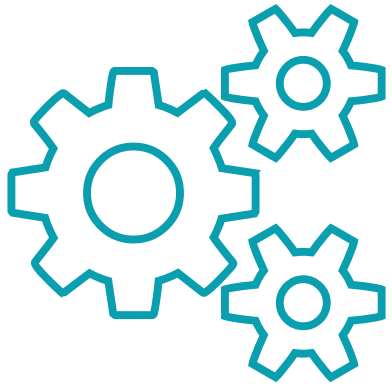

Design & Technology Pupil Progression

Kapow Primary™

Design

Make

Evaluation

Technical knowledge

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Structures	• Learning the importance of a clear design criteria • Including individual preferences and requirements in a design	• Generating and communicating ideas using sketching and modelling • Learning about different types of structures, found in the natural world and in everyday objects	• Designing a castle with key features to appeal to a specific person/ purpose • Drawing and labelling a castle design using 2D shapes, labelling: - the 3D shapes that will create the features - materials need and colours	• Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect • Building frame structures designed to support weight	• Designing a stable structure that is able to support weight • Creating frame structure with focus on triangulation	• Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs
Mechanisms	• Explaining how to adapt mechanisms, using bridges or guides to control the movement • Designing a moving story book for a given audience • Designing a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move • Creating clearly labelled drawings which illustrate movement	• Creating a class design criteria for a moving monster • Designing a moving monster for a specific audience in accordance with a design criteria • Selecting a suitable linkage system to produce the desired motions • Designing a wheel • Selecting appropriate materials based on their properties	• Designing a toy which uses a pneumatic system • Developing design criteria from a design brief • Generating ideas using thumbnail sketches and exploded diagrams • Learning that different types of drawings are used in design to explain ideas clearly	• Designing a shape that reduces air resistance • Drawing a net to create a structure from • Choosing shapes that increase or decrease speed as a result of air resistance • Personalising a design	• Designing a pop-up book which uses a mixture of structures and mechanisms • Naming each mechanism, input and output accurately • Storyboarding ideas for a book	• After experimenting with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement • Understanding how linkages change the direction of a force • Making things move at the same time

Design

Make

Evaluation

Technical knowledge

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Electrical Systems	• N/A	• N/A	• Designing a game that works using static electricity, including the instructions for playing the game • Identifying a design criteria and a target audience	• Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas	• Designing an electronic greetings card with a simple electrical control circuit • Creating a labelled design showing positive and negative parts in relation to the LED and the battery	• Designing a steady hand game - identifying and naming the components required • Drawing a design from three different perspectives • Generating ideas through sketching and discussion • Modelling ideas through prototypes
Cooking and Nutrition	• N/A	• Designing a healthy wrap based on a food combination which work well together	• Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish	• Designing a biscuit within a given budget, drawing upon previous taste testing	• Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients • Writing an amended method for a recipe to incorporate the relevant changes to ingredients • Designing appealing packaging to reflect a recipe	• Writing a recipe, explaining the key steps, method and ingredients • Including facts and drawings from research undertaken

Design

Make

Evaluation

Technical knowledge

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Textiles	• Using a template to create a design for a puppet	• Designing a pouch	• Designing and making a template from an existing cushion and applying individual design criteria	• Writing design criteria for a product, articulating decisions made • Designing a personalised Book sleeve	• Designing a stuffed toy considering the main component shapes required and creating an appropriate template • Considering proportions of individual components	• Designing a waistcoat in accordance to specification linked to set of design criteria to fit a specific theme • Annotating designs

Kapow Primary™

Design

Make

Evaluation

Technical knowledge

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Structures	• Making stable structures from card, tape and glue • Following instructions to cut and assemble the supporting structure of a windmill • Making functioning turbines and axles which are assembled into a main supporting structure	• Making a structure according to design criteria • Creating joints and structures from paper/card and tape	• Constructing a range of 3D geometric shapes using nets • Creating special features for individual designs • Making facades from a range of recycled materials	• Creating a range of different shaped frame structures • Making a variety of free standing frame structures of different shapes and sizes • Selecting appropriate materials to build a strong structure and for the cladding • Reinforcing corners to strengthen a structure • Creating a design in accordance with a plan • Learning to create different textural effects with materials	• Making a range of different shaped beam bridges • Using triangles to create truss bridges that span a given distance and supports a load • Building a wooden bridge structure • Independently measuring and marking wood accurately • Selecting appropriate tools and equipment for particular tasks • Using the correct techniques to saws safely • Identifying where a structure needs reinforcement and using card corners for support	• Building a range of play apparatus structures drawing upon new and prior knowledge of structures • Measuring, marking and cutting wood to create a range of structures • Using a range of materials to reinforce and add decoration to structures

Kapow Primary™

Design

Make

Evaluation

Technical knowledge

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Mechanisms	• Following a design to create moving models that use levers and sliders • Adapting mechanisms	• Making linkages using card for levers and split pins for pivots • Experimenting with linkages adjusting the widths, lengths and thicknesses of card used • Cutting and assembling components neatly • Selecting materials according to their characteristics • Following a design brief	• Creating a pneumatic system to create a desired motion • Building secure housing for a pneumatic system • Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy • Selecting materials due to their functional and aesthetic characteristics • Manipulating materials to create different effects by cutting, creasing, folding, weaving	• Measuring, marking, cutting and assembling with increasing accuracy • Making a model based on a chosen design	• Following a design brief to make a pop up book, neatly and with focus on accuracy • Making mechanisms and/or structures using sliders, pivots and folds to produce movement • Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result	• Measuring, marking and checking the accuracy of the jelutong and dowel pieces required • Measuring, marking and cutting components accurately using a ruler and scissors • Assembling components accurately to make a stable frame • Understanding that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles • Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set

Kapow Primary™

Design

Make

Evaluation

Technical knowledge

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Electrical Systems	• N/A	• N/A	• Making an electrostatic game, referring to the design criteria • Using a wider range of materials and equipment safely • Using electrostatic energy to move objects in isolation as well as in part of a system	• Making a torch with a working electrical circuit and switch • Using appropriate equipment to cut and attach materials • Assembling a torch according to the design and success criteria	• Making a working circuit • Creating an electronics greeting card, referring to a design criteria • Mapping out where different components of the circuit will go	• Making electromagnetic motors and tweaking the motor to improve its function • Constructing a stable base for an electromagnetic game • Accurately cutting, folding and assembling a net • Decorating the base of the game to a high quality finish • Making and testing a circuit • Incorporating a circuit into a base
Cooking and nutrition	• Chopping fruit and vegetables safely to make a smoothie • Identifying if a food is a fruit or a vegetable • Learning where and how fruits and vegetables grow	• Slicing food safely using the bridge or claw grip • Constructing a wrap that meets a design brief	• Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination • Following the instructions within a recipe	• Following a baking recipe • Cooking safely, following basic hygiene rules • Adapting a recipe	• Cutting and preparing vegetables safely • Using equipment safely, including knives, hot pans and hobs • Knowing how to avoid cross-contamination • Following a step by step method carefully to make a recipe	• Following a recipe, including using the correct quantities of each ingredient • Adapting a recipe based on research • Working to a given timescale • Working safely and hygienically with independence

Design

Make

Evaluation

Technical knowledge

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Textiles	• Cutting fabric neatly with scissors • Using joining methods to decorate a puppet • Sequencing steps for construction	• Selecting and cutting fabrics for sewing • Decorating a pouch using fabric glue or running stitch	• Following design criteria to create a cushion • Selecting and cutting fabrics with ease using fabric scissors • Sewing cross stitch to join fabric • Decorating fabric using appliqué • Completing design ideas with stuffing and sewing the edges	• Making and testing a paper template with accuracy and in keeping with the design criteria • Measuring, marking and cutting fabric using a paper template • Selecting a stitch style to join fabric, working neatly sewing small neat stitches • Incorporating fastening to a design	• Creating a 3D stuffed toy from a 2D design • Measuring, marking and cutting fabric accurately and independently • Creating strong and secure blanket stitches when joining fabric • Using applique to attach pieces of fabric decoration	• Using template pinning panels onto fabric • Marking and cutting fabric accurately, in accordance with a design • Sewing a strong running stitch, making small, neat stitches and following the edge • Tying strong knots • Decorating a waistcoat - attaching objects using thread and adding a secure fastening

Design

Make

Evaluation

Technical knowledge

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Structures	• Evaluating a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't • Suggest points for improvements	• Exploring the features of structures • Comparing the stability of different shapes • Testing the strength of own structures • Identifying the weakest part of a structure • Evaluating the strength, stiffness and stability of own structure	• Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design • Suggesting points for modification of the individual designs	• Evaluating structures made by the class • Describing what characteristics of a design and construction made it the most effective • Considering effective and ineffective designs	• Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary • Suggesting points for improvements for own bridges and those designed by others	• Improving a design plan based on peer evaluation • Testing and adapting a design to improve it as it is developed • Identifying what makes a successful structure
Food	• Tasting and evaluating different food combinations • Describing appearance, smell and taste • Suggesting information to be included on packaging	• Describing the taste, texture and smell of fruit and vegetables • Taste testing food combinations and final products • Describing the information that should be included on a label • Evaluating which grip was most effective	• Establishing and using design criteria to help test and review dishes • Describing the benefits of seasonal fruits and vegetables and the impact on the environment • Suggesting points for improvement when making a seasonal tart	• Evaluating a recipe, considering: taste, smell, texture and appearance • Describing the impact of the budget on the selection of ingredients • Evaluating and comparing a range of products • Suggesting modifications	• Identifying the nutritional differences between different products and recipes • Identifying and describing healthy benefits of food groups	• Evaluating a recipe, considering: taste, smell, texture and origin of the food group • Taste testing and scoring final products • Suggesting and writing up points of improvements in productions • Evaluating health and safety in production to minimise cross contamination

Kapow Primary™

Design

Make

Evaluation

Technical knowledge

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Mechanisms	• Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed • Reviewing the success of a product by testing it with its intended audience • Testing mechanisms, identifying what stops wheels from turning, knowing • that a wheel needs an axle in order to move	• Evaluating own designs against design criteria • Using peer feedback to modify a final design • Evaluating different designs • Testing and adapting a design	• Using the views of others to improve designs • Testing and modifying the outcome, suggesting improvements	• Evaluating the speed of a final product based on: the affect of shape on speed and the accuracy of workmanship on performance	• Evaluating the work of others and receiving feedback on own work • Suggesting points for improvement	• Evaluating the work of others and receiving feedback on own work • Applying points of improvements • Describing changes they would make/ do if they were to do the project again
Electrical systems	• N/A	• N/A	• Learning to give constructive criticism on own work and the work of others • Testing the success of a product against the original design criteria and justifying opinions	• Evaluating electrical products • Testing and evaluating the success of a final product and taking inspiration from the work of peers	• Evaluating a completed product against the original design sheet and looking at modifications that could be made to improve the reliability or aesthetics of it or to incorporate another type of electronic device, eg: buzzer	• Testing own and others finished games, identifying what went well and making suggestions for improvement

Design

Make

Evaluation

Technical knowledge

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Textiles	• Reflecting on a finished product, explaining likes and dislikes	• Troubleshooting scenarios posed by teacher • Evaluating the quality of the stitching on others' work • Discussing as a class, the success of their stitching against the success criteria • Identifying aspects of their peers' work that they particularly like and why	• Evaluating an end product and thinking of other ways in which to create similar items	• Testing and evaluating an end product against the original design criteria • Deciding how many of the criteria should be met for the product to be considered successful • Suggesting modifications for improvement	• Testing and evaluating an end product and giving point for further improvements	• Evaluating work continually as it is created

Design

Make

Evaluation

Technical knowledge

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Food	• Understanding the difference between fruits and vegetables • Describing and grouping fruits by texture and taste	• Understanding what makes a balanced diet • Knowing where to find the nutritional information on packaging • Knowing the five food groups	• Learning that climate affects food growth • Working with cooking equipment safely and hygienically • Learning that imported foods travel from far away and this can negatively impact the environment • Learning that vegetables and fruit grow in certain seasons • Learning that each fruit and vegetable gives us nutritional benefits • Learning to use, store and clean a knife safely	• Understanding the impact of the cost and importance of budgeting while planning ingredients for biscuits • Understanding the environmental impact on future product and cost of production	• Understanding where food comes from - learning that beef is from cattle and how beef is reared and processed • Understanding what constitutes a balanced diet • Learning to adapt a recipe to make it healthier • Comparing two adapted recipes using a nutritional calculator and then identifying the healthier option	• Learning how to research a recipe by ingredient • Recording the relevant ingredients and equipment needed for a recipe • Understanding the combinations of food that will complement one another • Understanding where food comes from, describing the process of 'Farm to Fork' for a given ingredient

Kapow Primary™

Design

Make

Evaluation

Technical knowledge

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Mechanisms	• Learning that levers and sliders are mechanisms and can make things move • Identifying whether a mechanism • is a lever or slider and determining what movement the mechanism will make • Using the vocabulary: up, down, left, right, vertical and horizontal to describe movement • Identifying what mechanism makes a toy or vehicle roll forwards • Learning that for a wheel to move it must be attached to an axle	• Learning that mechanisms are a collection of moving parts that work together in a machine • Learning that there is an input and output in a mechanism • Identifying mechanisms in everyday objects • Learning that a lever is something that turns on a pivot • Learning that a linkage is a system of levers that are connected by pivots • Exploring wheel mechanisms • Learning how axels help wheels to move a vehicle	• Understanding how pneumatic systems work • Learning that mechanisms are a system of parts that work together to create motion • Understanding that pneumatic systems can be used as part of a mechanism • Learning that pneumatic systems force air over a distance to create movement	• Learning that products change and evolve over time • Learning that all moving things have kinetic energy • Understanding that kinetic energy is the energy that something (object person) has by being in motion	• Knowing that an input is the motion used to start a mechanism • Knowing that output is the motion that happens as a result of starting the input • Knowing that mechanisms control movement • Describing mechanisms that can be used to change one kind of motion into another	• Using a bench hook to saw safely and effectively • Exploring cams, learning that different shaped cams produce different follower movements • Exploring types of motions and direction of a motion

Kapow Primary™

Design

Make

Evaluation

Technical knowledge

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Structures	• Describing the purpose of structures, including windmills • Learning how to turn 2D nets into 3D structures • Learning that the shape of materials can be changed to improve the strength and stiffness of structures • Understanding that cylinders are a strong type of structure that are often used for windmills and lighthouses • Understanding that windmill turbines use wind to turn and make the machines inside work • Understanding that axles are used in structures and mechanisms to make parts turn in a circle • Developing awareness of different structures for different purposes	• Identifying natural and man-made structures • Identifying when a structure is more or less stable than another • Knowing that shapes and structures with wide, flat bases or legs are the most stable • Understanding that the shape of a structure affects its strength • Using the vocabulary: strength, stiffness and stability • Knowing that materials can be manipulated to improve strength and stiffness • Building a strong and stiff structure by folding paper	• Identifying features of a castle • Identifying suitable materials to be selected and used for a castle, considering weight, compression, tension • Extending the knowledge of wide and flat based objects are more stable • Understanding the terminology of strut, tie, span, beam • Understanding the difference between frame and shell structure	• Learning what pavilions are and their purpose • Building on prior knowledge of net structures and broadening knowledge of frame structures • Learning that architects consider light, shadow and patterns when designing • Implementing frame and shell structure knowledge • Considering effective and ineffective designs	• Exploring how to create a strong beam • Identifying arch and beam bridges and understanding the terms: compression and tension • Identifying stronger and weaker structures • Finding different ways to reinforce structures • Understanding how triangles can be used to reinforce bridges • Articulating the difference between beam, arch, truss and suspension bridges	• Knowing that structures can be strengthened by manipulating materials and shapes • Identifying the shell structure in everyday life (cars, aeroplanes, tins, cans) • Understanding man made and natural structures

Design

Make

Evaluation

Technical knowledge

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Textiles	• Learning different ways in which to join fabrics together: pinning, stapling, gluing	• Joining items using fabric glue or stitching • Identifying benefits of these techniques • Threading a needle • Sewing running stitch, with evenly spaced, neat, even stitches to join fabric • Neatly pinning and cutting fabric using a template	• Threading needles with greater independence • Tying knots with greater independence • Sewing cross stitch and appliqué • Understanding the need to count the thread on a piece of even weave fabric in each direction to create uniform size and appearance • Understanding that fabrics can be layered for affect	• Understanding that there are different types of fastenings and what they are • Articulating the benefits and disadvantages of different fastening types	• Learning to sew blanket stitch to join fabric • Applying blanket stitch so the space between the stitches are even and regular • Threading needles independently	• Learning different decorative stitches • Application and outcome of the individual technique • Sewing accurately with even regularity of stiches

Design

Make

Evaluation

Technical knowledge

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Electrical systems	• N/A	• N/A	• Understanding what static electricity is and how it moves objects through attraction or repulsion • Generating static electricity independently • Using static electricity to make objects move in a desired way	• Learning how electrical items work • Identifying electrical products • Learning what electrical conductors and insulators are • Understanding that a battery contains stored electricity and can be used to power products • Identifying the features of a torch • Understanding how a torch works • Articulating the positives and negatives about different torches	• Learning the key components used to create a functioning circuit • Learning that graphite is a conductor and can be used as part of a circuit • Learning the difference between series and parallel circuits • Understanding that breaks in a circuit will stop it from working	• Understanding how electromagnetic motors work • Learning that batteries contain acid, which can be dangerous if they leak • Learning that when electricity enters a magnetic field it can make a motor