

Design Technology Skill Progression

Design and Technology Projects for Year 3



AUTUMN : STRUCTURES	Shell Structures <i>E.g. gift boxes/containers; desk tidy; disposable/recyclable lunchboxes; packaging; cool boxes; party boxes; keep safe boxes; mystery boxes</i>		
Possible links with other subjects	Science: Properties of materials	Maths: 2-D and 3-D shapes and nets	History: Investigate, design and make Iron Age dwellings.
Designing	Making	Evaluating	Technical Knowledge
<ul style="list-style-type: none"> Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and purpose of the product. Develop ideas through the analysis of existing products and use annotated sketches and prototypes to model and communicate ideas. 	<ul style="list-style-type: none"> Order the main stages of making. Select and use appropriate tools to measure, mark out, cut, score, shape and assemble with some accuracy. Explain their choice of materials according to functional properties and aesthetic qualities. Use finishing techniques suitable for the product they are creating. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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.

SPRING FOOD	Preparing Fruit and vegetables <i>E.g. fruit salad; vegetable salads; mixed, layered salad; fruit and vegetable kebabs; fruit smoothie; dips; cous cous</i>		
Possible links with other subjects	Science: Human digestive system and healthy teeth	Maths: Mass kg/g	Geography: Why is Birmingham the best city in the world? What foods are imported to Birmingham? What is a typical Brummie meal?
Designing	Making	Evaluating	Technical Knowledge
<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Plan the main stages of a recipe, listing ingredients, utensils and equipment. Select and use appropriate utensils and equipment to prepare and combine ingredients. (<i>peel, cut, slice, squeeze, grate and chop safely</i>) Select from a range of fruit and vegetables to make appropriate food products, thinking about sensory characteristics. 	<ul style="list-style-type: none"> Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs. Evaluate the ongoing work and the final product with reference to the design criteria and the views of others. 	<ul style="list-style-type: none"> 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.

SUMMER TEXTILES	2-D Shape to 3-D Product <i>E.g. purse/wallet; soft toy/mascot; apron; fashion accessory; beach bag; shoe bag; pencil case; story sack</i>		
Possible links with other subjects	Science: Make a fashion accessory for Cleopatra.	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
<ul style="list-style-type: none"> Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s. Produce annotated sketches, prototypes, final product sketches and pattern pieces. 	<ul style="list-style-type: none"> Plan the main stages of making. Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing. Select fabrics and fastenings according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern. 	<ul style="list-style-type: none"> Investigate a range of 3-D textile products relevant to the project. Test their product against the original design criteria and with the intended user. Take into account others' views. Understand how a key event/individual has influenced the development of the chosen product and/or fabric. 	<ul style="list-style-type: none"> 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.

Design and Technology Projects for Year 4



AUTUMN: MECHANICAL SYSTEMS	Levers and Linkages <i>E.g. story book; poster; class display; greetings card; information book; storyboard</i>		
Possible links with other subjects	RE: Journeys	Maths: vocabulary of position, direction and movement. Measurement in m/mm.	History: What does Britain owe to the Ancient Greeks?
Designing	Making	Evaluating	Technical Knowledge
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Investigate and analyse books and, where available, other products with lever and linkage mechanisms. • Evaluate their own products and ideas against criteria and user needs, as they design and make. 	<ul style="list-style-type: none"> • Understand and use lever and linkage mechanisms. • Distinguish between fixed and loose pivots. • Know and use technical vocabulary relevant to the project.

SPRING: FOOD	Healthy and varied Diet <i>E.g. sandwiches; wraps; rolls; pitta pockets; toasties; rice cakes;</i>		
Links with other subjects	Science: Human digestive system and healthy teeth	Maths: Mass kg/g	History: Investigate foods we import from TRF areas and what we eat that grows in forested areas in the UK.
Designing	Making	Evaluating	Technical Knowledge
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Plan the main stages of a recipe, listing ingredients, utensils and equipment. • Select and use appropriate utensils and equipment to prepare and combine ingredients. • Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics. 	<ul style="list-style-type: none"> • Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs. • Evaluate the ongoing work and the final product with reference to the design criteria and the views of others. 	<ul style="list-style-type: none"> • 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.

SUMMER: ELECTRICAL SYSTEMS	Simple Circuits and Switches <i>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</i>		
Possible links with other subjects:	Science: construct simple series circuits; conductors, insulators and switches	RE: Spirituality through Art: Let there be light and dark.	Computing – control programs
Designing	Making	Evaluating	Technical Knowledge
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Order the main stages of making. • Select from and use tools and equipment to cut, shape, join and finish with some accuracy. • Select from and use materials and components, including construction materials and electrical components according to their functional properties and aesthetic qualities. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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.

Design and Technology Projects for Year 5



AUTUMN: FOOD	Celebrating Culture and Seasonality- Hot meal <i>E.g. vegetable soup; curry; vegetable kebabs; samosas; fish cakes</i>		
Possible links with other subjects	RE: Initiation Practices: Food at rites of passage ceremonies	Maths: measuring mass kg/g;	History: The Mayans- What did they eat? What foods do we import from The Americas today?
Designing	Making	Evaluating	Technical Knowledge
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations using e.g. tables/graphs/charts such as star diagrams. • Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements. • Understand how key chefs have influenced eating 	<ul style="list-style-type: none"> • Know and understand about food hygiene, nutrition, healthy eating and a varied diet. <i>Understand what is meant by The Eatwell Plate.</i> • 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.

SPRING: STRUCTURES	Frame Structures <i>E.g. playground shelter; market stall; bus shelter; tent; play house; gazebo; bird hide; parasol; park furniture; adventure playground equipment; kite</i>		
Possible links with other subjects	Science: Properties of materials	Maths: recognise, describe and build simple 3-D shapes. Measuring in cm/mm.	Geography: Active Planet... Why do people live near volcanoes and earthquakes? Investigate what structures would make the most stable/strong.
Designing	Making	Evaluating	Technical Knowledge
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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.

SUMMER: MECHANICAL SYSTEMS	Pulleys or Gears <i>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)</i>		
Possible links with other subjects	Science: Forces	Maths: understand ratios; Accurate measuring in cm /mm.	History: Investigate and make a viking Longboat. How birmingham is linked to the inventor of the Steam engine: James Watt and engineer Matthew Boulton.
Designing	Making	Evaluating	Technical Knowledge
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished. Work within the constraints of time, resources and cost. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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.

Design and Technology Projects for Year 6



AUTUMN: TEXTILES		Combining Different Fabric Shapes E.g tablet case; mobile phone carrier; shopping bag; insulating bag; hat/cap; garden tool belt; slippers; sandals; fabric advent calendar; fabric door stop		
Possible links with other subjects	History: For Queen and Country: How was Victoria's reign different to our present queen? How Birmingham is linked to textiles.	Maths: 2-D nets to 3-D shapes; accurate measuring.	Art –methods of adding colour, pattern and texture on to textiles; weaving or felt making.	
Designing		Making	Evaluating	Technical Knowledge
<ul style="list-style-type: none"> • 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. 		<ul style="list-style-type: none"> • Produce detailed lists of equipment and fabrics relevant to their tasks. • Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • Select from and use a range of tools and equipment to make products that are accurately assembled and well finished. Work within the constraints of time, resources and cost. 	<ul style="list-style-type: none"> • Investigate and analyse textile products linked to their final product. • Compare the final product to the original design specification. • Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work. 	<ul style="list-style-type: none"> • 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.

SPRING: FOOD		Celebrating Culture and Seasonality - Choose from: different types of bread; pizza; savoury biscuits; savoury scones; cheese straws		
Possible links with other subjects	Science: Changes of state; Impact of diet on the way our bodies function.	Maths: measuring mass kg/g;	Other: Geography – Blue Planet. Can we learn lessons from nature?UK/Africa)distribution of natural resources i.e. food.	
Designing		Making	Evaluating	Technical Knowledge
<ul style="list-style-type: none"> • 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. 		<ul style="list-style-type: none"> • Write a step-by-step recipe, including a list of ingredients, equipment and utensils • Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients. • Make, decorate and present the food product appropriately for the intended user and purpose. 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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.

SUMMER: ELECTRICAL SYSTEMS		More Complex Switches and Circuits Choose from: vehicle alarm; security lighting system; alarm for valuable artefact; automatic nightlight; electrical board game; alarm for school shed		
Possible links with other subjects	Science: circuits, switches, conductors and insulators.	Maths: accurate measuring - cm /mm.	Other: Computing – control programs	
Designing		Making	Evaluating	Technical Knowledge
<ul style="list-style-type: none"> • 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. 		<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Continually evaluate and modify the working features of the product to match the initial design specification. • Test the system to demonstrate its effectiveness for the intended user and purpose. • Investigate famous inventors who developed ground-breaking electrical systems and components. 	<ul style="list-style-type: none"> • 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.