LOWER KEY STAGE 2

# Design and Technology

| | TOPIC | National Curriculum | Knowledge<br>*What do we want the children to know? Personalised to our topics/local area* | Vocabulary | Resources: |
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| Year A | **Cushions** | Understand that fabric can be layered for effect, recognising the appearance and technique for different stitch and fastening types, including their: ● Strength. ● Appropriate use. ● Design.<br>To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric •To know that when two edges of fabric have been joined together it is called a seam •To know that it is important to leave space on the fabric for the seam •To understand that some products are turned inside out after sewing so the stitching is hidden | Introduce two new skills to add to the pupils' repertoire: cross stitch and appliqué. Pupils apply their knowledge to the design, decoration and assembly of their own cushions.<br>•To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric •To know that when two edges of fabric have been joined together it is called a seam •To know that it is important to leave space on the fabric for the seam •To understand that some products are turned inside out after sewing so the stitching is hidden | Accurate, Applique, Cross-stitch, Cushion, Decorate, Detail, Fabric, Patch, Running-stitch, Seam, Stencil, Stuffing, Target Audience | https://www.kapowprimary.com/subjects/design-technology/lower-key-stage-2/year-3/textiles-cushions/ |
| | **Electric Poster** | Create functional electrical products that use series circuits, incorporating different components such as bulbs, LEDs, switches, buzzers and motors. Consider how the materials used in these products can: ● Protect the circuitry. ● Reflect light. ● Conduct electricity. ● Insulate. | An introduction to information design and electrical systems, pupils create an electric poster using a basic circuit to develop a museum display about The Romans.<br>• To understand that an electrical system is a group of parts (components) that work together to transport electricity around a circuit • To understand common features of an electric product (switch, battery or plug, dials, buttons etc.) • To list examples of common electric products (kettle, remote control etc.) • To understand that an electric product uses an electrical system to work (function) • To know the name and appearance of a bulb, battery, battery holder and crocodile wire to build simple circuits<br>To understand the importance and purpose of information design • To understand how material choices (such as mounting paper to | | https://www.kapowprimary.com/subjects/design-technology/lower-key-stage-2/year-3/electrical-systems-electric-poster/ |

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| | | | corrugated card) can improve a product to serve its purpose (remain rigid without bending when the electrical circuit is attached). | | |
| | **Pneumatic Toys** | Extend pupils understanding of individual mechanisms, to form part of a functional system, for example: Automatas, that use a combination of cams, followers, axles/shaft, cranks and toppers. | Design and create a toy with a pneumatic system, learning how trapped air can be used to create a product with moving parts. Pupil are introduced to thumbnail sketches and exploded diagrams.<br>To understand how pneumatic systems work • To understand that pneumatic systems can be used as part of a mechanism • To know that pneumatic systems operate by drawing in, releasing and compressing air<br>To understand how sketches, drawings and diagrams can be used to communicate design ideas • To know that exploded-diagrams are used to show how different parts of a product fit together • To know that thumbnail sketches are small drawings to get ideas down on paper quickly | Exploded-diagram, Function, Input, Linkage, Mechanism, Motion, Net, Output, Pivot, Pneumatic System, Thumbnail Sketch | https://www.kapowprimary.com/subjects/design-technology/lower-key-stage-2/year-3/mechanical-systems-pneumatic-toys/ |
| | **Electronic Charm** | Learn how to develop an electronic product with processing capabilities. Apply Computing principles to program functions within a product including to control and monitor it. Understand how the history and evolution of product design lead to the on-going Digital revolution and the impact it is having in the world today. | Design, code, make and promote a Micro:bit electronic charm to use in low-light conditions, developing their understanding of programming to monitor and control products to solve a design scenario.<br>To understand that in programming a 'loop' is code that repeats something again and again until stopped • To know that a Micro:bit is a pocket-sized, codeable computer • Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm<br>•To know what the 'Digital Revolution' is and features of some of the products that have evolved as a result •To know that in Design and technology the term 'smart' means a programmed product •To know the difference between analogue and digital technologies • To understand what is meant by 'point of sale display' • To know that CAD stands for Computer-aided design | | https://www.kapowprimary.com/subjects/design-technology/lower-key-stage-2/year-3/digital-world/ |
| | **Eating Seasonally** | Understand and apply the principles of a healthy and varied diet to prepare and cook | Pupils discover when and where fruits and vegetables are grown and learn about seasonality in the UK. They look at the | Eating, Climate, Dry Climate, Exported, | https://www.kapowprimary.com/ |

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| | | a variety of dishes using a range of cooking techniques and methods. Understand what is meant by seasonal foods. Know where and how ingredients are sourced. | relationship between the colour of fruits and vegetables and their health benefits by making three dishes.<br><br>To know that not all fruits and vegetables can be grown in the UK • To know that climate affects food growth • To know that vegetables and fruit grow in certain seasons • To know that cooking instructions are known as a 'recipe' • To know that imported food is food which has been brought into the country • To know that exported food is food which has been sent to another country. • To understand that imported foods travel from far away and this can negatively impact the environment • To know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre • To understand that vitamins, minerals and fibre are important for energy, growth and maintaining health • To know safety rules for using, storing and cleaning a knife safely • To know that similar coloured fruits and vegetables often have similar nutritional benefits | Imported, Mediterranean Climate, Nationality, Nutrients, Polar Climate, Recipe, Seasonal Food, Seasons, Temperate Climate, Tropical Climate | subjects/design-technology/lower-key-stage-2/year-3/food-eating-seasonally/ |
| | **Constructing a castle** | Continue to develop KS1 exploration skills, through more complex builds such as pavilion and bridge designs. Understand material selection and learn methods to reinforce structures. | Learning about the features of a castle, pupils design and make one of their own. They will also be using configurations of handmade nets and recycled materials to make towers and turrets before constructing a stable base.<br><br>To understand that wide and flat based objects are more stable • To understand the importance of strength and stiffness in structures<br><br>To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose • To know that a façade is the front of a structure • To understand that a castle needed to be strong and stable to withstand enemy attack • To know that a paper net is a flat 2D shape that can become a 3D shape once assembled • To know that a design specification is a list of success criteria for a product | 2D Shapes, 3D Shapes, Castle, Design Criteria, Evaluation, Facade, Feature, Flag, Net, Recyclable, Scoring, Stable, Strong, Structure, Tab, Weak | https://www.kapowprimary.com/subjects/design-technology/lower-key-stage-2/year-3/structures-constructing-a-castle/ |
| Year B | **Torches** | Create functional electrical products that use | Pupils apply their scientific understanding of electrical circuits to | Battery, Bulb, Buzzer, Cell, Conductor, | https://www.kapowprimary.com/ |

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| | | series circuits, incorporating different components such as bulbs, LEDs, switches, buzzers and motors. Consider how the materials used in these products can: ● Protect the circuitry. ● Reflect light. ● Conduct electricity. ● Insulate. | create a torch made from recycled and reclaimed materials and objects. They design and evaluate their product against set design criteria.<br><br>To understand that electrical conductors are materials which electricity can pass through • To understand that electrical insulators are materials which electricity cannot pass through • To know that a battery contains stored electricity that can be used to power products • To know that an electrical circuit must be complete for electricity to flow • To know that a switch can be used to complete and break an electrical circuit<br><br>To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens • To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison | Copper, Design Criteria, Electrical Item, Electricity, Electronic Item, Insulator, Series Circuit, Switch, Wire, Test, Torch | subjects/design-technology/lower-key-stage-2/year-4/electrical-systems-torches/ |
| | **Making a Slingshot Car** | Extend pupils understanding of individual mechanisms, to form part of a functional system, for example: Automatas, that use a combination of cams, followers, axles/shaft, cranks and toppers. | Transform lollipop sticks, wheels, dowel and straws into a moving car. Pupils use a glue gun to construct, make the launch mechanism, design and create the chassis of a vehicle using nets.<br><br>• To understand that all moving things have kinetic energy • To understand that kinetic energy is the energy that something (object/person) has by being in motion • To know that air resistance is the level of drag on an object as it is forced through the air • To understand that the shape of a moving object will affect how it moves due to air resistance.<br><br>To understand that products change and evolve over time • To know that aesthetics means how an object or product looks in design and technology • To know that a template is a stencil you can use to help you draw the same shape accurately • To know that a birds-eye view means a view from a high angle (as if a bird in flight) • To know that graphics are images which are designed to explain or advertise something •To know that it is important to assess and evaluate design ideas and models against a list of design criteria. | Aesthetic, Air Resistance, Chassis, Design, Design Criteria, Function, Graphics, Kinetic Energy, Mechanism, Net, Structure | https://www.kapowprimary.com/subjects/design-technology/lower-key-stage-2/year-4/year-4-digital-world/ |

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| | **Mindful Moments Timer** | Learn how to develop an electronic product with processing capabilities. Apply Computing principles to program functions within a product including to control and monitor it. Understand how the history and evolution of product design lead to the on-going Digital revolution and the impact it is having in the world today. | Design, program, prototype and brand a Micro:bit timer to a specified amount of minutes. Pupils carry out research and existing product analysis to determine how a programmable product could be personalised to their needs.<br><br>To understand what variables are in programming • To know some of the features of a Micro:bit • To know that an algorithm is a set of instructions to be followed by the computer • To know that it is important to check my code for errors (bugs) • To know that a simulator can be used as a way of checking your code works before installing it onto an electronic device<br><br>•Understand the terms 'ergonomic' and 'aesthetic' •Know that a prototype is a 3D model made out of cheap materials, that allows us •To test design ideas and make better decisions about size, shape and materials | | https://www.kapowprimary.com/subjects/design-technology/lower-key-stage-2/year-4/year-4-digital-world/ |
| | **Adapting a Recipe** | Understand and apply the principles of a healthy and varied diet to prepare and cook a variety of dishes using a range of cooking techniques and methods. Understand what is meant by seasonal foods. Know where and how ingredients are sourced. | Work in groups to adapt a simple biscuit recipe, to create the tastiest biscuit ensuring that their creation comes within the given budget of overheads and costs of ingredients.<br><br>To know that the amount of an ingredient in a recipe is known as the 'quantity' • To know that it is important to use oven gloves when removing hot food from an oven • To know the following cooking techniques: sieving, creaming, rubbing method, cooling •To understand the importance of budgeting while planning ingredients for biscuits | Adapt, Budget, Building, Equipment, Evaluation, Flavour, Ingredients, Method, net, Packaging, Prototype, Quantity, Recipe, Target Audience, Unit of Measurement, Utilities | https://www.kapowprimary.com/subjects/design-technology/lower-key-stage-2/year-4/food-adapting-a-recipe/ |
| | **Pavilions** | Continue to develop KS1 exploration skills, through more complex builds such as pavilion and bridge designs. Understand material selection and learn methods to reinforce structures. | Exploring pavilion structures, learning about what they are used for and investigate how to create strong and stable structures before designing and creating their own pavilions, complete with cladding.<br><br>To understand what a frame structure is • To know that a 'free-standing' structure is one which can stand on its own<br><br>To know that a pavilions ia a decorative building or structure for leisure activities • To know that cladding can be applied to structures for different effects. • To know that aesthetics are how | Aesthetic, Cladding, Design Criteria, Evaluation, Frame Structure, Function, Inspiration, Pavilion, Reinforce, Stable, Structure, Target Audience, Target Customer, Texture, Theme | https://www.kapowprimary.com/subjects/design-technology/lower-key-stage-2/year-4/structure-pavilions/ |

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| | | | a product looks • To know that a product's function means its purpose • To understand that the target audience means the person or group of people a product is designed for • To know that architects consider light, shadow and patterns when designing | | |
| | **Fastenings** | Understand that fabric can be layered for effect, recognising the appearance and technique for different stitch and fastening types, including their: ● Strength. ● Appropriate use. ● Design. | Building upon their sewing skills from previous years, pupils design and create a book sleeve; exploring a variety of fastenings and selecting the most appropriate for their design based on strength and appropriate-use.<br><br>To know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and velcro • To know that different fastening types are useful for different purposes • To know that creating a mock up (prototype) of their design is useful for checking ideas and proportions | Aesthetic, Assemble, Book Sleeve, Design Criteria, Evaluation, Fabric, Fastening, Prototype, Net, Running-Stitch, Stencil, Target Audience, Target Customer, Template | https://www.kapowprimary.com/subjects/design-technology/lower-key-stage-2/year-4/textiles-fastenings/ |