UPPER KEY STAGE 2
Design and Technology

SUBJECT

Year A	Topic	National curriculum	Knowledge	Vocabulary	Resources
	Playgrounds	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.	Design and create a model for a new playground featuring five apparatus, made from three different structures. Using a footprint as the base, practise visualising objects in plan view and get creative including natural features. To know that structures can be strengthened by manipulating materials and shapes • To understand what a 'footprint plan' is • To understand that in the real world, design , can impact users in positive and negative ways • To know that a prototype is a cheap model to test a design idea	Apparatus, Bench Hook, Coping Saw, Dowel, Jelutong, Markout, Modify, Natural Materials, Plan View, Playground, Prototype, Reinforce, Structure, Tenon Saw, User, Vice	https://www.kapowprimary.com/subjects/design-technology/upper-key-stage-2/year-6/structure-playgrounds
	Navigating the World	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.	Program a navigation tool to produce a multifunctional device for trekkers. Combine 3D virtual objects to form a complete product concept in 3D computer-aided design modelling software. To know that accelerometers can detect movement • To understand that sensors can be useful in products as they mean the product can function without human input To know that designers write design briefs and develop design criteria to enable them to fulfil a client's request • To know that 'multifunctional' means an object or product has more than one function • To know that magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing	Biodegradable, Boolean, Environmentally Friendly, Finite, If Statement, Mouldable, Product Lifecycle, Product Lifespan, Smart, Sustainable	https://www.kapowprimary.com/subjects/design-technology/upper-key-stage-2/year-6/digital-world-navigating-the-world/
	Automata 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.	Use woodworking skills, pupils construct an automata; measuring and cutting their materials, assembling the frame, choosing cams and designing the characters that sit on the followers to form an interactive shop display. • To understand that the mechanism in an automata uses a system of cams, axles and followers • To understand that different shaped cams produce different outputs	Assembly-diagram, Axle, Bench Hook, Clamp, Cam, Component, Cutting List, Dowel, Drill Bits, Exploded Diagram, Finish, Follower, Frame, Function, Hand Drill, Jelutong,	https://www.kapowprimary.com/subjects/design-technology/upper-key-stage-2/year-6/mechanical-systems-automata-toys/

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			To know that an automata is a hand powered mechanical toy • To know that a cross-sectional diagram shows the inner workings of a product • To understand how to use a bench hook and saw safely • To know that a set square can be used to help mark 90° angles	Linkage, Mark Out, Set Square or Engineer's Square, Tenon Saw	
	Steady Hand Game	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.	Design and create a steady hand game, use nets to create the bases and apply knowledge of electrical circuits to build an operational circuit with a buzzer that completes the circuit when the handle makes contact with the wire. To know that batteries contain acid, which can be dangerous if they leak • To know the names of the components in a basic series circuit including a buzzer To know that 'form' means the shape and appearance of an object •To know the difference between 'form' and 'function' •To understand that 'fit for purpose' means that a product works how it should and is easy to use • To know that form over purpose means that a product looks good but does not work very well • To know the importance of 'form follows function' when designing: the product must be designed primarily with the function in mind • To understand the diagram perspectives 'top view', 'side view' and 'back'	Backboard, Battery, Bulb, Buzzer, Circuit, Conductor, Copper, Function, Insulator, LED, Magnetic Field, Net, Pliers, Prototype, Series Circuit, Side View Drawing, Test, Top View Drawing	https://www.kapowprimary.com/subjects/design-technology/upper-key-stage-2/year-6/electrical-systems-steady-hand-game/
	Electronic Greetings cards	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.	Explore how circuits can be adapted to suit different purposes, explore series circuits and recreate one using conductive adhesive copper tape. Apply this knowledge to design and create an electronic greeting card. To know the key components used to create a functioning circuit • To know that copper is a conductor and can be used as part of a circuit • To understand that breaks in a circuit will stop it from working • To understand that a series circuit only has one path for the electrical current to flow from positive to negative • To know that we use symbols to represent components in a circuit diagram • To know the names of the components in a basic series circuit: crocodile wires, LED (light-emitting diode), battery	Battery, Buzzer, Circuit, Component, Conductor, Copper, Design, Design Criteria, Function, Graphite, Innovative, Insulator, LED, Modify, Parallel Circuit, Series Circuit, Switch, Target Audience, Test, Wire	https://www.kapowprimary.com/subjects/design-technology/upper-key-stage-2/year-5/electrical-systems-electronic-greetings-cards/

			holder, battery, cell • To know that product analysis is critiquing the strengths and weaknesses of a product • To know that 'mass production' is when a product is made in large quantities by a machine, usually in a factory • To know that one-off production is when only one of a product is made by hand • To know that 'bespoke' means a product was made for a particular reason or person • To understand the development of personal message exchange through to the invention of the Penny Black stamp, and exchanging of greeting cards • To know that a moodboard may include words, sketches, textures, colours, material samples etc. and can act as inspiration when designing		
	Come Dine With Me	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.	Research and prepare a three-course meal and taste-test and score their food. Research the journey of their main ingredient from 'farm to fork' or write a favourite recipe. • To know that 'flavour' is how a food or drink tastes • To know that many countries have 'national dishes' which are recipes associated with that country • To know that 'processed food' means food that has been put through multiple changes in a factory • To understand that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides • To understand what happens to a certain food before it appears on the supermarket shelf (Farm to Fork)	Accompaniment, Cross-contamination, Equipment, Farm, Flavour, Imperative verb, Ingredients, Method, Nationality, Preparation, Proceed, Reared, Recipe, Target Audience, Unit of measure	https://www.kapowprimary.com/subjects/design-technology/upper-key-stage-2/year-6/food-come-dine-with-me/
Year B	**Topic**	**National curriculum**	**Knowledge**	**Vocabulary**	**Resources**
	What Could Be Healthier	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.	Research and modify a traditional bolognese sauce recipe to make it healthier. Cook improved versions, creating appropriate packaging and learn about where the ingredients the importance of animal welfare when farming cattle. To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues • To know that I can adapt a recipe to make it healthier by substituting ingredients • To know that I can use a	Beef, Cross-contamination, Farm, Method, Packaging, Research, Welfare	https://www.kapowprimary.com/subjects/design-technology/upper-key-stage-2/year-5/food-what-could-be-healthier/

			nutritional calculator to see how healthy a food option is • To understand that 'cross-contamination' means that bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects		
	Stuffed Toys	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.	Create a stuffed toy by applying skills learnt in previous units. Introduce blanket stitch. To know that blanket stitch is useful to reinforce the edges of a fabric material or join two pieces of fabric • To understand that it is easier to finish simpler designs to a high standard • To know that soft toys are often made by creating appendages separately and then attaching them to the main body • To know that small, neat stitches which are pulled taut are important to ensure that the soft toy is strong and holds the stuffing securely	Accurate, Annotate, Appendage, Blanket-stitch, Design Criteria, Detail, Evaluation, Fabric, Sew, Shape, Stuffed Toy, Stuffing, Template	https://www.kapowprimary.com/subjects/design-technology/upper-key-stage-2/year-5/textiles-stuffed-toys/
	Monitoring Devices	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.	Program a Micro: bit animal monitoring device that will alert the owner when the temperature is not optimal. Develop 3D CAD skills by learning how to navigate the Tinkercad interface and essential tools. • To know that a 'device' means equipment created for a certain purpose or job and that monitoring devices observe and record • To know that a sensor is a tool or device that is designed to monitor, detect and respond to changes for a purpose • To understand that conditional statements (and, or, if booleans) in programming are a set of rules which are followed if certain conditions are met To understand key developments in thermometer history • To know events or facts that took place over the last 100 years in the history of plastic, and how this is changing our outlook on the future • To know the 6Rs of sustainability • To understand what a virtual model is and the pros and cons of traditional vs CAD modelling	Boolean, Device, Durable, Monitoring Device, Sensor, Synthetic, variable, Versatile, Water-resistant, Workplane (CAD)	https://www.kapowprimary.com/subjects/design-technology/upper-key-stage-2/year-5/digital-world-monitoring-devices/
	Bridges	Continue to develop KS1 exploration skills,	After learning about various types of bridges and exploring how	Accurate, Arch Bridge, Beam Bridge,	https://www.kapowprimary.com/

		through more complex builds such as pavilion and bridge designs. Understand material selection and learn methods to reinforce structures.	the strength of structures can be affected by the shapes used, create their own bridge and test its durability - using woodworking tools and techniques. To understand some different ways to reinforce structures • To understand how triangles can be used to reinforce bridges • To know that properties are words that describe the form and function of materials • To understand why material selection is important based on their properties • To understand the material (functional and aesthetic) properties of wood To understand the difference between arch, beam, truss and suspension bridges • To understand how to carry and use a saw safely	Bench Hook, Compression, Coping Saw, File, Mark Out, Reinforce, Sandpaper, Set Square or Try Square, Shape, Structure, Suspension Bridge, Tenon Saw, Tension, Truss bridge	subjects/design-technology/upper-key-stage-2/year-5/structure-bridges/
	Waistcoats	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.	Select fabrics, use templates, pin, decorate and stitch materials together to create a waistcoat for a person or purpose of their choosing. Create or use a pattern template to fit a desired person or item (e.g. teddy bear). To understand that it is important to design clothing with the client/ target customer in mind • To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric • To understand the importance of consistently sized stitches	Adapt, Annotate, Detail, Fabric, Fastening, Knot, Properties, Running Stitch, Seam, Sew, Shape, Target Audience, Target Customer, Template, Thread, Unique, Waistcoat, Waterproof	https://www.kapowprimary.com/subjects/design-technology/upper-key-stage-2/year-6/textiles-waistcoats/
	Pop Up Books	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.	Create a four-page pop-up story book design, incorporating a range of functional mechanisms that use levers, sliders, layers and spacers to give the illusion of movement through interaction. • To know that mechanisms control movement • To understand that mechanisms that can be used to change one kind of motion into another • To understand how to use sliders, pivots and folds to create paper-based mechanisms • To know that mechanisms control movement • To understand that mechanisms that can be used to change one kind of motion into another • To understand how to use sliders, pivots and folds	Aesthetic, CAD, Caption, Design, Design Brief, Design Criteria, Exploded Diagram, Function, Input, Linkage, Mechanism, Motion, Output, Pivots, Prototype, Sliders, Structure, Template	https://www.kapowprimary.com/subjects/design-technology/upper-key-stage-2/year-5/mechanical-systems-making-a-pop-up-book/

			to create paper-based mechanisms		