Design and Technology Progression Map

Units of Learning Kapow	EYFS Nursery	EYFS Foundation Stage	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	● Develop their small motor skills so they can use a range of tools competently, safely and confidently. ● Explore different materials freely, in order to develop their ideas about how to use them and what to make. ● Develop their own ideas and then decide which materials to use to express them. ● Join different materials and explore different textures. ● Make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park.	● Use a range of small tools, including scissors, paintbrushes and cutlery. ● Return to and build on their previous learning, refining ideas and developing their ability to represent them. Create collaboratively sharing ideas, resources and skills. ELG ● Use a range of small tools, including scissors, paintbrushes and cutlery. ● Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. ● Share their creations, explaining the process they have used.	Design - design purposeful, functional, appealing products for themselves and other users based on design criteria generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology Make select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics Evaluate explore and evaluate a range of existing products evaluate their ideas and products against design criteria Technical knowledge build structures, exploring how they can be made stronger, stiffer and more stable Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products. Cooking and Nutrition use the basic principles of a healthy and varied diet to prepare dishes Understand where food comes from.		Design use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design Make select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities Evaluate investigate and analyse a range of existing products evaluate their ideas and products against their own design criteria and consider the views of others to improve their work understand how key events and individuals in design and technology have helped shape the world Technical knowledge apply their understanding of how to strengthen, stiffen and reinforce more complex structures understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] Apply their understanding of computing to program, monitor and control their products. Cooking and Nutrition understand and apply the principles of a healthy and varied diet prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.		

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Substantive Knowledge **Textiles**	**Over the Rainbow** Join different materials and explore different textures.	**Imagine that!** Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.		**Textiles- Sewing Skills (Pouches- Kapow)** To know that sewing is a method of joining fabric. 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.		**Textiles- fastenings (Kapow)** To know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and velcro. To know that different fastening types are useful for different purposes. To know that creating a mock up (prototype) of their design is useful for checking ideas and proportions	**Textiles- Make a Stuffed Toy (Kapow)** To know that blanket stitch is useful to reinforce the edges of a fabric material or join two pieces of fabric. To understand that it is easier to finish simpler designs to a high standard. To know that soft toys are often made by creating appendages separately and then attaching them to the main body. To know that small, neat stitches which are pulled taut are important to ensure that the soft toy is strong and holds the stuffing securely.	
Disciplinary Knowledge (skills) **Textiles**	**Over the rainbow** Join different materials and explore different textures.	**Imagine that!** Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.		**Textiles- Sewing Skills (Pouches- Kapow)** **Design-** Designing a pouch. **Make-** Selecting and cutting fabrics for sewing. Decorating a pouch using fabric glue or running stitch.		**Textiles- fastenings (Kapow)** **Design-** Writing design criteria for a product, articulating decisions made. Designing a book sleeve. **Make-**	**Textiles- Make a Stuffed Toy (Kapow)** **Design-** Designing a stuffed toy, considering the main component shapes required and creating an appropriate template. Considering the proportions of	

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				Threading a needle. Sewing running stitch, with evenly spaced, neat, even stitches to join fabric. Neatly pinning and cutting fabric using a template. **Evaluate-** Reflecting on a finished product, explaining likes and dislikes		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 by sewing small, straight stitches. Incorporating fastening to a design **Evaluate-** 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. Articulating the advantages and disadvantages of different fastening types	individual components. **Make-** 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. Threading needles independently. Using appliqué to attach pieces of fabric decoration. Sewing blanket stitch to join fabric. Applying blanket stitch so the spaces between the stitches are even and regular. **Evaluate-** Testing and evaluating an end product and giving point for further improvements	

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Key Vocabulary	**Over the rainbow** Material Texture Colour Fabric Paint	**Imagine that!** Colour Fabric Paint Print decorate		**Textiles- Sewing Skills (Pouches- Kapow)** Running-stitch Sew Shape Stencil Template Thimble		**Textiles- fastenings (Kapow)** Aesthetic Assemble strengthen Fastening Mock-up Target audience	**Textiles- Make a Stuffed Toy (Kapow)** Accurate Annotate Appendage Blanket-stitch technique seam	
Substantive Knowledge **Cooking and Nutrition**	**Night and Day** Develop their small motor skills so they can use a range of tools competently, safely and confidently **Down at the bottom of the Garden** Develop their small motor skills so they can use a range of tools competently, safely and confidently	**Magical Me** Use a range of small tools, including scissors, paintbrushes and cutlery. Create collaboratively sharing ideas, resources and skills **Let's Celebrate** Use a range of small tools, including scissors, paintbrushes and cutlery. Create collaboratively sharing ideas, resources and skills **What's in the woods?** Use a range of small tools, including scissors, paintbrushes and cutlery. Share their creations, explaining the process they have used.	**Make a Smoothie (Kapow)** 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,	**Designing a Healthy Meal (Kapow)** Designing a healthy wrap based on a food combination which works well together Slicing food safely using the bridge or claw grip. Constructing a wrap that meets a design brief. 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. 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.	**Eating Seasonally (Kapow)** 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.	**Adapting a recipe (Kapow)** 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.	**What could be healthier? (Kapow)** 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	**Making bread and soup** 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).

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			leaves: lettuce, fruit: cucumber). Learning where and how fruits and vegetables grow.	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. 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 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. 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.			
Disciplinary knowledge (Skills) **Cooking and Nutrition**	**<u>Night and Day</u>** Develop their small motor skills so they can use a range of tools competently, safely and confidently **<u>Down at the bottom of the Garden</u>** Develop their small motor skills so they can use a range of tools	**<u>Magical Me</u>** Use a range of small tools, including scissors, paintbrushes and cutlery. Create collaboratively sharing ideas, resources and skills **<u>Let's Celebrate</u>**	**<u>Make a Smoothie (Kapow)</u>** **Design-** Designing smoothie carton packaging by-hand or on ICT software **Make-** Chopping fruit and vegetables safely to make a smoothie.	**<u>Designing a Healthy Meal (Kapow)</u>** **Design-** Designing a healthy wrap based on a food combination which works well together **Make-** Slicing food safely using the bridge or claw grip.	**<u>Eating Seasonally (Kapow)</u>** **Design-** Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish.	**<u>Adapting a recipe (Kapow)</u>** **Design-** Designing a biscuit within a given budget, drawing upon previous taste testing judgements **Make-** Following a baking recipe, from start to	**<u>What could be healthier? (Kapow)</u>** **Design-** Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients.	**<u>Making bread and soup</u>** **Design-** Writing a recipe, explaining the key steps, method and ingredients. Including facts and drawings from research undertaken **Make-**

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	competently, safely and confidently Use a range of small tools, including scissors, paintbrushes and cutlery. Share their creations, explaining the process they have used.	Use a range of small tools, including scissors, paintbrushes and cutlery. Create collaboratively sharing ideas, resources and skills **<u>What's in the woods?</u>** Use a range of small tools, including scissors, paintbrushes and cutlery. Share their creations, explaining the process they have used.	Identifying if a food is a fruit or a vegetable. **Evaluate-** Tasting and evaluating different food combinations. Describing appearance, smell and taste. Suggesting information to be included on packaging.	Constructing a wrap that meets a design brief. **Evaluate-** 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.	**Make-** 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 **Evaluate-** 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.	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). **Evaluate-** 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).	Writing an amended method for a recipe to incorporate the relevant changes to ingredients. Designing appealing packaging to reflect a recipe. **Make-** 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 **Evaluate-** Identifying the nutritional differences between different products and recipes. Identifying and describing healthy benefits of food groups.	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. **Evaluate-** 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 when scoring others' dishes, and when evaluating their own throughout the planning, preparation and cooking process. Evaluating health and safety in production to minimise cross contamination
Key Vocabulary	**<u>Night and Day</u>** Hot Cold Mix Healthy Chop Safely	**<u>Magical Me</u>** Mix Healthy spoon bowl toppings oats	**<u>Make a Smoothie (Kapow)</u>** Healthy Ingredients Peel Peeler Recipe Slice Smoothie	**<u>Designing a Healthy Meal (Kapow)</u>** Alternative Diet Balanced diet Healthy Ingredients Nutrients	**<u>Eating Seasonally (Kapow)</u>** Climate Exported Imported Nutrients Seasonal food Seasons	**<u>Adapting a recipe (Kapow)</u>** Adapt Budget Creaming Prototype Sieving Utilities	**<u>What could be healthier? (Kapow)</u>** Cross-contamination Ethical issues sustainable Reared Substitute Vegan	**<u>Making bread and soup</u>** Cross-contamination Imperative-verb Nationality sustainable Processed Reared

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Substantive Knowledge **Mechanisms / Mechanical Systems**			**Make a Moving Toy (Kapow)** 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 the frame of a vehicle (chassis) needs to be balanced. To know some real-life items that use wheels such as wheelbarrows, hamster wheels and vehicles.	**Make a Moving Storybook (Kapow)** To know that mechanisms are a collection of moving parts that work together as a machine to produce movement. To know that there is always an input and 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	**Make a Moving Robot - Levers and Sliders (PSM Capital)** To know that mechanisms are a collection of moving parts that work together as a machine to produce movement. To know that there is always an input and 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 some real-life objects that contain mechanisms		**Pop-up book (Kapow)** 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.	**Automata toys (Kapow)** 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. To understand how to use a bench hook and saw safely. To know that a set square can be used to help mark 90° angles.
Disciplinary Knowledge (Skills) **Mechanisms / Mechanical**			**Make a Moving Toy (Kapow)** **Design-** Designing a vehicle that includes wheels, axles and axle holders, that when	**Make a Moving Storybook (Kapow)** **Design-** Explaining how to adapt mechanisms, using bridges or guides to control the movement. • Designing	**Make a Moving Robot - Levers and Sliders (PSM Capital)** **Design-** Creating a class design criteria for a moving robot.		**Pop-up book (Kapow)** **Design-** Designing a pop-up book which uses a mixture of structures and mechanisms.	**Automata toys (Kapow)** **Design-** Experimenting with a range of cams, creating a design for an automata toy based on a choice of

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Systems			combined, will allow the wheels to move. Creating clearly labelled drawings that illustrate movement. **Make-** Adapting mechanisms, when: they do not work as they should. to fit their vehicle design. to improve how they work after testing their vehicle. **Evaluate-** Testing wheel and axle mechanisms, identifying what stops the wheels from turning, and recognising that a wheel needs an axle in order to move.	a moving story book for a given audience. **Make-** Following a design to create moving models that use levers and sliders. **Evaluate-** 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	Designing a moving robot for a specific audience in accordance with a design criteria Designing a toy which uses a levers and sliders 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 **Make-** 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 due to their functional and aesthetic characteristics. **Evaluate-** Using the views of others to improve designs. Testing and modifying the outcome,		Naming each mechanism, input and output accurately. Storyboarding ideas for a book **Make-** 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. **Evaluate-** Evaluating the work of others and receiving feedback on own work. Applying points of improvement to their books. Describing changes they would make/do if they were to do the project again.	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 my design. **Make-** 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

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					suggesting improvements.			at which the glue needs to dry/set. **Evaluate-** Evaluating the work of others and receiving feedback on their own work. Applying points of improvement to their toys. Describing changes they would make/do if they were to do the project again.
Key Vocabulary			**Make a Moving Toy (Kapow)** Axle Axle holder Chassis Design Mechanic Mechanism	**Make a Moving Storybook (Kapow)** Assemble Design Mechanism Model Sliders Stencil Template	**Make a Moving Robot - Levers and Sliders (PSM Capital)** Input Lever Linkage Mechanical Mechanism Pivot		**Pop-up book (Kapow)** Aesthetic Computer-aided design (CAD) Motion Output Pivot Prototype	**Automata toys (Kapow)** Automata Bench hook Cam Clamp Component Dowel
Substantive Knowledge **Electrical Systems**						**Fan Boats** To know that series circuits only have one direction for the electricity to flow. 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		**Steady hand game (Kapow)** To know that batteries contain acid, which can be dangerous if they leak. To know the names of the components in a basic series circuit, including a buzzer. To understand the diagram perspectives 'top view', 'side view' and 'back'. .

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						uses a motor to function.		
Disciplinary Knowledge **Electrical Systems**						**Fan Boats** **Design-** Designing a functional fan boat, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas. **Make-** Making a functional series circuit, incorporating a motor. Constructing a product with consideration for the design criteria. Using appropriate equipment to cut and attach materials **Evaluate-** Evaluating electrical products. Testing and evaluating the success of a final product. To evaluate ideas and product against design criteria and consider how to improve work.		**Steady hand game (Kapow)** **Design-** 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 **Make-** 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. **Evaluate-** Testing own and others finished games, identifying what went well and making suggestions for improvement.

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Key Vocabulary						**Fan Boats** Fan boat Float Glide Series circuit Configuration		**Steady hand game (Kapow)** Circuit Circuit symbol Component Conductor Copper Insulator
Substantive Knowledge **Structures**	**My World, Your world** Explore different materials freely, in order to develop their ideas about how to use them **Superheroes (people who help us)** Make imaginative and complex small world, with blocks and construction kits.	**Once Upon a Time** Looking at different types of bridges and exploring how to make them. Which is the strongest? Explore raft/boat building – construct a boat that will float exploring how to join the materials together, best materials to use. Return to and build on their previous learning, refining ideas and developing their ability to represent them. Create collaboratively sharing ideas, resources and skills.	**Model Houses (PSM Capital)** 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 houses). 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.		**Planters** Investigate similar products to the one to be made to give starting points for a design. Draw/sketch products to help analyse and understand how products are made. Research needs of user. Identify the strengths and weaknesses of their design ideas in relation to purpose/user. Decide which design idea to develop. Investigate key events and individuals in design and technology. Develop vocabulary related to the project. Create shell or frame structures.			

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					Make structures more stable by giving them a wide base.			
Disciplinary Knowledge (Skills) **Structures**	**My World, Your world** Explore different materials freely, in order to develop their ideas about how to use them **Superheroes (people who help us)** Make imaginative and complex small world, with blocks and construction kits.	**Once Upon a Time** Looking at different types of bridges and exploring how to make them. Which is the strongest? Explore raft/boat building – construct a boat that will float exploring how to join the materials together, best materials to use. Return to and build on their previous learning, refining ideas and developing their ability to represent them. Create collaboratively sharing ideas, resources and skills.	**Model Houses (PSM Capital)** **Design-** Learning the importance of a clear design criteria Including individual preferences and requirements in a design **Make-** Making stable structures from card, tape and glue Following instructions to cut and assemble the supporting structure **Evaluate-** Evaluating a structure according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't · Suggest points for improvements		**Planters** **Design-** Plan a sequence of actions to make a product. Record the plan by drawing using annotated sketches. Begin to use cross-sectional and exploded diagrams. Use prototypes to develop and share ideas. Think ahead about the order of their work and decide upon tools and materials. Propose realistic suggestions as to how they can achieve their design ideas. Consider aesthetic qualities of materials chosen. **Make-** Prepare pattern pieces as templates for their design. Cut slots. Select from a range of tools for cutting,			

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					shaping joining and finishing. Use tools with accuracy. Select from techniques for different parts of the process. Select from materials according to their functional properties. Plan the stages of the making process. Use appropriate finishing techniques. **Evaluate-** Consider and explain how the finished product could be improved. Discuss how well the finished product meets the design criteria of the user.			
Key Vocabulary	**My World, Your world** Block Stack Join Stronger Material Make	**Once Upon a Time** Structure Stronger Material Design Make	**Model Houses (PSM Capital)** Stronger Structure Materials Model Attach Design		**Planters** Stable Strong Structure Weak Design criteria Evaluate			