Barrow CEVC Primary School

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DESIGN & TECHNOLOGY IMPLEMENTATION

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IMPLEMENTATION

Design and Technology - Implementation

Implementation

The implementation of the curriculum relates to how the learning is going to be delivered across your school, taking the intent of the learning, and translating it into a progressive and effective curriculum.

When using a scheme, such as Kapow Primary, the majority of this aspect is taken care of.

The Design and technology National curriculum outlines the three main stages of the design process: design, make and evaluate. Each stage of the design process is underpinned by technical knowledge which encompasses the contextual, historical, and technical understanding required for each strand. Cooking and nutrition* has a separate section, with a focus on specific principles, skills and techniques in food, including where food comes from, diet and seasonality.

The National curriculum organises the Design and technology attainment targets under five subheadings or strands:

- Design
- Make
- Evaluate
- Technical knowledge
- Cooking and nutrition*

Kapow Primary's Design and technology scheme has a clear progression of skills and knowledge within these five strands across each year group.

Our Curriculum overview shows which of our units cover each of the National curriculum attainment targets as well as each of the five strands.

Our Progression of skills shows the skills that are taught within each year group and how these skills develop to ensure that attainment targets are securely met by the end of each key stage.

Through Kapow Primary's Design and technology scheme, pupils respond to design briefs and scenarios that require consideration of the needs of others, developing their skills in six key areas:

- Mechanisms
- Structures
- Textiles
- Cooking and nutrition (Food)
- Electrical systems (KS2) *and*
- Digital world (KS2)

Each of our key areas follows the design process (design, make and evaluate) and has a particular theme and focus from the technical knowledge or cooking and nutrition section of the curriculum. The Kapow Primary scheme is a spiral curriculum, with key areas revisited again and again with increasing complexity, allowing pupils to revisit and build on their previous learning.

Lessons incorporate a range of teaching strategies from independent tasks, paired and group work including practical hands-on, computer-based and inventive tasks. This variety means that lessons are engaging and appeal to those with a variety of learning styles. Differentiated guidance is available for every lesson to ensure that lessons can be accessed by all pupils and opportunities to stretch pupils' learning are available when required. Knowledge organisers for each unit support pupils in building a foundation of factual knowledge by encouraging recall of key facts and vocabulary.

Strong subject knowledge is vital for staff to be able to deliver a highly effective and robust Design and technology curriculum. Each unit of lessons includes multiple teacher videos to develop subject knowledge and support ongoing CPD. Kapow has been created with the understanding that many teachers do not feel confident delivering the full Design and technology curriculum and every effort has been made to ensure that they feel supported to deliver lessons of a high standard that ensure pupil progression.

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Design and Technology - Implementation

Approach – Knowledge

At Barrow Primary School, Design and Technology is taught across each year group in modules that enable pupils develop in creativity, independence, judgement and self-reflection. Each module aims to activate and build upon prior learning, including EYFS, to ensure better cognition and retention.

As a school we look to master practical skills relating to Design and Technology which involves developing the skills needed to make high quality products. Through this a child will design, make, evaluate and improve their creations allowing children to develop an understanding of design thinking and seeing their designs as a process. We also want children to take inspiration from design throughout history this will involves appreciating the design process that has influenced the products we use in everyday life.

D&T Curriculum Overview

Kapow offers full coverage of the KS1 and KS2 Design & Technology curriculum and we have categorised our content into five areas:

- Structures
- Mechanisms
- Electrical Systems
- Cooking and Nutrition
- Textiles

Aside from Electrical Systems, which is KS2 only, each of these acts as the focus for a topic within each year group:

	Cooking and Nutrition	Mechanisms	Structures	Textiles	Electrical Systems
Y1	Fruit and Vegetable Smoothie	Moving Storybook: Sliders Wheels and Axles	Windmills	Puppets	
Y2	A Balanced Diet	Moving Monsters Ferris Wheels	Baby Bear's Chair	Pouches	
Y3	Eating Seasonally	Pneumatic Toys	Castles	Cushions	Static Electricity
Y4	Adapting a Recipe	Slingshot Cars	Pavilions	Fastenings	Torches
Y5	What Could Be Healthier?	Pop-up Books	Bridges	Stuffed Toys	Electric Greetings Cards
Y6	Come Dine With Me	Automata Toys	Playgrounds	Waistcoats	Steady Hand Games

There are then four strands that run through each topic:

Design | Make | Evaluate | Technical Knowledge

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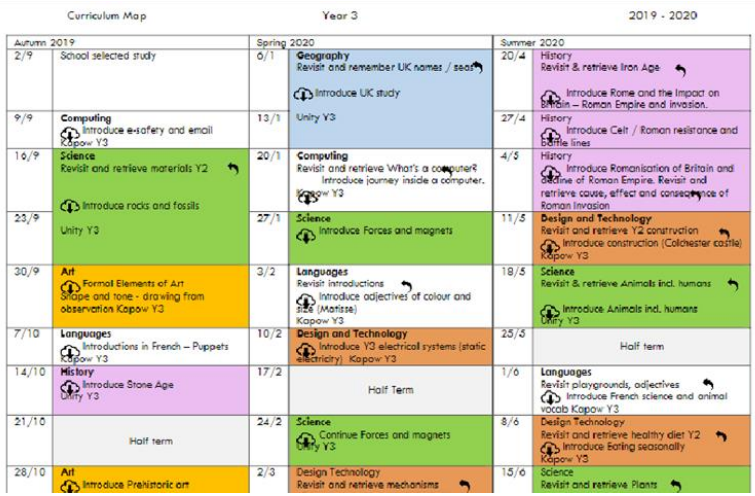
Design and Technology - Implementation

Planning

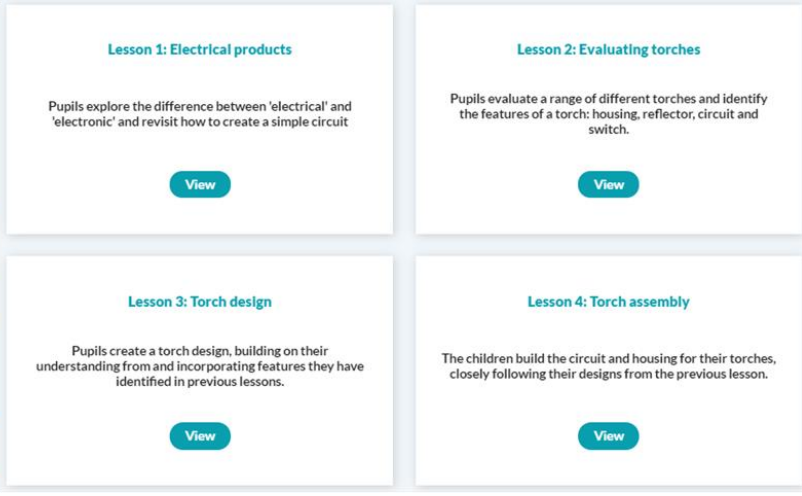
All modules have a sequenced overview outlining recommended number of sessions, key concepts, knowledge and vocabulary to be taught. Teachers use this overview to plan individual sessions approximately 45-50 minutes in length. All planning is produced on using or Discovery Planning template which incorporates cooperative learning techniques, key vocabulary, core concepts and a class profile to enable all teaching staff to effectively plan and support the needs of all pupils in the classroom.



Curriculum Map — Year 3 — 2019 - 2020

Autumn 2019		Spring 2020		Summer 2020	
2/9	School selected study	6/1	**Geography** Revisit and remember UK names / seas. Introduce UK study	20/4	History Revisit & retrieve Iron Age. Introduce Rome and the Impact on Britain – Roman Empire and invasion.
9/9	**Computing** Introduce e-safety and email Kapow Y3	13/1	Unity Y3	27/4	History Introduce Celt / Roman resistance and battle lines
16/9	**Science** Revisit and retrieve materials Y2. Introduce rocks and fossils	20/1	**Computing** Revisit and retrieve What's a computer? Introduce journey inside a computer. Kapow Y3	4/5	History Introduce Romanisation of Britain and decline of Roman Empire. Revisit and retrieve cause, effect and consequence of Roman invasion
23/9	Unity Y3	27/1	**Science** Introduce Forces and magnets	11/5	**Design and Technology** Revisit and retrieve Y2 construction. Introduce construction (Colchester castle) Kapow Y3
30/9	**Art** Formal Elements of Art Shape and tone - drawing from observation Kapow Y3	3/2	**Languages** Revisit introductions. Introduce adjectives of colour and size (Matisse) Kapow Y3	18/5	**Science** Revisit & retrieve Animals incl. humans. Introduce Animals incl. humans Unity Y3
7/10	**Languages** Introductions in French – Puppets Kapow Y3	10/2	**Design and Technology** Introduce Y3 electrical systems (static electricity) Kapow Y3	25/5	Half term
14/10	**History** Introduce Stone Age Unity Y3	17/2	Half Term	1/6	**Languages** Revisit playgrounds, adjectives. Introduce French science and animal vocab Kapow Y3
21/10	Half term	24/2	**Science** Continue Forces and magnets Unity Y3	8/6	Design Technology Revisit and retrieve healthy diet Y2. Introduce Eating seasonally Kapow Y3
28/10	**Art** Introduce PreHistoric art	2/3	Design Technology Revisit and retrieve mechanisms	15/6	Science Revisit and retrieve Plants

Example of Year 3 Curriculum Map.



Lesson 1: Electrical products

Pupils explore the difference between 'electrical' and 'electronic' and revisit how to create a simple circuit

View

Lesson 2: Evaluating torches

Pupils evaluate a range of different torches and identify the features of a torch: housing, reflector, circuit and switch.

View

Lesson 3: Torch design

Pupils create a torch design, building on their understanding from and incorporating features they have identified in previous lessons.

View

Lesson 4: Torch assembly

The children build the circuit and housing for their torches, closely following their designs from the previous lesson.

View

Example of a Year 4 lesson structure.

Example of Year 3 Medium Term Planning sheet excerpt with Design and Technology included.

			Revisit Yr2: What are human features?	Children to explore the environment and list the human and physical features they can see. Begin to use a compass to explain the locality of the features.	
	Science	Non-chronological Reports (Rocks and Fossils)	To test a rock to identify it as either limestone or chalk.	Children explore a controlled variable (acid) and an independent variable (type of rock) and a dependent variable (reaction of rock). They come up with an experiment to test a rock to identify it as either limestone or chalk. They carry out the experiment in a fair way and then make observations using their senses (look and listen) during the experiment. They answer questions about the results.	**Controlled, Independent and Dependent variable**
	DT		To know how to sew cross-stitch and applique.	Children will learn about cross-stitch and applique and will attempt this independently.	**Applique, cross stitch**
	Music		**Writing Lyrics.** To write the lyrics for a ballad.	Children write lyrics to tell a story: including a class chorus and a verse written as a group which focusses on specific parts of the animated story.	**Compose Happy**
	PE		**Gymnastics – Rhythmic Gymnastics.** To develop flexibility, strength, technique, control and balance. To use running, jumping, throwing and catching in isolation and in combination.	Children to experiment with a hoop (rolling, chasing, skipping, catching, static movement). Children to work in partners to create a short sequence, rolling the hoop to one another whilst performing a turn or jump waiting for the hoop to return. Recap skills using ball from last week. Can children create a short routine (including a throw and catch, 2shape and hold positions, a roll and retrieve).	
			Dance – Tornadoes! To show awareness of others when moving.	Children create considered movements to represent the different properties of a tornado. They work co-operatively with a group to create a dance motif where each dancer is a tornado. They describe what makes a good dance motif.	**Stimuli, motif**

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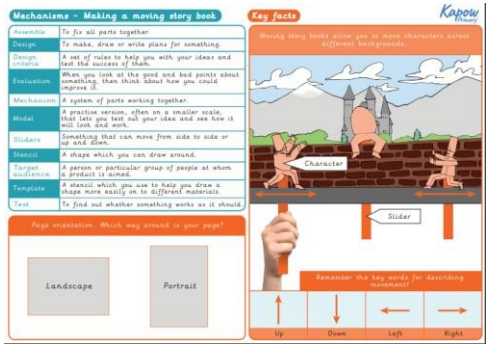
Knowledge Organisers

Accompanying each module is a Knowledge Organiser which contains key vocabulary, information and concepts which all pupils are expected to understand and retain. Knowledge notes are the elaboration and detail to help pupils acquire the content of each module. They support vocabulary and concept acquisition through a well-structured sequence that is cumulative. Each Knowledge Note contains key vocabulary and key facts for the focus module.



Year 1 Knowledge Organiser

Year 6 Knowledge Organiser

Year 3 Knowledge Organiser

Visual summaries of the key vocabulary and facts for each of the year groups Design & Technology topics. These are on the website and are suitable for printing on A4 or larger sizes for classroom display

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Design and Technology Vocabulary

Year 2

Food: A balanced diet

alternative, diet, balanced diet, evaluation, expensive, healthy, ingredients, nutrients, packaging, refrigerator, sugar, substitute

Mechanisms: Making a moving monster

evaluation, input, lever, linear motion, linkage, mechanical, mechanism, motion, oscillating motion, output, pivot, reciprocating motion, rotary motion, survey

Structures: Baby Bear's chair

function, man-made, mould, natural, stable, stiff, strong, structure, test, weak

Textiles: Pouches

accurate, fabric, knot, pouch, running-stitch, sew, shape, stencil, template, thimble

Mechanisms: Fairground wheel

axle, decorate, evaluation, ferris wheel, mechanism, stable, strong, test, waterproof, weak

Vocabulary

Vocabulary forms a key part of our wider curriculum. Subject specific Tier 2 and Tier 3 words are incorporated in each module and pupils are encouraged to develop their own 'Vital Vocabulary' lists along with dual coding to expand their science vocabulary repertoire.

Oracy

When discussing their findings or presenting information, pupils are encouraged to speak using full sentences and incorporating the key scientific vocabulary. Pupils are supported to develop their oracy skills across the school with the use of 'Ask me about…' stickers, where adults and children can ask each other about aspects of their learning.

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Resources

Accompanying each module is a list of resources needed to teach and implement Design Technology across the year groups for the whole of the year needed. They are contained on an excel spreadsheet under year groups and are a comprehensive and detailed list including quantities needed per child, per year group.

List of required resources

Green apples	
Green grapes	
Mangos	
Paper plates	
Paper/hand towels	

Required resources for Design and technology

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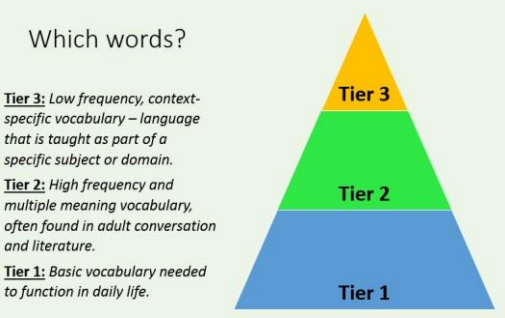
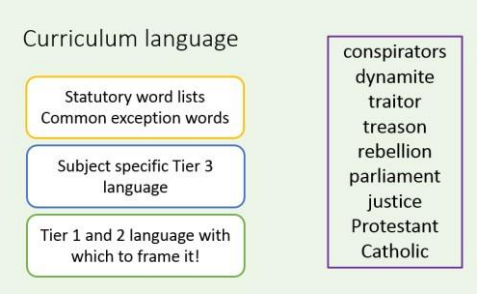
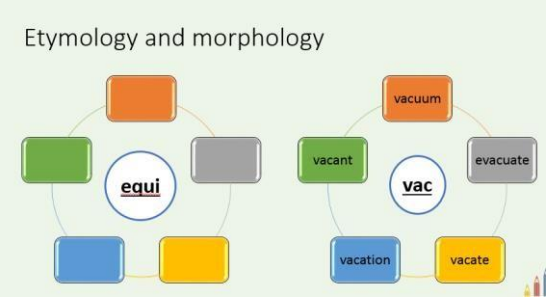
Continuous Professional Development

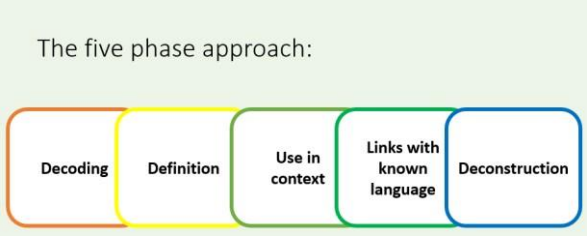
All staff have undergone CPD in Cognitive Load Theory, Spaced Practice Retrieval Theory and planning the wider curriculum which has supported the development of a modular wider curriculum.

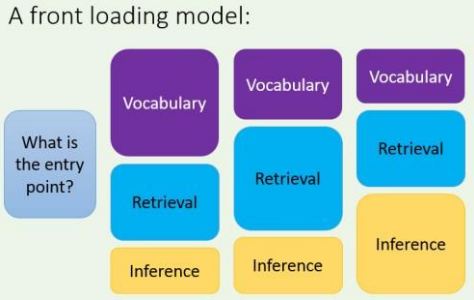
In addition, staff have been trained in the Theory of Reading which emphasises the importance of teaching reading across all subjects and how to teach vocabulary – including etymology and morphology.











Teachers are encouraged to develop their subject knowledge by accessing resources in school and online.

Further training is scheduled to support teachers to plan and facilitate

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A spiral curriculum

The scheme of work has been designed as a spiral curriculum with the following key principles in mind:

- ✓ **Cyclical**: Pupils return to the key strands again and again during their time in primary school.
- ✓ **Increasing depth**: Each time the key strand is revisited it is covered with greater complexity.
- ✓ **Prior knowledge**: Upon returning to each key strand, prior knowledge is utilised so pupils can build upon previous foundations, rather than starting again.

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Design Technology Progression – Design

Kapow Primary

Strands:		Key stage 1		Key stage 2			
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design Make Evaluation Technical knowledge	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 and/or decorating a castle tower on CAD software	• 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/ Mechanical systems	• 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	•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 • Understanding and drawing cross-sectional diagrams to show the inner-workings of the automata

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Design Technology Progression – Design

Kapow Primary	Strands:	Key stage 1		Key stage 2			
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design Make Evaluation Technical knowledge	Electrical systems **(KS2 *only*)**	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 copper track circuit and components • Creating a labelled circuit diagram showing positive and negative parts in relation to the LED and the battery • Writing design criteria for an electronic greeting card • Compiling a moodboard relevant to my chosen theme, purpose and recipient	• 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 • Understanding the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'
	Cooking and nutrition	• Designing smoothie carton packaging by-hand or on ICT software	• 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

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Design Technology Progression – Design

Kapow Primary	Strands:	Key stage 1		Key stage 2			
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design Make Evaluation Technical knowledge	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 the proportions of individual components	• Designing a waistcoat in accordance to specification linked to set of design criteria to fit a specific theme • Annotating designs
	Digital world **(KS2 *only*)**	N/A	N/A	• Problem solving by suggesting potential features on a Micro: bit and justifying my ideas • Developing design ideas for a technology pouch • Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge	• Writing design criteria for a programmed timer (Micro:bit) • Exploring different mindfulness strategies • Applying the results of my research to further inform my design criteria • Developing a prototype case for my mindful moment timer • Using and manipulating shapes and clipart, using computer-aided design (CAD), to produce a logo • Following a list of design requirements	• Researching (books, internet) for a particular (user's) animal's needs • Developing design criteria based on research • Generating multiple housing ideas using building bricks • Understanding what a virtual model is and the pros and cons of traditional and CAD modelling • Placing and manoeuvring 3D objects, using CAD • Changing the properties of, or combine one or more 3D objects, using CAD	• Writing a design brief from information submitted by a client • Developing design criteria to fulfil the client's request • Considering and suggesting additional functions for my navigation tool • Developing a product idea through annotated sketches • Placing and manoeuvring 3D objects, using CAD • Changing the properties of, or combine one or more 3D objects, using CAD

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Design Technology Progression – Make

Kapow Primary	Strands:	Key stage 1		Key stage 2			
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design	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 • Explaining why selecting appropriating materials is an important part of the design process • Understanding basic wood functional properties	• 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
Make							
Evaluation							
Technical knowledge							

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Design Technology Progression – Make

Kapow Primary	Strands:	Key stage 1		Key stage 2			
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design	Mechanisms/ Mechanical systems	• 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
Make							
Evaluation							
Technical knowledge							

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Design Technology Progression – Make

Kapow Primary	Strands:	Key stage 1		Key stage 2			
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design Make Evaluation Technical knowledge	Electrical systems **(KS2 *only*)**	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 functional series circuit • Creating an electronics greeting card, referring to a design criteria • Mapping out where different components of the circuit will go	• Constructing a stable base for a 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

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Design Technology Progression – Make

Kapow Primary	Strands:	Key stage 1		Key stage 2			
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design Make Evaluation Technical knowledge	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 a template when 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
	Digital world **(KS2 *only*)**	N/A	N/A	• Using a template when cutting and assembling the pouch • Following a list of design requirements • Selecting and using the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch • Applying functional features such as using foam to create soft buttons	• Developing a prototype case for my mindful moment timer • Creating a 3D structure using a net	• Understanding the functional and aesthetic properties of plastics	• Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo) • Explaining material choices and why they were chosen as part of a product concept

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Design Technology Progression – Evaluation

Kapow Primary	Strands:	Key stage 1		Key stage 2			
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design Make Evaluation Technical knowledge	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
	Cooking and nutrition	• 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

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Design Technology Progression – Evaluation

Kapow Primary	Strands:	Key stage 1		Key stage 2			
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design Make Evaluation Technical knowledge	Mechanisms/ Mechanical systems	• 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 • Understanding the purpose of exploded-diagrams through the eyes of a designer and their client	• Evaluating the speed of a final product based on: the effect 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 **(KS2 *only*)**	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 peer's product against design criteria and suggesting modifications that could be made to improve the reliability or aesthetics of it or to incorporate another type of circuit component • Stating what Sir Rowland Hill invented and why it was important for greeting cards • Analysing and evaluating a range of existing greeting cards.	• Testing own and others finished games, identifying what went well and making suggestions for improvement • Gathering images and information about existing children's toys • Analysing a selection of existing children's toys

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Design Technology Progression – Evaluation

Kapow Primary	Strands:	Key stage 1		Key stage 2			
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design Make Evaluation Technical knowledge	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
	Digital world **(KS2 *only*)**	N/A	N/A	• Analysing and evaluating an existing product • Identifying the key features of a pouch	• Investigating and analysing a range of timers by identifying and comparing their advantages and disadvantages • Evaluating my micro:bit program against points on my design criteria and amending them to include any changes I made • Documenting and evaluating my project • Understanding what a logo is and why they are important in the world of design and business	• Stating an event or fact from the last 100 years of plastic history • Explaining how plastic is affecting planet Earth and suggesting ways to make more sustainable choices	• Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool • Developing an awareness of sustainable design • Identifying key industries that utilise 3D CAD modelling and explain why • Describing how the product concept fits the client's request and how it will benefit the customers

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Design Technology Progression – Technical Knowledge

Kapow Primary

Strands:		Key stage 1		Key stage 2			
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design Make Evaluation Technical knowledge	Cooking and nutrition	• 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

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Design Technology Progression – Technical Knowledge

Kapow Primary

	Strands:	Key stage 1		Key stage 2			
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design Make Evaluation Technical knowledge	Mechanisms/ Mechanical systems	• 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

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Design Technology Progression – Technical Knowledge

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Kapow Primary™

Strands:		Key stage 1		Key stage 2			
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design Make Evaluation Technical knowledge	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

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Design Technology Progression – Technical Knowledge

Kapow Primary	Strands:	Key stage 1		Key stage 2			
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design	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 evenweave 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 stitches
Make							
Evaluation							
Technical knowledge							

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Design Technology Progression – Technical Knowledge

Kapow Primary	Strands:	Key stage 1		Key stage 2			
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design	Electrical systems **(KS2 *only*)**	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 copper is a conductor and can be used as part of a circuit • Understanding that breaks in a circuit will stop it from working • Explaining how a series circuit will work in my card • Identifying the negative and positive leg of an LED • Drawing a series circuit diagram and symbols	• Learning that batteries contain acid, which can be dangerous if they leak • Identifying and naming the circuit components in a steady hand game
Make							
Evaluation							
Technical knowledge							

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Design Technology Progression – Technical Knowledge

Kapow Primary	Strands:	Key stage 1		Key stage 2			
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design Make Evaluation Technical knowledge	Digital world **(KS2 *only*)**	N/A	N/A	• Identifying key product developments that occurred as a result of the digital revolution • Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm • Understanding what a loop is in programming • Explaining the basic functionality of my eCharm program • Understanding what is meant by 'point of sale display'	• Writing design criteria for a programmed timer (Micro:bit) • Programming a micro:bit in the Microsoft micro:bit editor, to time a set number of seconds/minutes upon button press • Testing my program for bugs (errors in the code) • Finding and fixing the bugs (debug) in my code	• Describing key developments in thermometer history • Programming to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range • Explaining key functions in my program (audible alert, visuals) • Explaining how my product would be useful for an animal carer including programmed features	• Programming an N,E, S,W cardinal compass • Explaining the key functions in my program, including any additions • Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool • Explaining the key functions and features of my navigation tool to the client as part of a product concept pitch • Demonstrating a functional program as part of a product concept

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Assessment

Computing is assessed at the end of each unit (half termly). Each class has a whole-class evidence book which gives a selection of examples of pupils work. Pupils work is also saved on a shared drive for individual classes (work-in-progress).

Teachers will assess each child against our assessment criteria (below) using our whole-school assessment system 'Insight'.

The children are scored on a scale from 0-3
0- Taught but not understood
1- Some evidence but not yet secure
2- Objective secure
3- Working at Greater Depth

Y1 Objectives
☐ Food, Fruit & Vegetables
☐ Mechanisms: Making a Moving Story Book
☐ Structures: Constructing a Windmill
☐ Textiles: Puppets
☐ Mechanisams: Wheels & Axles

Y2 Objectives
☐ Mechanisms: Fairground Wheel
☐ Food: A Balanced Diet
☐ Mechanisms: Making a Moving Monster
☐ Structures: Baby Bear's Chair
☐ Textiles: Pouches

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Assessment continued...

Y3 Objectives

- [ ] Textiles: Cushions
- [ ] Electrical Systems: Static Electricity
- [ ] Mechanical Systems: Pneumatic Toys
- [ ] Digital World: Electronic Charm
- [ ] Food: Eating Seasonally
- [ ] Structures: Constructing a Castle

Y4 Objectives

- [ ] Electrical Systems: Torches
- [ ] Mechanical Systems: Making a Slingshot Car
- [ ] Digital World: Mindful Moments Timer
- [ ] Food: Adapting a Receipe
- [ ] Structures: Pavillions
- [ ] Textiles: Fastenings

Y5 Objectives

- [ ] Mechanical Systems: Pop-up Books
- [ ] Digital World: Monitoring Devices
- [ ] Food: What Could Be Healthier
- [ ] Structures: Bridges
- [ ] Textiles: Stuffed Toys
- [ ] Electrical Systems: Electronic Greeting Cards

Y6 Objectives

- [ ] Digital World: Navigating the World
- [ ] Food: Come Dine With Me
- [ ] Structures: Playgrounds
- [ ] Textiles: Waistcoats
- [ ] Electrical Systems: Steady Hand Game
- [ ] Mechanical Systems: Au
- [ ] Mechanical Systems: Automata Toys