -Alan Turing -Bill Gates Where possible, CAD (computer aided design) could be used to design products. **Software and Hardware** -2Design and Make (2Simple) **KS1** -Google SketchUp Make (3D Modelling) **KS2** -Crumble board -Silhouette Studio -Tinker CAD -Google Earth integrated with Google SketchUp -Floor Robots-Beebots/ Probots/ Roamer -ipad film/audio/camera Other products available: -MAKEYMAKEY -CAD -WeDo Lego

	• Joining- PVA glue, low temp glue gun, masking tape, pegs, clips, treasury tags • Strengthening card (layering, using supports- lolly sticks, corrugated card) • Making nets • Sawing-junior hacksaw, bench hook • Sanding • Joining wood-glue, nails, staples, jinks corners • Drilling- hand drill • Hammering- pin hammer • Building frames **<u>Finishing and Decorating</u>** Use paint, pens, fabric, decoupage, stickers, varnish to finish products to make an attractive exterior.	• Applique-sewing fabrics onto a base layer of fabric • Adding beads/ sequins/ buttons/ ribbons/ fringes etc	-Using a belt to connect pulleys -Different sized pulleys -Different quantities of pulleys **<u>Cams</u>** Children use cams to make a movement. Children should explore: -Different cams (eccentric, pear-shaped, snail cams) -How the shape of the cam affects the movement made -Ways of assembling cams	to the other components in the circuit. **Children should:** -Draw pictures of circuit diagrams using standard symbols for components. Where possible, links to science should be made.	-RASPBERRY PI -3D Printing