St Charles'

VC Academy

Design and Technology Long Term Plan and

Skills Progression

Based on 'Projects on a Page' by data.org

Design and Technology Progress

Designing	Key Stage 1	Key Stage 2
Understanding contexts, users and purposes	Across KS1 pupils should: • work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment • state what products they are designing and making • say whether their products are for themselves or other users • describe what their products are for • say how their products will work • say how they will make their products suitable for their intended users • use simple design criteria to help develop their ideas	Across KS2 pupils should: • work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment • describe the purpose of their products • indicate the design features of their products that will appeal to intended users • explain how particular parts of their products work In early KS2 pupils should also: • gather information about the needs and wants of particular individuals and groups • develop their own design criteria and use these to inform their ideas In late KS2 pupils should also: • carry out research, using surveys, interviews, questionnaires and web-based resources • identify the needs, wants, preferences and values of particular individuals and groups • *develop a simple design specification to guide their thinking*
Generating, developing, modelling and communicating ideas	Across KS1 pupils should: • generate ideas by drawing on their own experiences • use knowledge of existing products to help come up with ideas • develop and communicate ideas by talking and drawing • model ideas by exploring materials, components and • construction kits and by making templates and mockups • use information and communication technology, where appropriate, to develop and communicate their ideas	Across KS2 pupils should: • share and clarify ideas through discussion • model their ideas using prototypes and pattern pieces • use annotated sketches, cross-sectional drawings and exploded diagrams to develop and • communicate their ideas • use computer-aided design to develop and communicate their ideas In early KS2 pupils should also: • generate realistic ideas, focusing on the needs of the user • *make design decisions that take account of the availability of resources* In late KS2 pupils should also: • generate innovative ideas, drawing on research • *make design decisions, taking account of constraints such as time, resources and cost*
Making	**Key Stage 1**	**Key Stage 2**
Planning	Across KS1 pupils should: • *plan by suggesting what to do next* • select from a range of tools and equipment, *explaining their choices* • select from a range of materials and components according to their characteristics	Across KS2 pupils should: • select tools and equipment suitable for the task • *explain their choice of tools and equipment in relation to the skills and techniques they will be using* • select materials and components suitable for the task • explain their choice of materials and components according to functional properties and aesthetic qualities In early KS2 pupils should also: • *order the main stages of making* In late KS2 pupils should also: • *produce appropriate lists of tools, equipment and materials that they need* • *formulate step-by-step plans as a guide to making*
Practical skills and techniques	Across KS1 pupils should: • follow procedures for safety and hygiene • use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components • measure, mark out, cut and shape materials and components • assemble, join and combine materials and components • use finishing techniques, including those from art and design	Across KS2 pupils should: • follow procedures for safety and hygiene • use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components In early KS2 pupils should also: • measure, mark out, cut and shape materials and components with some accuracy • assemble, join and combine materials and components with some accuracy • apply a range of finishing techniques, including those from art and design, with some accuracy In late KS2 pupils should also: • accurately measure, mark out, cut and shape materials and components • accurately assemble, join and combine materials and components • accurately apply a range of finishing techniques, including those from art and design • *use techniques that involve a number of steps* • demonstrate resourcefulness when tackling practical problems

Evaluating	Key Stage 1	Key Stage 2
Own ideas and products	Across KS1 pupils should: • talk about their design ideas and what they are making • make simple judgements about their products and ideas against design criteria • *suggest how their products could be improved*	• Across KS2 pupils should: • identify the strengths and areas for development in their ideas and products • consider the views of others, including intended users, to improve their work In early KS2 pupils should also: • refer to their design criteria as they design and make • use their design criteria to evaluate their completed products In late KS2 pupils should also: • critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make • *evaluate their ideas and products against their original design specification*
Existing products	Across KS1 pupils should explore: • what products are • who products are for • what products are for • how products work • how products are used • where products might be used • what materials products are made from • what they like and dislike about products	Across KS2 pupils should investigate and analyse: • how well products have been designed • how well products have been made • why materials have been chosen • what methods of construction have been used • how well products work • how well products achieve their purposes • how well products meet user needs and wants In early KS2 pupils should also investigate and analyse: • who designed and made the products • where products were designed and made • when products were designed and made • whether products can be recycled or reused In late KS2 pupils should also investigate and analyse: • how much products cost to make • how innovative products are • how sustainable the materials in products are • what impact products have beyond their intended purpose
Key events and Individuals	Not a requirement in KS1	Across KS2 pupils should know: • about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products
Technical Knowledge	**Key Stage 1**	**Key Stage 2**
Making products work	Across KS1 pupils should know: • about the simple working characteristics of materials and components • about the movement of simple mechanisms such as levers, sliders, wheels and axles • how freestanding structures can be made stronger, stiffer and more stable • *that a 3-D textiles product can be assembled from two identical fabric shapes* • *that food ingredients should be combined according to their sensory characteristics* • *the correct technical vocabulary for the projects they are undertaking*	Across KS2 pupils should know: • how to use learning from science to help design and make products that work • how to use learning from mathematics to help design and make products that work • that materials have both functional properties and aesthetic qualities • *that materials can be combined and mixed to create more useful characteristics* • that mechanical and electrical systems have an input, process and output • *the correct technical vocabulary for the projects they are undertaking* In early KS2 pupils should also know: • how mechanical systems such as levers and linkages or pneumatic systems create movement • how simple electrical circuits and components can be used to create functional products • how to program a computer to control their products • how to make strong, stiff shell structures • *that a single fabric shape can be used to make a 3D textiles product* • *that food ingredients can be fresh, pre-cooked and processed* In late KS2 pupils should also know: • how mechanical systems such as cams or pulleys or gears create movement • how more complex electrical circuits and components can be used to create functional products • how to program a computer to monitor changes in the environment and control their products • how to reinforce and strengthen a 3D framework • *that a 3D textiles product can be made from a combination of fabric shapes* • *that a recipe can be adapted by adding or substituting one or more ingredients*

Cooking and Nutrition	Key Stage 1	Key Stage 2
Where food comes from	Across KS1 pupils should know: • that all food comes from plants or animals • that food has to be farmed, grown elsewhere (e.g. home) or caught	Across KS2 pupils should know: • that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world In late KS2 pupils should also know: • that seasons may affect the food available • how food is processed into ingredients that can be eaten or used in cooking
Food preparation, cooking and nutrition	Across KS1 pupils should know: • how to name and sort foods into the five groups in The eatwell plate • that everyone should eat at least five portions of fruit and vegetables every day • how to prepare simple dishes safely and hygienically, without using a heat source • how to use techniques such as cutting, peeling and grating	Across KS2 pupils should know: • how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source • how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking In early KS2 pupils should also know: • that a healthy diet is made up from a variety and balance of different food and drink, as depicted in The eatwell plate • that to be active and healthy, food and drink are needed to provide energy for the body In late KS2 pupils should also know: • *that recipes can be adapted to change the appearance, taste, texture and aroma* • that different food and drink contain different substances – nutrients, water and fibre – that are needed for health

Whole School Overview

Year Group	Autumn	Spring	Summer
Year 1	**Textiles** Templates & Joining	**Mechanisms** Wheels and Axels	**Cooking and Nutrition** Preparing fruit and vegetables
Year 2	**Mechanism** Sliders and Levers	**Structures** Freestanding Structures	**Cooking and Nutrition** Preparing fruit and vegetables
Year 3	**Structures** Shell Structures	**Cooking and Nutrition** Healthy and varied diet	**Mechanical Systems** Levers and Linkages
Year 4	**Textiles** 2D shapes to 3D products	**Electrical Systems** Simple Circuits & Switches	**Cooking and Nutrition** Healthy and varied diet
Year 5	**Textiles** Combining different fabric shapes	**Mechanical systems** Pulleys or Gears	**Cooking and Nutrition** Celebrating culture and seasonality
Year 6	**Electrical Systems** More Complex switches	**Cooking and Nutrition Celebrating** Culture and Seasonality	**Structures** Frame structures

Year 1

TEXTILES	**Templates and joining techniques** (*See 'D & T Projects on a Page' 1-2*) *E.G. glove puppets, finger puppet, simple bag, clothes for a teddy/doll, fabric placemat.*		
Links with other subjects	**Science:** Everyday materials	**Maths:** Measures - cm	**Other:**

Designing	Making	Evaluating	Technical Knowledge
• Design a functional and appealing product for a chosen user and purpose based on simple design criteria. • Generate, develop, model and communicate their ideas as appropriate through talking, drawing, templates, mock-ups and information and communication technology.	• Select from and use a range of tools and equipment to perform practical tasks such as marking out, cutting, joining and finishing. • Select from and use textiles according to their characteristics.	• 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.	• Understand how simple 3-D textile products are made, using a template to create two identical shapes. • Understand how to join fabrics using different techniques e.g. running stitch, glue, over stitch, stapling. • Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons. • Know and use technical vocabulary relevant to the project.

Alternative ideas and /or information sources:

MECHANISMS	**Wheels and Axels** (*See 'D & T Projects on a Page' 1-2*) *E.g. push/pull toys e.g. emergency service vehicles, carinal floats, farm vehicles, cars. Vehicles for characters in stories, shopping trolley.*		
Links with other subjects	**Science:** Forces – push/pull	**Maths:** measures: standard and non standard units	**Other:**

Designing	Making	Evaluating	Technical Knowledge
• Generate initial ideas and simple design criteria through talking and using own experiences. • Develop and communicate ideas through drawings and mock-ups.	• Select from and use a range of tools and equipment to perform practical tasks such as cutting and joining to allow movement and finishing. • Select from and use a range of materials and components such as paper, card, plastic and wood according to their characteristics.	• Explore and evaluate a range of products with wheels and axles. • Evaluate their ideas throughout and their products against original criteria.	• Explore and use wheels, axles and axle holders. • Distinguish between fixed and freely moving axles. • Know and use technical vocabulary relevant to the project.

Alternative ideas and /or information sources:
Nuffield Project Pack: 'How will your roly Poly move?'

COOKING AND NUTRITION	**Preparing Fruit and vegetables** (*See 'D & T Projects on a Page' 1-2*) *E.g. fruit salad; vegetable salads; mixed, layered salad; fruit and vegetable kebabs; fruit smoothie; dips; cous cous*		
Links with other subjects	**Science:** Human digestive system and healthy teeth	**Maths:** Mass kg/g	**Other:**

Designing	Making	Evaluating	Technical Knowledge
• Generate and clarify ideas through discussion with peers and adults 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.	• Plan the main stages of a recipe, listing ingredients, utensils and equipment. • Select and use appropriate utensils and equipment to prepare and combine ingredients. *(peel, cut, slice, squeeze, grate and chop safely)* • Select from a range of fruit and vegetables to make appropriate food products, thinking about sensory characteristics.	• Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs. • Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.	• Know about healthy eating and varied diet and understand how fruit and vegetables are part of *The Eatwell Plate.* • Know how to use appropriate equipment and utensils to prepare and combine food. • Know about a range of fruit and vegetables appropriate for their product, and where they come from. • Know and use relevant technical and sensory vocabulary appropriately.

Alternative ideas and /or information sources:
Nuffield Project Pack: '*How Cool is Your drink?* (A healthy cold drink)

Year 2

MECHANISMS	**Sliders and Levers** (*See 'D & T Projects on a Page' 1-2*) *E.G. story book with moving images, greetings card, poster/display with moving parts, picture with moving parts.*		
Links with other subjects	**Science:** Forces – pull/push	**Maths:** language of position and direction – left, right, up, down	**Other:**

Designing	Making	Evaluating	Technical Knowledge
• Generate ideas based on simple design criteria and their own experiences, explaining what they could make. • Develop, model and communicate their ideas through drawings and mock-ups with card and paper.	• Plan by suggesting what to do next. • Select and use tools, explaining their choices, to cut, shape and join paper and card. • Use simple finishing techniques suitable for the product they are creating.	• 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 the user and whether it meets design criteria.	• Explore and use sliders and levers. • Understand that different mechanisms produce different types of movement. • Know and use technical vocabulary relevant to the project.

Alternative ideas and /or information sources:
Nuffield Project Pack: 'Which part of your picture should move?'

STRUCTURES	**Freestanding structures** (*See 'D & T Projects on a Page' 1-2*) *E.g. Enclosures o farm or zoo animals, furniture for dolls hoOuse/bear/doll, playground/park/garden furniture for toys*		
Links with other subjects	**Science:** Properties of materials	**Maths:** Shape – 2d/3d shapes	**Other:** Geography - feildwork

Designing	Making	Evaluating	Technical Knowledge
• Generate ideas based on simple design criteria and their own experiences, explaining what they could make. • Develop, model and communicate their ideas through talking, mock-ups and drawings.	• Plan by suggesting what to do next. • 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.	• 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 purpose, the user and whether it meets the original design criteria.	• Know how to make freestanding structures stronger, stiffer and more stable. • Know and use technical vocabulary relevant to the project.

Alternative ideas and /or information sources:

COOKING AND NUTRITION	**Preparing Fruit and vegetables** (*See 'D & T Projects on a Page' 1-2*) *E.g. fruit salad; vegetable salads; mixed, layered salad; fruit and vegetable kebabs; fruit smoothie; dips; cous cous*		
Links with other subjects	**Science:** Human digestive system and healthy teeth	**Maths:** Mass kg/g	**Other:**

Designing	Making	Evaluating	Technical Knowledge
• Generate and clarify ideas through discussion with peers and adults 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.	• Plan the main stages of a recipe, listing ingredients, utensils and equipment. • Select and use appropriate utensils and equipment to prepare and combine ingredients. *(peel, cut, slice, squeeze, grate and chop safely)* • Select from a range of fruit and vegetables to make appropriate food products, thinking about sensory characteristics.	• Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs. • Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.	• Know about healthy eating and varied diet and understand how fruit and vegetables are part of ***The Eatwell Plate.*** • Know how to use appropriate equipment and utensils to prepare and combine food. • Know about a range of fruit and vegetables appropriate for their product, and where they come from. • Know and use relevant technical and sensory vocabulary appropriately.

Alternative ideas and /or information sources:
Nuffield Project Pack: '*How Cool is Your drink?* (A healthy cold drink)

Year 3

STRUCTURES	**Shell Structures** (*See 'D & T Projects on a Page' 3-4*) *E.g. gift boxes/containers; desk tidy; disposable/recyclable lunchboxes; packaging; cool boxes; party boxes; keep safe boxes; mystery boxes*		
Links with other subjects	**Science:** Properties of materials	**Maths:** 2-D and 3-D shapes and nets	**Other:**

Designing	Making	Evaluating	Technical Knowledge
• 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 and use annotated sketches and prototypes to model and communicate ideas.	• 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.	• Investigate and evaluate a range of existing shell structures including the materials, components and techniques that have been used. • Test and evaluate their own products against design criteria and the intended user and purpose.	• Develop and use knowledge of how to construct strong, stiff shell structures. • Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes. • Know and use technical vocabulary relevant to the project.

Alternative ideas and /or information sources:
Nuffield Project Pack: '*How Will You Store Your favourite Things?*' (Develop a 3-D form from a 2-D net)

COOKING AND NUTRITION	**Healthy and varied Diet** (*See 'D & T Projects on a Page' 3-4*) E.g. *sandwiches; wraps; rolls; pitta pockets; toasties; rice cakes;*		
Links with other subjects	**Science:** Animals including humans	**Maths:** Mass kg/g	**Other:**

Designing	Making	Evaluating	Technical Knowledge
• Generate and clarify ideas through discussion with peers and adults 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.	• 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.	• Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs. • Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.	• Know about healthy eating and understand what is meant by ***The Eatwell Plate.*** • Know how to use appropriate equipment and utensils to prepare and combine food. • Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught. • Know and use relevant technical and sensory vocabulary appropriately.

Alternative ideas and /or information sources:

MECHANICAL SYSTEMS	**Levers and Linkages** (*See 'D & T Projects on a Page' 3-4*) *E.g. story book; poster; class display; greetings card; information book; storyboard*		
Links with other subjects	**Science:**	**Maths:** vocabulary of position, direction and movement. Measurement in m/mm.	**Other:**

Designing	Making	Evaluating	Technical Knowledge
• Generate realistic ideas and their own design criteria through discussion, focusing on the needs of the user. • Use annotated sketches and prototypes to develop, model and communicate ideas.	• Explore and use mechanisms such as flaps, sliders and levers. • 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.	• 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.	• Understand and use lever and linkage mechanisms. • Distinguish between fixed and loose pivots. • Know and use technical vocabulary relevant to the project.

Alternative ideas and /or information sources:
Nuffield Project Pack: '*Will this story surprise you?*' (Pop-up book mechanisms)

Year 4

TEXTILES	**2-D Shape to 3-D Product** (*See 'D & T Projects on a Page' 3-4*) *E.g. purse/wallet; soft toy/mascot; apron; fashion accessory; beach bag; shoe bag; pencil case; story sack*		
Links with other subjects	**Science:** Properties of fabrics	**Maths:** 2-D and 3-D shape and nets; measurement cm/mm	**Other: Art (Textiles)-** investigating visual and tactile qualities of fabrics and using colour and pattern appropriately.

Designing	Making	Evaluating	Technical Knowledge
• Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s. • Produce annotated sketches, prototypes, final product sketches and pattern pieces.	• 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.	• 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. • Take into account others' views. • Understand how a key event/individual has influenced the development of the chosen product and/or fabric.	• Know how to strengthen, stiffen and reinforce existing fabrics. • Understand how to securely join two pieces of fabric together. • Understand the need for patterns and seam allowances. • Know and use technical vocabulary relevant to the project.

Alternative ideas and /or information sources:

ELECTRICAL SYSTEMS	**Simple Circuits and Switches** (*See 'D & T Projects on a Page' 3-4*) *E.g. siren for a toy vehicle; reading light; noise-making toy; nightlight; illuminated sign; torches; table lamp; lighting for display; hands-free head lamp; buzzer for school office*		
Links with other subjects	**Science:** construct simple series circuits; conductors, insulators and switches	**Maths:**	**Other: Computing** – control programs

Designing	Making	Evaluating	Technical Knowledge
• Gather information about needs and wants, and develop design criteria to inform the design of products that are fit for purpose, aimed at particular individuals or groups. • Generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches, cross-sectional and exploded diagrams.	• Order the main stages of making. • Select from and use tools and equipment to cut, shape, join and finish with some accuracy. • Select from and use materials and components, including construction materials and electrical components according to their functional properties and aesthetic qualities.	• Investigate and analyse a range of existing battery-powered products. • Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work.	• Know how to construct a simple series electrical circuit in science, using bulbs, switches and buzzers. • Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers. • Apply their understanding of computing to program and control their products. • Know and use technical vocabulary relevant to the project.

Alternative ideas and /or information sources:

COOKING AND NUTRITION	**Healthy and varied Diet** (*See 'D & T Projects on a Page' 3-4*) E.g. *sandwiches; wraps; rolls; pitta pockets; toasties; rice cakes;*		
Links with other subjects	**Science:** Human digestive system and healthy teeth	**Maths:** Mass kg/g	**Other:**

Designing	Making	Evaluating	Technical Knowledge
• Generate and clarify ideas through discussion with peers and adults 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.	• 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.	• Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs. • Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.	• Know about healthy eating and understand what is meant by ***The Eatwell Plate.*** • Know how to use appropriate equipment and utensils to prepare and combine food. • Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught. • Know and use relevant technical and sensory vocabulary appropriately.

Alternative ideas and /or information sources:

Year 5

TEXTILES	**Combining Different Fabric Shapes** (*See 'D & T Projects on a Page' 5-6*) *E.g tablet case; mobile phone carrier; shopping bag; insulating bag; hat/cap; garden tool belt; slippers; sandals; fabric advent calendar; fabric door stop*		
Links with other subjects	**Science:** Properties of fabrics.	**Maths:** 2-D nets to 3-D shapes; accurate measuring.	**Other: History-** people in the locality linked to textiles and products ; **Art** –methods of adding colour, pattern and texture on to textiles; weaving or felt making.

Designing	Making	Evaluating	Technical Knowledge
• Generate innovative ideas by carrying out research including surveys, interviews and questionnaires. • Develop, model and communicate ideas through talking, drawing, templates, mock-ups and prototypes and, where appropriate, computer aided design. • Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification.	• 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.	• 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 the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work.	• A 3-D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics. • Fabrics can be strengthened, stiffened and reinforced where appropriate.

Alternative ideas and /or information sources:

MECHANICAL SYSTEMS	**Pulleys or Gears** (*See 'D & T Projects on a Page' 5-6* ***E.g.*** *fairground ride with gears or pulleys (carousel, Ferris wheel)* *controllable toy vehicle with gears or pulleys (dragster, off-road vehicle, sports car, lorry)* *window display with moving parts (lifting or turning items for sale)*		
Links with other subjects	**Science:** circuits, switches, conductors and insulators; Forces	**Maths:** understand ratios; Accurate measuring in cm /mm.	**Other:**

Designing	Making	Evaluating	Technical Knowledge
• Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide thinking. • Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views.	• 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.	• Compare the final product to the original design specification. • Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work. • Investigate famous manufacturing and engineering companies relevant to the project.	• Understand that mechanical and electrical systems have an input, process and an output. • Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement. • Know and use technical vocabulary relevant to the project.

Alternative ideas and /or information sources:
Nuffield Project Pack: '*How Fast Should Your Buggy Be?* (A controllable, battery powered vehicle)

COOKING AND NUTRITION	**Celebrating Culture and Seasonality- Hot meal** (*See 'D & T Projects on a Page' 5-6*) *E.g. vegetable soup; curry; vegetable kebabs; samosas; fish cakes*		
Links with other subjects	**Science:** Changes of state; Impact of diet on the way our bodies function.	**Maths:** measuring mass kg/g;	**Other: Geography** – distribution of natural resources i.e. food.

Designing	Making	Evaluating	Technical Knowledge
• Generate innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification. • Explore a range of ideas, and make design decisions to develop a final product linked to user and purpose. • Use words, annotated sketches and ICT as appropriate to develop and communicate ideas.	• Write a step-by-step recipe, including a list of ingredients, equipment and utensils • Select and use utensils and equipment accurately to measure and combine appropriate ingredients. • Make, decorate and present the food product appropriately for the intended user and purpose.	• 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 and design specification, taking into account the views of others when identifying improvements. • Understand how key chefs have influenced eating	• Know and understand about food hygiene, nutrition, healthy eating and a varied diet. *Understand what is meant by* ***The Eatwell Plate.*** • Know how to use utensils and equipment including heat sources to prepare and cook food. • Understand about seasonality in relation to food products and the source of different food products. • Know and use relevant technical and sensory vocabulary.

Alternative ideas and /or information sources:

Year 6

ELECTRICAL SYSTEMS	**More Complex Switches and Circuits** (*See 'D & T Projects on a Page' 5-6*) ***Choose from:*** *vehicle alarm; security lighting system; alarm for valuable artefact; automatic nightlight; electrical board game; alarm for school shed*		
Links with other subjects	**Science:** circuits, switches, conductors and insulators.	**Maths:** accurate measuring - cm /mm.	**Other: Computing** – control programs

Designing	Making	Evaluating	Technical Knowledge
• Use research to develop a design specification for a functional product that responds automatically to changes in the environment. Take account of constraints e.g. time, resources and cost. • Generate and develop innovative ideas and share and clarify these through discussion. • Communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams.	• Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components. • Competently 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 an electrical product to work automatically in response to changes in the environment.	• 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. • Investigate famous inventors who developed ground-breaking electrical systems and components.	• Understand and use electrical systems in their products. • Apply their understanding of computing to program, monitor and control their products. • Know and use technical vocabulary relevant to the project.

Alternative ideas and /or information sources:

Nuffield Project Pack: '*What sort of light will work for you?*' (A battery powered light with a switch)

COOKING AND NUTRITION	**Celebrating Culture and Seasonality - Baking** (*See 'D & T Projects on a Page' 5-6*) ***Choose from:*** *different types of bread; pizza; savoury biscuits; savoury scones; cheese straws*		
Links with other subjects	**Science:** Changes of state; Impact of diet on the way our bodies function.	**Maths:** measuring mass kg/g;	**Other: Geography** – distribution of natural resources i.e. food.

Designing	Making	Evaluating	Technical Knowledge
• Generate innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification. • Explore a range of initial ideas, and make design decisions to develop a final product linked to user and purpose. • Use words, annotated sketches and ICT as appropriate to develop and communicate ideas.	• 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.	• Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations E.g. use *tables/graphs/charts such as star diagrams.* • Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements. • Understand how key chefs have influenced eating	• Know and understand about food hygiene, nutrition, healthy eating and a varied diet. *Understand* ***The Eatwell Plate.*** • Know how to use utensils and equipment including heat sources to prepare and cook food. • Understand about seasonality in relation to food products and the source of different food products. • Know and use relevant technical and sensory vocabulary.

Alternative ideas and /or information sources:

STRUCTURES	**Frame Structures** (*See 'D & T Projects on a Page' 5-6*) *E.g. playground shelter; market stall; bus shelter; tent; play house; gazebo; bird hide; parasol; park furniture; adventure playground equipment; kite*		
Links with other subjects	**Science:** Properties of materials	**Maths:** recognise, describe and build simple 3-D shapes. Measuring in cm/mm.	**Other:**

Designing	Making	Evaluating	Technical Knowledge
• Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost. • Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches.	• Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used. • Competently 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 they are designing and making.	• Investigate and evaluate a range of existing frame structures. • Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests. • Research key events and individuals relevant to frame structures.	• Have a basic understanding of what structures are and how they can be made stronger, stiffer and more stable. • Understand how to strengthen, stiffen and reinforce 3-D frameworks. • Know and use technical vocabulary relevant to the project.

Alternative ideas and /or information sources: