



Design and Technology

At Keyworth Primary School, creativity, individuality and innovation are central to our ethos and are reflected in the creative curriculum we follow. Through design and technology, our children are taught to use their imaginations, to follow a brief and conduct research, to experiment, create and evaluate. We encourage the children to draw inspiration from a variety of areas, from historical research to past designs and designers, to consider their brief and reflect upon their own ideas and designs. The children are taught progressively, with skills revisited, refined and developed. As they move up the school, our children learn to deepen their learning, to think critically and develop their skills in problem solving, utilising and drawing upon skills in other areas, such as computing, science and maths.

Reception (Art, Design and DT)

Birth to Five Matters and ELG	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<p>Uses their increasing knowledge and understanding of tools and materials to explore their interests and enquiries and develop their thinking</p> <p><i>Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</i></p>	<p>Colour mixing experimentation</p> <p>Naming colours</p> <p>Using playdough tools</p>	<p>Creating stick puppets for retelling stories</p> <p>Making and using salt dough</p> <p>Developing simple patterns using stamps</p>	<p>Naming the primary colours</p> <p>Mixing primary colours</p> <p>Creating collages</p>	<p>Using clay to mould and manipulate</p>	<p>Observational drawings of natural environment</p> <p>2simple paint</p>	<p>Paper mâché to make planets</p> <p>Decorate pieces of fabric</p>
	<p>Drawing/ Painting on different surfaces. Chooses particular colours for imaginative purposes. Explores using different size brushes, rollers, sponges, twigs, fingers hand etc. Use junk modelling and construction resources to create connecting structures</p>					
<p>Use simple tools to effect changes to materials</p> <p><i>Handles tools objects, construction and malleable materials with increasing</i></p>	<p>Model using scissors safely</p> <p>Model bracing, using different tapes and glues</p>	<p>Model using treasury tags</p>	<p>Using stencils to create an under the sea picture</p> <p>Model using different types of folds</p>	<p>Model using spilt pins</p>	<p>Model using elastic bands and strings to connect</p>	<p>Model using a flange/slot to connect materials</p>

control and attention. shows a preference for dominant hand	Throughout children will have modelled and be allowed to explore the use of different tools safely and experience creating different objects and constructions.					
Develops their own ideas through experimentation with diverse materials, e.g. light, projected image, loose parts, watercolours, powder paint, to express and communicate their discoveries and understanding. Make use of props and materials when role playing characters and stories	Experiments with using fingers and hands to paint Leaf, coin and brick rubbings	Model using stick puppets to retell stories	Weaving with paper and ribbons	Children to explore using loose parts to create their own small world set ups	Painting with twigs and natural resources	Exploring light and shadows inside and outside
	Children will have access to a variety of different resources and tools that they can experiment with. Children will also be encouraged to use a wide range of props and materials to act out different stories and characters.					
Expresses and communicates working theories, feelings and understandings using a range of art forms, e.g. movement, dance, drama, music and the visual arts Share their creations, explaining the process they have used. Invent adapt and recount narratives and stories with their peers and their teacher	Throughout the year children will be encouraged to talk about, describe and adapt their creations based on their current knowledge.					
Year 1						
Exploring and Developing: <ul style="list-style-type: none">• Design: design a purposeful, functional product based on simple design criteria• generate, develop and communicate ideas through talking, drawing and modelling.• Make: with support, select from and use a range of tools and equipment to perform practical tasks.• select from and use a range of materials including construction materials and textiles and			Evaluating <ul style="list-style-type: none">• Talk about their design, sharing what they like, dislike and why• Evaluate their ideas and products against design criteria• Suggest improvements.			

explain choices.			
	Unit 1	Unit 2	Unit 3
Key Focus	Structures (DT) - Explorers	Mechanisms (DT) – Looking After Our World (Polar Regions)	Textiles (DT) – Culture, Community and Diversity
Key Skills (Revisit skills from previous learning and build upon them).	<ul style="list-style-type: none"> • With support, select from and use a range of materials including construction materials and textiles, according to their characteristics • Follow instructions to cut and assemble • Join materials appropriately for different situations, e.g. glue, string, tape. • Explore how your structure can be made stronger, stiffer and more stable 	<ul style="list-style-type: none"> • Design a moving storybook for a given audience. • <i>explain how to adapt mechanisms using bridges or guides to control the movement.</i> • Follow a design to create moving models that use levers and sliders. • To know that a mechanism is the parts of an object that move together. • To know that a slider mechanism moves an object from side to side. • To know that a slider mechanism has a slider, slots, guides and an object. • To know that bridges and guides are bits of card that purposefully restrict the movement of the slider. 	<ul style="list-style-type: none"> • Create images from imagination, experience or observation • Cut fabric neatly with scissors • Sequence the steps during making • Learn how to thread a needle, cut, glue and trim material • Use a variety of techniques, e.g. weaving and sewing • Use a variety of media, including fabric.
Outcome	Floating Boat	Moving Story Book	Traditional Patterned Fabric
Key Vocabulary	<i>Material, waterproof, malleable, plastic, paper, join</i>	<i>Sliders, mechanisms, adapt, design criteria, model, template, assemble, input, test</i>	<i>sew, stitch, weave, thread, needle, eye, binca, wool, yarn, material, layer</i>
Year 2			
Exploring and Developing: <ul style="list-style-type: none"> • Design: design purposeful, functional, appealing products for themselves and other users based on design criteria • explore and evaluate a range of existing products • generate, develop, model and communicate their ideas through talking, drawing, templates and mock-ups and where appropriate ICT. • Make: with support, 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 range of materials, textiles, components or ingredients, explaining choices. 		Evaluating and Developing: <ul style="list-style-type: none"> • Talk about their design, sharing what they like, dislike and why • evaluate their ideas and products against design criteria • identify strengths and weaknesses and discuss possible reasons for them • Suggest improvements 	
	Unit 1	Unit 2	Summer 2
Overview	Cooking and Nutrition (DT) - Kenya	Mechanisms (DT) Travel and Transport	Textiles (DT) – The Seaside

Key Skills (Revisit skills from previous learning and build upon them).	<ul style="list-style-type: none"> • use the basic principles of a healthy and varied diet to prepare dishes • understand where food comes from • to find similarities and differences between dishes from another culture and their own, including ingredients used. • to develop the vocabulary to discuss food: taste, smell, or texture • to chop, stir, sprinkle various ingredients. • to follow instructions • use design criteria to review dishes. 	<ul style="list-style-type: none"> • Design a vehicle that includes wheels, axles and axle holders that when combined, will allow the wheels to move. • Select from and use a range of materials and components. • Adapt the mechanisms when: they don't work; fit the vehicle; to improve the vehicle after testing. • Connect wheels to a chassis with an axle and axle holder Use a template to mark out materials. • Understand that the chassis (frame of the vehicle) needs to be balanced. • Use appropriate resources to join materials, e.g. glue, string, etc • Use correct technical vocabulary 	<ul style="list-style-type: none"> • Use a variety of techniques, including appliqué and embroidery • to thread a needle • to choose and cut fabrics • to use a template to cut fabric (pinning) • Stitch, knot and use other manipulative skills • Discuss with the class the success of their stitching.
Outcome	Traditional Kenyan cuisine	A vehicle	Embroidery – seaside imagery.
Key Vocabulary	<i>nutrition, healthy, diet, ingredients, recipe, texture, similar, different, chop, stir, varied</i>	<i>Mechanism, components, join, vehicle, chassis, wheel, axle, axle holder</i>	<i>Sew, stitch, knot, thread, needle, eye, thimble, wool, join, template, pin</i>

Year 3

Exploring and Developing:

- **Design** – use research and develop design criteria to inform the design of innovative and appealing products, aimed at a particular group or individuals.
- Evaluate – investigate and analyse a range of existing products.
- Understand how key events and individuals in design and technology have helped shape the world
- Generate, develop and communicate your ideas through discussion, annotated sketches, cross-sectional diagrams and prototypes.
- **Make** – select from and use a wide range of tools, components and equipment to perform practical tasks with developing accuracy.
- Select from a wide range of materials, textiles, components or ingredients, explaining choices.

Evaluating and Developing:

- **Evaluate** their ideas and product against their own design criteria
- Describe which characteristics of their final design made it effective
- Consider the views of others.
- Make suggestions to modify and improve their work.

	Unit 1	Unit 2	Unit 3
Focus	Structures (DT) - Stone Age to Iron Age	Electrical Systems (DT) – Light (Make a Torch)	Cooking and Nutrition (DT) – Eating Seasonally
Key Skills	<ul style="list-style-type: none"> • Investigate and analyse traditional prehistoric homes: materials, structures, building techniques, e.g. wattle and daub 	<ul style="list-style-type: none"> • Designing a torch, giving consideration to the target audience 	<ul style="list-style-type: none"> • Explain that fruits and vegetables grow in different countries based on their climates • Understand the terms imported and exported

(Revisit skills from previous learning and build upon them).	<ul style="list-style-type: none"> Examine and discuss the significance of these buildings in the chronology of structural (home) design Create a design criterion based upon research Research, experiment and identify appropriate materials to imitate those originally used apply your understanding of how to strengthen, stiffen and reinforce structures. 	<ul style="list-style-type: none"> Understand and explain the purpose of conductors, insulators, the battery and switch and how they will be used in your design. Construct simple electrical circuits using bulbs and switches. Understand how to find a fault in a circuit and how to correct it Work safely with the resources Know and use technical vocabulary relevant to the project 	<ul style="list-style-type: none"> Understand that imported foods travel from far away and this can negatively impact the environment. understand that fruits and vegetables are grown in certain seasons. understand certain dishes are best made according to the seasonality of their ingredients. understand and apply the principles of a healthy and varied diet To follow instructions within a recipe understand basic rules of food hygiene and safety use design criteria to test and review their dishes.
Outcome	Traditional Bronze Age home	Make a torch	To create a seasonal dish – a savoury tart
Key Vocabulary	<i>Wattle (woven wood), daub (mud), structure, stability, prehistoric, technique, archaeology, thatch, roundhouse.</i>	<i>Battery input electricity series circuit component switch target audience model evaluation design criteria LED packaging properties bulb conductor circuit diagram insulator buzzer</i>	<i>Savoury, season, nutrition, diet, nutritious, taste, climate, impact, environment, vegetation, imported, exported, natural, processed, recipe, ingredients.</i>

Year 4

Exploring and Developing:

- **Design** - use research from a variety of sources and develop design criteria to inform the design of innovative and appealing products, aimed at a particular group or individuals.
- Evaluate – investigate and analyse a range of existing products.
- Understand how key events and individuals in design and technology have helped shape the world.
- Generate, develop and communicate your ideas through discussion, annotated sketches, cross-sectional diagrams, prototypes or pattern pieces.
- **Make** – select from and use a wider range of tools and equipment to perform practical tasks accurately.
- Select from and use a wider range of materials, ingredients and textiles according to their characteristics, functional properties and aesthetic appeal, explaining your choices.

Evaluating and Developing:

- Evaluate their ideas and product against their own design criteria
- Reflect on effective and ineffective designs and their design process
- Describe characteristics that make their final product effective
- Consider the views of others.
- Suggest modifications that could improve their design.

	Autumn 1	Unit 2	Unit 3
Focus	Cooking and Nutrition (DT) and Collage – Food and the Environment	Drawing and Textiles (DT) - Rivers	Structures (DT) – Anglo-Saxons and Vikings

Key Skills (Revisit skills from previous learning and build upon them).	<ul style="list-style-type: none"> Understand seasonality and know where and how varied ingredients are grown, reared, caught and processed. understand and apply the principles of a healthy and varied diet. Follow a recipe from start to finish. Adapt a recipe to improve it or meet new criteria (e.g. from savoury to sweet). select and use appropriate equipment to perform practical tasks accurately and according to their functional properties. Cook safely, following basic hygiene rules use design criteria to test and review dishes. Suggest modifications for improvement: recipe, preparation or cooking process. 	<ul style="list-style-type: none"> Choose textiles as a means of extending work already achieved Collect visual information from a variety of sources, describing with vocabulary based on the visual and tactile elements. Research style, materials, media and techniques used by the focus artist and consider how these can be replicated refine and alter ideas and explain choices using technical vocabulary. Select materials, tools and techniques (e.g. cross-stitch? Appliqué?) needed to complete design, according to functional properties Select appropriate technique (cross-stitch, appliqué) according to need, e.g. cross-stitch to join fabric, appliqué to decorate fabric. Thread needle with greater independence. Tying knots with greater independence. 	<ul style="list-style-type: none"> Decide on design criteria following historical research, and functional requirements Select materials, tools and techniques needed to complete design, according to functional properties Create a range of different shapes, frames and structures to experiment Adjust the design following mock-ups and experiments apply your understanding of how to strengthen, stiffen and reinforce your structure.
Outcome	A Pizza	Embroidery – river scene	Traditional Viking Long Boat
Key Vocabulary	<i>seasonality, quality, balance, fresh, processed ingredients, diet, nutrition, hygiene, recipe</i>	<i>sew, stitch, weave, loom, thread, needle, eye, embroidery, cross-stitch, appliqué, seam, material, layer, cover, batik, resist, dye</i>	<i>Research, develop, criteria, diagrams, tools, evaluate, structure, frame, overlapping, join, reinforce, longship, hull, mast, stern, keel, sail, shields, flotation</i>

Year 5

Exploring and Developing:

- **Design** - use research from a variety of sources and develop design criteria to inform the design of innovative and appealing products, aimed at a particular group or individuals.
- Evaluate – investigate and analyse a range of existing products.
- Understand how key events and individuals in design and technology have helped shape the world.
- Generate, develop and communicate your ideas through discussion, annotated sketches, cross-sectional, exploded diagrams, prototypes or computer-aided design.
- **Make** – select from and use a wider range of tools and equipment to perform practical tasks accurately.
- Select from and use a wider range of materials, ingredients or components according to their characteristics, functional properties and aesthetic appeal, especially those that are sustainable. Justify your choices.

Evaluating and Developing:

- Evaluate their ideas and product against their own design criteria
- Explain key functions and features of their product.
- Reflect on effective and ineffective designs and their design process
- Describe characteristics that make their product effective (considering purpose and audience).
- Be expressive and analytical, considering the view of others: to adapt, extend and justify their work.

	Unit 1	Unit 2	Unit 3
Focus	Mechanisms (DT) – Pop Up Book – Living things and their Habitats	Future Cities Project (DT) - Space	Cooking and Nutrition (DT) – What Could Be Healthier?

Key Skills (Revisit skills from previous learning and build upon them).	<ul style="list-style-type: none"> Design a pop-up book with a mixture of structures and mechanisms. Name each mechanism, input and output accurately. Storyboard ideas for a book Illustrate design ideas with annotated sketches and exploded diagrams. Make mechanisms and / or structures using sliders, pivots and folds to produce movement. Use layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result. 	<ul style="list-style-type: none"> Research and reflect on the essential needs of a city and buildings on mars (e.g. housing, food, transport, power) and the location itself (e.g. resources, atmosphere, temperature and landscape) and incorporate this into your design brief and subsequent designs. Reflect upon the work and ideas of other designers. Use annotated sketches and prototypes to communicate your ideas. Experiment with materials and techniques, adapting your design accordingly. Develop an awareness of sustainable design. apply your understanding of how to strengthen, stiffen and reinforce structures. 	<ul style="list-style-type: none"> Adapt a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients. Write an amended method for a recipe to incorporate the relevant changes to ingredients. Designing appealing packaging to reflect a recipe. Understand and apply the principles of a health and varied diet. Cut and prepare vegetables safely. Use equipment safely, including knives, hot pans and hobs. Know what cross- contamination is and how to avoid it. Follow a step by step method carefully to make a recipe. Identify the nutritional differences between different products and recipes. Identify and describe healthy benefits of food groups.
Outcome	Pop-Up Book	A building for a city on planet Mars	Spaghetti Bolognese (meat / meat substitute)
Key Vocabulary	<i>Mechanism, structures, slider, pivot, fold, layers, spaces, movement, join, design, storyboard, research, evaluate</i>	<i>Structure, frame, stable, support, reinforce, materials, environment, atmosphere, Zaha Hadid, Ken Yeang, Hundred Wasser Mali and Burkino Faso</i>	<i>Beef Meat substitute Processed Diet Reared Ethical ingredients, farm, supermarket, balanced</i>

Year 6

Exploring and Developing:

- **Design** - use research from a variety of sources and develop design criteria to inform the design of innovative and appealing products, aimed at a particular group or individuals.
- Evaluate – investigate and analyse a range of existing products.
- Understand how key events and individuals in design and technology have helped shape the world.
- Generate, develop and communicate your ideas through discussion, annotated sketches, cross-sectional, exploded diagrams, prototypes or computer-aided design.
- Refine and alter ideas and explain choices using technical vocabulary.
- **Make** – select from and use a wider range of tools and equipment to perform practical tasks accurately.

Evaluating and Developing:

- Evaluate their ideas and product against their own design criteria
- Explain key functions and features of their product.
- Reflect on effective and ineffective designs and their design process
- Describe characteristics that make their product effective (considering purpose and audience).
- Be expressive and analytical, considering the view of others: to adapt, extend and justify their work.

<ul style="list-style-type: none"> Select from and use a wider range of materials and components according to their characteristics, functional properties and aesthetic appeal, especially those that are sustainable. Justify your choices. 			
	Unit 1	Unit 2	Unit 3
Focus	Textiles (DT) – The Mayans	Digital Navigation (DT) - Europe	Electrical Systems (DT) – steady hand game.
Key Skills (Revisit skills from previous learning and build upon them).	<ul style="list-style-type: none"> Reflect on traditional Mayan techniques, materials and aesthetics when establishing criteria and experimenting with design. To understand the traditions behind Maya weaving techniques and aesthetics. Collect visual information from a variety of sources, describing with vocabulary based on the visual and tactile elements. To experiment with materials and techniques, creating mock-ups Refine and alter ideas and explain choices using technical vocabulary. Show an awareness of sustainable design. 	<ul style="list-style-type: none"> Write a design brief from information submitted by a client. Develop design criteria to fulfil the client's request. Consider and suggest additional functions for my navigation tool. Developing a product idea through annotated sketches. Placing and manoeuvring 3D objects using CAD Changing properties of, or combine one or more 3D objects using CAD Consider materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo). Explain material choices and why they were chosen as part of a product concept. Programme a N, E, S, W cardinal compass. Know that accelerometers can detect movement. Understand that sensors can be useful in products as they mean the product can function without human input. Evaluate: Explain key functions and features of navigation tool as part of product pitch. 	<ul style="list-style-type: none"> Design a steady hand game – identifying and naming the components needed. Gather images and information of existing children's toys to analyse. Illustrate your design through annotated sketches and exploded diagrams. Model ideas through prototypes Understand the purpose of your product, recognising and using terms like, 'fit for purpose' and 'form over function', i.e. the purpose of the product determine the design.. Construct a stable base for the game. Accurately cut, fold and assemble a net. Incorporating a circuit into the base – testing beforehand.
Outcome	Traditional Mayan Weaving	A Navigation Tool	Steady Hand Game
Key Vocabulary	<i>sew, stitch, weave, textiles, traditional, backstrap loom, thread, batten, motif, huipiles, needle, eye, binca, zigzag stitch, side stitch, running stitch, wool</i>	<i>Smart, equipment, cardinal compass, design brief, client, program, smartphone, navigation, application (apps), GPS Tracker, function, duplicate, loop, value, Boolean, moudable</i>	<i>Assemble, buzzer, bulb, battery pack, circuit symbol, conductor, battery, benefit, bulb holder, circuit, component, coper fine motor skills, form, gross motor skills, LED, user, function, insulator</i>