Design Technology at Beechwood Primary School

By the end of studying DT at Beechwood Primary School, children will be able to talk about the following themes which they cover through the Kapow Primary Scheme of work:

- Cooking and nutrition (Where food comes from, balanced diet, preparation and cooking skills. Kitchen hygiene and safety. Following recipes)
- Mechanisms/Mechanical systems (Mimic natural movements using mechanisms such as cams, followers, levers and sliders.)
- Structures (Material functional and aesthetic properties, strength and stability, stiffen and reinforce structures)
- Textiles (Fastening, sewing, decorative and functional fabric techniques including cross stitch, blanket stitch and appliqué.)
- Electrical Systems (Operational series circuits, circuit components, circuit diagrams and symbols, combined to create various electrical products.)
- Digital World (Program products to monitor and control, develop designs and virtual models using 2D and 3D CAD software.)

Key Themes	Year Group Covered						
	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Cooking and nutrition							
Mechanisms/mechanical systems							
Structures							
Textiles							
Electrical systems							
Digital world							

Units and End Points			
EYFS	**Structures: Junk modelling** *Explore and learn about various types of permanent and temporary join. They are encouraged to tinker using a combination of materials and joining techniques in the junk modelling area..*	**Cooking and nutrition; soup** *Explore the differences between fruits and vegetables using their senses (taste, texture, smell etc.). They listen to the story 'The best pumpkin soup' and discuss the key ingredients the characters used before developing a class-based vegetable soup recipe..*	**Textiles; Bookmarks** *Develop and practise threading and weaving techniques using various materials and objects. They look at the history of the bookmark from Victorian times versus modern-day styles. The pupils apply their knowledge and skills to design and sew their own bookmarks..*
	Structures; Boats *Explore what is meant by 'waterproof', 'floating' and 'sinking', then experiment and make predictions with various materials to carry out a series of tests. They learn about the different features of boats and ships before investigating their shape and structures to build their own.*		**Seasonal Projects** *A series of seasonal projects to choose from to deliver across the year – covering Autumn, Christmas, Easter, Spring and Summer.*
Year 1	**Mechanisms; making a moving story book** *To* *know that a mechanism is the parts of an object that move together.* *To know that a slider mechanism moves an object from side to side.*	**Textiles; Puppets** *To know that 'joining technique' means connecting two pieces of material together.* *To know that there are various temporary methods of joining fabric by using staples, glue or pins.*	**Mechanisms; Wheels and axles** *To know that wheels need to be round to rotate and move.* *To understand that for a wheel to move it must be attached to a rotating axle.* *To know that an axle moves within an axle holder which is fixed to the vehicle or toy.*

	To know that a slider mechanism has a slider, slots, guides and an object. *To know that bridges and guides are bits of card that purposefully restrict the movement of the slider.*	*To understand that different techniques for joining materials can be used for different purposes.* *To understand that a template (or fabric pattern) is used to cut out the same shape multiple times.* *To know that drawing a design idea is useful to see how an idea will look.*	*To know that the frame of a vehicle (chassis) needs to be balanced.* *To know some real-life items that use wheels.*
	Cooking and nutrition; Fruit and vegetables *To understand the difference between fruits and vegetables.* *To understand that some foods typically known as vegetables are actually fruits (e.g. cucumber).* *To know that a blender is a machine which mixes ingredients together into a smooth liquid.* *To know that a fruit has seeds and a vegetable does not.* *To know that fruits grow on trees or vines.* *To know that vegetables can grow either above or below ground.* *To know that vegetables can come from different parts of the plant.*		**Structures; Constructing a windmill.** *To understand that the shape of materials can be changed to improve the strength and stiffness of structures.* *To understand that cylinders are a strong type of structure (and, therefore, they are the main shape used for windmills and lighthouses).* *To understand that axles are used in structures and mechanisms to make parts turn in a circle.* *To begin to understand that different structures are used for different purposes.* *To know that a structure is something that has been made and put together.*

Year 2	**Mechanisms; Fairground wheel** *To know that different materials have different properties and are therefore suitable for different uses.*	**Mechanisms; Making a moving monster** *To know that mechanisms are a collection of moving parts that work*	**Textiles; Pouches** *To know that sewing is a method of joining fabric.*

	To know the features of a Ferris wheel include the wheel, frame, pods, a base, an axle and an axle holder. *To know that it is important to test my design as I go along so that I can solve any problems that may occur.*	*together as a machine to produce movement.* *To know that there is always an input and an output in a mechanism.* *To know that an input is the energy that is used to start something working.* *To know that an output is the movement that happens as a result of the input.* *To know that a lever is something that turns on a pivot.* *To know that a linkage mechanism is made up of a series of levers.*	*To know that different stitches can be used when sewing.* *To understand the importance of tying a knot after sewing the final stitch.* *To know that a thimble can be used to protect my fingers when sewing.*
	Cooking and nutrition; A balanced diet *To know that 'diet' means the food and drink that a person or animal usually eats.* *To understand what makes a balanced diet.* *To know where to find the nutritional information on packaging.* *To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar.* *To understand that I should eat a range of different foods from each food group, and roughly how much of each food group.* *To know that nutrients are substances in food that all living things need to make energy, grow and develop.*		**Structures; Baby bear's chair** *To know that shapes and structures with wide, flat bases or legs are the most stable.* *To understand that the shape of a structure affects its strength.* *To know that materials can be manipulated to improve strength and stiffness.* *To know that a structure is something which has been formed or made from parts.* *To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move.* *To know that a 'strong' structure is one which does not break easily.*

	To know that 'ingredients' means the items in a mixture or recipe. *To know that I should only have a maximum of five teaspoons of sugar a day to stay healthy.* *To know that many food and drinks we do not expect to contain sugar do; we call these 'hidden sugars'.*		*To know that a 'stiff' structure or material is one which does not bend easily.*
Cooking and Nutrition – All cycles	**Year 3**	**Year 4**	**Year 5**
	Cooking and nutrition; Eating seasonally *To know that not all fruits and vegetables can be grown in the UK.* *To know that climate affects food growth.* *To know that vegetables and fruit grow in certain seasons.* *To know that cooking instructions are known as a 'recipe'.* *To know that imported food is food that has been brought into the country.*	**Cooking and nutrition; Adapting a recipe** *To know that the amount of an ingredient in a recipe is known as the 'quantity'.* *To know that it is important to use oven gloves when removing hot food from an oven.* *To know the following cooking techniques: sieving, creaming, rubbing method, cooling.* *To understand the importance of budgeting while planning ingredients for biscuits.*	**Cooking and nutrition; What could be healthier** *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 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.*
Year 3/4/5 Cycle A	**Structures; Pavillions** *To understand what a frame structure is.* *To know that a 'free-standing' structure is one that can stand on its own.*		**Digital World; Electronic charm** *To understand that in programming a 'loop' is code that repeats something again and again until stopped.* *To know that a Micro:bit is a pocket-sized, codeable computer.*

	To know that a pavilion is a decorative building or structure for leisure activities. *To know that cladding can be applied to structures for different effects.* *To know that aesthetics are how a product looks.*	*Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm.*
	Mechanical systems; making a pop up book *To know that mechanisms control movement.* *To understand that mechanisms 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 a design brief is a description of what I am going to design and make.* *To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.*	**Electrical Systems; Torches** *To understand that electrical conductors are materials which electricity can pass through.* *To understand that electrical insulators are materials which electricity cannot pass through.* *To know that a battery contains stored electricity that can be used to power products.* *To know that an electrical circuit must be complete for electricity to flow.* *To know that a switch can be used to complete and break an electrical circuit.*
Year 3/4/5 Cycle B	**Mechanical Systems; Pneumatic Toys** *To understand how pneumatic systems work.* *To understand that pneumatic systems can be used as part of a mechanism.* *To know that pneumatic systems operate by drawing in, releasing and compressing air.*	**Structures; Bridges** *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.*
	Digital World; Monitoring devices	**Textiles; cross stich and applique** *To know that appliqué is a way of mending or decorating a textile by applying smaller pieces of fabric.*

	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 know that when two edges of fabric have been joined together it is called a seam.* *To know that it is important to leave space on the fabric for the seam.* *To understand that some products are turned inside out after sewing so the stitching is hidden.* *To know that a fastening is something that holds two pieces of material together.* *To know that different fastening types are useful for different purposes.* *To know that creating a mock up (creating a prototype) of their design is useful for checking ideas and proportions.* *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 a simpler design to a high standard.* *To know that small, neat stitches which are pulled taught are important to ensure that the product is strong.*
Year 3/4/5 Cycle C	**Mechanical Systems; slingshot car** *To understand that all moving things have kinetic energy.* *To understand that kinetic energy is the energy that something (object/person) has by being in motion.* *To know that air resistance is the level of drag on an object as it is forced through the air.* *To understand that the shape of a moving object will affect how it moves due to air resistance.*	**Textiles; fastenings** *To know that appliqué is a way of mending or decorating a textile by applying smaller pieces of fabric.* *To know that when two edges of fabric have been joined together it is called a seam.* *To know that it is important to leave space on the fabric for the seam.*

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	Electrical Systems; doodlers *To know that, in a series circuit, electricity only flows in one direction.* *To know when there is a break in a series circuit, all components turn off.* *To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin.* *To know a motorised product is one which uses a motor to function.*		**Structures; Constructing a castle** *To understand that wide and flat based objects are more stable.* *To understand the importance of strength and stiffness in structures.* *To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse – and their purpose.* *To know that a façade is the front of a structure.* *To understand that a castle needed to be strong and stable to withstand enemy attack.*
Year 6	**Digital World; Navigating the world**	**Cooking and nutrition; Come dine with me**	**Structure; playgrounds**

	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.*	*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).*	*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.*
	Electrical systems; steady hand game *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'.*	**Mechanical systems; Automata toys** *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.* *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.*	

In addition to the above, children will also have one off theme days to support their understanding and develop their skills