

St Teresa's Catholic Primary School

Design and Technology Progression Map

Respect – Resilience – Read – Retain



'Do the little things well'



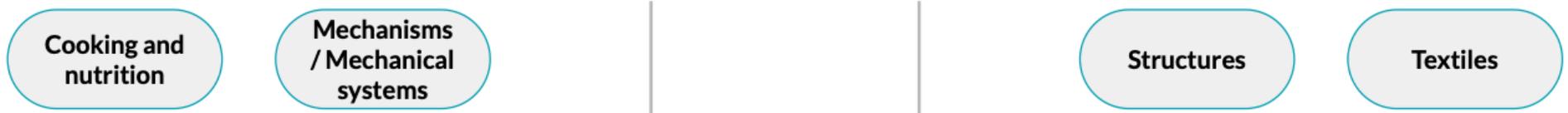
Scheme of Work

National Curriculum guidance



Kapow Primary scheme of work

Kapow primary key areas - Key stage 1 and 2



Key stage 2 only



Key Stage 1

Year A

	Autumn	Spring	Summer
Skills	<i>Mechanisms</i> Making a moving story book	<i>Cooking and Nutrition</i> Fruit and vegetables	<i>Structures</i> Constructing a windmill
Design	<ul style="list-style-type: none"> Explaining how to adapt mechanisms, using bridges or guides to control the movement. Designing a moving story book for a given audience. 	<ul style="list-style-type: none"> Designing smoothie carton packaging by-hand or on ICT software. 	<ul style="list-style-type: none"> Learning the importance of a clear design criteria. Including individual preferences and requirements in a design.
Make	<ul style="list-style-type: none"> Following a design to create moving models that use levers and sliders. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Making stable structures from card, tape and glue . Learning how to turn 2D nets into 3D structures. 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.
Evaluate	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Tasting and evaluating different food combinations. Describing appearance, smell and taste. Suggesting information to be included on packaging. 	<ul style="list-style-type: none"> 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.

Knowledge	<i>Mechanisms</i> Making a moving story book	<i>Cooking and Nutrition</i> Fruit and vegetables	<i>Structures</i> Constructing a windmill
-----------	---	--	--

<p style="text-align: center;">Technical</p>	<ul style="list-style-type: none"> • 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. • 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. 		<ul style="list-style-type: none"> • 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 (e.g. 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.
<p style="text-align: center;">Additional</p>	<ul style="list-style-type: none"> • To know that in Design and technology we call a plan a 'design'. 	<ul style="list-style-type: none"> • Understanding 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 (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber). 	<ul style="list-style-type: none"> • To know that a client is the person I am designing for. • To know that design criteria is a list of points to ensure the product meets the clients needs and wants. • To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity. • To know that windmill turbines use wind to turn and make the machines inside work. • To know that a windmill is a structure with sails that are moved by the wind. • To know the three main parts of a windmill are the turbine, axle and structure.
<p style="text-align: center;">End Point</p>	<p>To a design to create moving models that use levers and sliders.</p>	<p>To identify if a food is a fruit or a vegetable.</p> <p>To chop fruit and vegetables safely.</p>	<p>To make a stable structure.</p>

Key Stage 1

Year B

	Autumn	Spring	Summer
Skills	<i>Structures</i> Constructing a windmill	<i>Mechanisms</i> Making a moving monster	<i>Textiles</i> Puppets
Design	<ul style="list-style-type: none"> • Learning the importance of a clear design criteria. • Including individual preferences and requirements in a design. 	<ul style="list-style-type: none"> • Selecting a suitable linkage system to produce the desired motion. • Designing a wheel. 	<ul style="list-style-type: none"> • Using a template to create a design for a puppet.
Make	<p>Making stable structures from card, tape and glue .</p> <ul style="list-style-type: none"> • Learning how to turn 2D nets into 3D structures. • 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. 	<ul style="list-style-type: none"> • Selecting materials according to their characteristics. • Following a design brief. 	<ul style="list-style-type: none"> • Cutting fabric neatly with scissors. • Using joining methods to decorate a puppet. • Sequencing the steps taken during construction.
Evaluate	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Evaluating different designs. • Testing and adapting a design. 	<ul style="list-style-type: none"> • Reflecting on a finished product, explaining likes and dislikes.

Knowledge	Structures Constructing a windmill	Mechanisms Making a moving monster	Textiles Puppets
Technical	<ul style="list-style-type: none"> • 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 (e.g. 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. 	<ul style="list-style-type: none"> • To know that different materials have different properties and are therefore suitable for different uses. 	<ul style="list-style-type: none"> • To know that 'joining technique' means connecting two pieces of material together.
Additional	<ul style="list-style-type: none"> • To know that a client is the person I am designing for. • To know that design criteria is a list of points to ensure the product meets the clients needs and wants. • To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity. • To know that windmill turbines use wind to turn and make the machines inside work. • To know that a windmill is a structure with sails that are moved by the wind. • To know the three main parts of a windmill are the turbine, axle and structure. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • To know that there are various temporary methods of joining fabric by using staples. glue or pins. • 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.
End Point	To make a stable structure	To select and create a suitable linkage system to produce the desired motion.	To cut fabric neatly with scissors. To use joining methods to decorate.

Lower Key Stage 2

Year A

	Autumn	Spring	Summer
Skills	<i>Mechanical Systems</i> Pneumatic toys	<i>Cooking and Nutrition</i> Adapting a recipe	<i>Textiles</i> Cushions
Design	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Designing a biscuit within a given budget, drawing upon previous taste testing judgements. 	<ul style="list-style-type: none"> • Designing and making a template from an existing cushion and applying individual design criteria.
Make	<ul style="list-style-type: none"> • 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 and weaving. 	<ul style="list-style-type: none"> • Following a baking recipe, from start to finish, including the preparation of ingredients. • Cooking safely, following basic hygiene rules. • Adapting a recipe to improve it or change it to meet new criteria (e.g. from savoury to sweet). 	<ul style="list-style-type: none"> • Following design criteria to create a cushion. • Selecting and cutting fabrics with ease using fabric scissors. • Threading needles with greater independence. • Tying knots with greater independence. • Sewing cross stitch to join fabric. • Decorating fabric using appliqué. • Completing design ideas with stuffing and sewing the edges (Cushions) or embellishing the collars based on design ideas (Egyptian collars).

<p>Evaluate</p>	<ul style="list-style-type: none">• 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.	<ul style="list-style-type: none">• 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 food products.• Suggesting modifications to a recipe (e.g. This biscuit has too many raisins, and it is falling apart, so next time I will use less raisins).	<ul style="list-style-type: none">• Evaluating an end product and thinking of other ways in which to create similar items.
-----------------	---	--	---

Knowledge	<i>Mechanical Systems</i> Pneumatic toys	<i>Cooking and Nutrition</i> Adapting a recipe	<i>Textiles</i> Cushions
Technical	<ul style="list-style-type: none"> • 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. 		<ul style="list-style-type: none"> • To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces
Additional	<ul style="list-style-type: none"> • To understand how sketches, drawings and diagrams can be used to communicate design ideas. • To know that exploded-diagrams are used to show how different parts of a product fit together. • To know that thumbnail sketches are small drawings to get ideas down on paper quickly. 	<ul style="list-style-type: none"> • To know that not all fruits and vegetables can be grown in the UK. • To know that climate affects food growth. • To know that vegetables and fruit grow in certain seasons. • To know that cooking instructions are known as a 'recipe'. • To know that imported food is food which has been brought into the country. • To know that exported food is food which has been sent to another country. • To understand that imported foods travel from far away and this can negatively impact the environment. • To know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre. • To understand that vitamins, minerals and fibre are important for energy, growth and maintaining health. 	<ul style="list-style-type: none"> • 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.

		<ul style="list-style-type: none"> • To know safety rules for using, storing and cleaning a knife safely. • To know that similar coloured fruits and vegetables often have similar nutritional benefits. 	
End Point	To design and make a product which uses a pneumatic system.	To adapt a recipe to improve it or change it to meet new criteria.	<p>To use cross stitch to join fabrics.</p> <p>To decorate their product using applique.</p>

Lower Key Stage 2			
Year B			
Skills	Autumn	Spring	Summer
		<p><i>Structures</i></p> <p>Constructing a castle</p>	<p><i>Electrical Systems</i></p> <p>Electric Poster</p>
Design	<ul style="list-style-type: none"> • 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 needed and colours. • Designing and/or decorating a castle tower on CAD software. 	<ul style="list-style-type: none"> • Carry out research based on a given topic (e.g. The Romans) to develop a range of initial ideas. • Generate a final design for the electric poster with consideration to the client's needs and design criteria. • Design an electric poster that fits the requirements of a given brief. • Plan the positioning of the bulb (circuit component) and its purpose. 	<ul style="list-style-type: none"> • 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 by using computer-aided design (CAD), to produce a logo. • Following a list of design requirements.

<p style="text-align: center;">Make</p>	<ul style="list-style-type: none"> • Constructing a range of 3D geometric shapes using nets . • Creating special features for individual designs. • Making facades from a range of recycled materials 	<ul style="list-style-type: none"> • Create a final design for the electric poster. • Mount the poster onto corrugated card to improve its strength and allow it to withstand the weight of the circuit on the rear. • Measure and mark materials out using a template or ruler. • Fit an electrical component (bulb). • Learn ways to give the final product a higher quality finish (e.g. framing to conceal a roughly cut edge) 	<ul style="list-style-type: none"> • Developing a prototype case for my mindful moment timer. • Creating a 3D structure using a net. • Programming a micro:bit in the Microsoft micro:bit editor, to time a set number of seconds/minutes upon button press.
<p style="text-align: center;">Evaluate</p>	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Learning to give and accept constructive criticism on own work and the work of others. • Testing the success of initial ideas against the design criteria and justifying opinions. • Revisiting the requirements of the client to review developing design ideas and check that they fulfil their needs. 	<ul style="list-style-type: none"> • 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. • Testing my program for bugs (errors in the code). • Finding and fixing the bugs (debug) in my code.

Knowledge	<p style="text-align: center;"><i>Structures</i></p> <p style="text-align: center;">Constructing a castle</p>	<p style="text-align: center;"><i>Electrical Systems</i></p> <p style="text-align: center;">Electric Poster</p>	<p style="text-align: center;"><i>Digital World</i></p> <p style="text-align: center;">Mindful moments timer</p>
<p style="text-align: center;">Technical</p>	<ul style="list-style-type: none"> • To understand that wide and flat based objects are more stable. • To understand the importance of strength and stiffness in structures. 	<ul style="list-style-type: none"> • To understand that an electrical system is a group of parts (components) that work together to transport electricity around a circuit. • To understand common features of an electric product (switch, battery or plug, dials, buttons etc.). 	<ul style="list-style-type: none"> • To understand what variables are in programming. • To know some of the features of a Micro:bit. • To know that an algorithm is a set of instructions to be followed by the computer. • To know that it is important to check my code for errors (bugs).

		<ul style="list-style-type: none"> • To list examples of common electric products (kettle, remote control etc.). <p>To understand that an electric product uses an electrical system to work (function).</p> <ul style="list-style-type: none"> • To know the name and appearance of a bulb, battery, battery holder and crocodile wire to build simple circuits. 	<ul style="list-style-type: none"> • To know that a simulator can be used as a way of checking your code works before installing it onto an electronic device.
Additional	<ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • To know that a paper net is a flat 2D shape that can become a 3D shape once assembled. • To know that a design specification is a list of success criteria for a product. 	<ul style="list-style-type: none"> • To understand the importance and purpose of information design. • To understand how material choices (such as mounting paper to corrugated card) can improve a product to serve its purpose (remain rigid without bending when the electrical circuit is attached). 	<ul style="list-style-type: none"> • To understand the terms 'ergonomic' and 'aesthetic'. • To know that a prototype is a 3D model made out of cheap materials, that allows us to test design ideas and make better decisions about size, shape and materials.
End Point	To create a range of 3D geometric shapes using nets.	To create a product with an electrical component.	To program a micro:bit in the Microsoft micro:bit editor.

Upper Key Stage 2

Year A

	Autumn	Spring	Summer
Skills	<i>Mechanical Systems</i> Making a pop-up book	<i>Cooking and Nutrition</i> What could be healthier?	<i>Textiles</i> Waistcoats
Design	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Designing a waistcoat in accordance to a specification linked to set of design criteria. • Annotating designs, to explain their decisions.
Make	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Using a template when cutting fabric to ensure they achieve the correct shape. • Using pins effectively to secure a template to fabric without creases or bulges. • Marking and cutting fabric accurately, in accordance with their design. • Sewing a strong running stitch, making small, neat stitches and following the edge. - Tying strong knots. • Decorating a waistcoat, attaching features (such as appliqué) using thread. • Finishing the waistcoat with a secure fastening (such as buttons). • Learning different decorative stitches. • Sewing accurately with evenly spaced, neat stitches.

<p>Evaluate</p>	<ul style="list-style-type: none">• Evaluating the work of others and receiving feedback on own work.• Suggesting points for improvement.	<ul style="list-style-type: none">• Identifying the nutritional differences between different products and recipes.• Identifying and describing healthy benefits of food groups.	<ul style="list-style-type: none">• Reflecting on their work continually throughout the design, make and evaluate process.
-----------------	--	---	---

Knowledge	<i>Mechanical Systems</i> Making a pop-up book	<i>Cooking and Nutrition</i> What could be healthier?	<i>Textiles</i> Waistcoats
Technical	<ul style="list-style-type: none"> • 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. 		
Additional	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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 bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects. 	<ul style="list-style-type: none"> • To understand that it is important to design clothing with the client/ target customer in mind. • To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric. • To understand the importance of consistently sized stitches.
End Point	<p>To make a mechanisms and/or structures using sliders, pivots and folds to produce movement.</p>	<p>To describe the healthy benefits of food groups and use their knowledge to adapt a recipe.</p> <p>To follow a step by step by step method carefully.</p>	<p>To mark and cut fabric accurately.</p> <p>To sew accurately with evenly spaced, neat stitches.</p>

Upper Key Stage 2

Year B

Skills	Autumn	Spring	Summer
	<i>Structures</i> Playgrounds	<i>Electrical Systems</i> Steady hand game	<i>Digital World</i> Monitoring devices
Design	<ul style="list-style-type: none"> • Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs. 	<ul style="list-style-type: none"> • 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'. 	<ul style="list-style-type: none"> • 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 combining one or more 3D objects, using CAD.
Make	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Understanding the functional and aesthetic properties of plastics. • Programming to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range.

<p>Evaluate</p>	<ul style="list-style-type: none">• Improving a design plan based on peer evaluation.• Testing and adapting a design to improve it as it is developed. <p>Identifying what makes a successful structure</p>	<ul style="list-style-type: none">• 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.	<ul style="list-style-type: none">• 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 key functions in my program (audible alert, visuals).• Explaining how my product would be useful for an animal carer including programmed features.
-----------------	--	---	--

Knowledge	<i>Structures</i> Playgrounds	<i>Electrical Systems</i> Steady hand game	<i>Digital World</i> Monitoring devices
Technical	<ul style="list-style-type: none"> • To know that structures can be strengthened by manipulating materials and shapes. 	<ul style="list-style-type: none"> • To know that batteries contain acid, which can be dangerous if they leak. • To know the names of the components in a basic series circuit, including a buzzer. 	<ul style="list-style-type: none"> • 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.
Additional	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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'. 	<ul style="list-style-type: none"> • To understand key developments in thermometer history. • To know events or facts that took place over the last 100 years in the history of plastic, and how this is changing our outlook on the future. • To know the 6Rs of sustainability. • To understand what a virtual model is and the pros and cons of traditional vs CAD modelling.
End Point	To create a range of structures.	To make and test a circuit and incorporate this into their product.	To manoeuvre 3D objects, change the properties of, or combine one or more 3D objects, using CAD.