Structures

		Reception – Junk Modelling	
		Kapow Skills and Knowledge Progression	ELG
Skills	Design	• Making verbal plans and material choices. • Developing a junk model.	Expressive Arts and Design: Creating with Materials 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. Make use of props and materials when role-playing characters in narratives and stories.
	Make	• Improving fine motor/scissor skills with a variety of materials. • Joining materials in a variety of ways (temporary and permanent). • Joining different materials together. • Describing their junk model, and how they intend to put it together	Expressive Arts and Design: Creating with Materials 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. Make use of props and materials when role-playing characters in narratives and stories.
	Evaluate	• Giving a verbal evaluation of their own and others' junk models with adult support. • Checking to see if their model matches their plan. • Considering what they would do differently if they were to do it again. • Describing their favourite and least favourite part of their model.	Expressive Arts and Design: Being Imaginative and Expressive Invent, adapt, and recount narratives and stories with peers and their teacher. Perform songs, rhymes, poems, and stories with others, and (when appropriate) try to move in time with music.
Knowledge	Technical	• To know there are a range to different materials that can be used to make a model and that they are all slightly different.	Expressive Arts and Design: Creating with Materials Safely use and explore a variety of materials, tools, and techniques, experimenting with colour, design, texture, form, and function.

		• Making simple suggestions to fix their junk model.	Share their creations, explaining the process they have used. Make use of props and materials when role-playing characters in narratives and stories.

		Reception – Boats	
		Kapow Skills and Knowledge Progression	ELG
Skills	Design	• Designing a junk model boat.	Understanding the World: The Natural World
		• Using knowledge from exploration to inform design.	Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. Expressive Arts and Design: Creating with Materials 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. Make use of props and materials when role-playing characters in narratives and stories.

Structures

	Make	• Making a boat that floats and is waterproof, considering material choices.	Understanding the World: The Natural World Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. Expressive Arts and Design: Creating with Materials 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. Make use of props and materials when role-playing characters in narratives and stories.
	Evaluate	• Making predictions about, and evaluating different materials to see if they are waterproof. • Making predictions about, and evaluating existing boats to see which floats best. • Testing their design and reflecting on what could have been done differently. • Investigating the how the shapes and structure of a boat affect the way it moves.	Expressive Arts and Design: Creating with Materials 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. Make use of props and materials when role-playing characters in narratives and stories. Invent, adapt, and recount narratives and stories with peers and their teacher.

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			Perform songs, rhymes, poems, and stories with others and try to move in time with music.
Knowledge	Technical	• To know that 'waterproof' materials are those which do not absorb water.	Understanding the World: The Natural World Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
	Additional	• To know that some objects float and others sink. • To know the different parts of a boat.	Understanding the World: The Natural World Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

		Year 1 – Constructing a Windmill	
		Kapow Skills and Knowledge Progression	National Curriculum
Skills	Design	• Learning the importance of a clear design criteria.	Objective: Design purposeful, functional, appealing products for themselves and other users based on design criteria. Objective: Evaluate their ideas and products against design criteria. Objective: To know that design criteria is a list of points to ensure the product meets the client's needs and wants.
		• Including individual preferences and requirements in a design.	Objective: Design purposeful, functional, appealing products for themselves and other users based on design criteria.
	Make	• Making stable structures from card, tape and glue.	Objective: Build structures, exploring how they can be made stronger, stiffer and more stable.
		• Learning how to turn 2D nets into 3D structures.	Objective: Generate, develop, model, and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.
		• Following instructions to cut and assemble the supporting structure of a windmill.	Objective: Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing].
		• Making functioning turbines and axles which are assembled into a main supporting structure.	Objective: Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.
	Evaluate	• Evaluating a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't	Objective: Evaluate their ideas and products against design criteria. Objective: Explore and evaluate a range of existing products.
		• Suggest points for improvements	Objective: Evaluate their ideas and products against design criteria.

Structures

Knowledge	Technical	• To understand that the shape of materials can be changed to improve the strength and stiffness of structures.	Objective: Build structures, exploring how they can be made stronger, stiffer and more stable.
		• To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses).	Objective: Build structures, exploring how they can be made stronger, stiffer and more stable.
		• To understand that axles are used in structures and mechanisms to make parts turn in a circle.	Objective: Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.
		• To begin to understand that different structures are used for different purposes.	Objective: Build structures, exploring how they can be made stronger, stiffer and more stable.
		• To know that a structure is something that has been made and put together.	Objective: Build structures, exploring how they can be made stronger, stiffer and more stable.
	Additional	To know that a client is the person I am designing for.	Objective: Design purposeful, functional, appealing products for themselves and other users based on design criteria.
		To know that design criteria is a list of points to ensure the product meets the clients needs and wants.	Objective: Design purposeful, functional, appealing products for themselves and other users based on design criteria. Objective: Evaluate their ideas and products against design criteria.
		To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water, or generating electricity.	Objective: Explore and evaluate a range of existing products.
		To know that windmill turbines use wind to turn and make the machines inside work.	Objective: Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.
		To know that a windmill is a structure with sails that are moved by the wind.	Objective: Explore and evaluate a range of existing products.

		To know the three main parts of a windmill are the turbine, axle, and structure.	Objective: Build structures, exploring how they can be made stronger, stiffer, and more stable. Objective: Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.

		Year 2 – Baby Bear's Chair	
		Kapow Skills and Knowledge Progression	National Curriculum
Skills	Design	• Generating and communicating ideas using sketching and modelling.	Objective: Generate, develop, model, and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.
		• Learning about different types of structures, found in the natural world and in everyday objects.	Objective: Explore the features of structures. Objective: Build structures, exploring how they can be made stronger, stiffer, and more stable.
	Make	• Making a structure according to design criteria.	Objective: Design purposeful, functional, appealing products for themselves and other users based on design criteria. Objective: Build structures, exploring how they can be made stronger, stiffer, and more stable.
		• Creating joints and structures from paper/card and tape.	Objective: Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing].
		• Building a strong and stiff structure by folding paper	Objective: Build structures, exploring how they can be made stronger, stiffer, and more stable.
	Evaluate	Exploring the features of structures.	Objective: Explore the features of structures.
		Comparing the stability of different shapes.	Objective: Explore the features of structures.
		Testing the strength of own structures.	Objective: Evaluate the strength, stiffness, and stability of own structure.

Structures

		Identifying the weakest part of a structure.	Objective: Evaluate the strength, stiffness, and stability of own structure.
		Evaluating the strength, stiffness and stability of own structure.	Objective: Evaluate the strength, stiffness, and stability of own structure.
Knowledge	Technical	To know that shapes and structures with wide, flat bases or legs are the most stable.	Objective: Build structures, exploring how they can be made stronger, stiffer, and more stable.
		To understand that the shape of a structure affects its strength.	Objective: Build structures, exploring how they can be made stronger, stiffer, and more stable.
		• To know that materials can be manipulated to improve strength and stiffness.	Objective: Build structures, exploring how they can be made stronger, stiffer, and more stable.
		• To know that a structure is something which has been formed or made from parts.	Objective: Design purposeful, functional, appealing products for themselves and other users based on design criteria.
		• To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move.	Objective: Build structures, exploring how they can be made stronger, stiffer, and more stable.
		To know that a 'stiff' structure or material is one which does not bend easily.	Objective: Build structures, exploring how they can be made stronger, stiffer, and more stable.
		• To know that a 'strong' structure is one which does not break easily.	Objective: Build structures, exploring how they can be made stronger, stiffer, and more stable.
	Additional	To know that natural structures are those found in nature.	Objective: Explore and evaluate a range of existing products.
		• To know that man-made structures are those made by people.	Objective: Explore and evaluate a range of existing products.

		Year 3 – Constructing a Castle	
		Kapow Skills and Knowledge Progression	National Curriculum
Skills	Design	• Designing a castle with key features to appeal to a specific person/purpose.	Objective: 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.

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		• Drawing and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours.	Objective: Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces, and computer-aided design.
		• Designing and/or decorating a castle tower on CAD software.	Objective: Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces, and computer-aided design.
	Make	• Constructing a range of 3D geometric shapes using nets.	Objective: Apply their understanding of how to strengthen, stiffen, and reinforce more complex structures.
		• Creating special features for individual designs.	Objective: Apply their understanding of how to strengthen, stiffen, and reinforce more complex structures.
		• Making facades from a range of recycled materials.	Objective: 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	• Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design.	Objective: Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.
		• Suggesting points for modification of the individual designs.	Objective: Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.
Knowledge	Technical	• To understand that wide and flat based objects are more stable.	Objective: Apply their understanding of how to strengthen, stiffen, and reinforce more complex structures.
		• To understand the importance of strength and stiffness in structures.	Objective: Apply their understanding of how to strengthen, stiffen, and reinforce more complex structures.
	Additional	• To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose.	Objective: 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.
		• To know that a façade is the front of a structure.	Objective: Understand how key events and individuals in design and technology have helped shape the world.
		• To understand that a castle needed to be strong and stable to withstand enemy attack.	Objective: Apply their understanding of how to strengthen, stiffen, and reinforce more complex structures.

		• To know that a paper net is a flat 2D shape that can become a 3D shape once assembled.	Objective: Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces, and computer-aided design.
		• To know that a design specification is a list of success criteria for a product.	Objective: Investigate and analyse a range of existing products.

		Year 4 – Pavilions	
		Kapow Skills and Knowledge Progression	National Curriculum
Skills	Design	• Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect.	Objective: 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.
		• Building frame structures designed to support weight.	Objective: Apply their understanding of how to strengthen, stiffen, and reinforce more complex structures.
	Make	• Creating a range of different shaped frame structures.	Objective: Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces, and computer-aided design.
		• Making a variety of free standing frame structures of different shapes and sizes.	Objective: Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining, and finishing], accurately.
		• Selecting appropriate materials to build a strong structure and cladding.	Objective: 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.
		• Reinforcing corners to strengthen a structure.	Objective: Apply their understanding of how to strengthen, stiffen, and reinforce more complex structures.
		• Creating a design in accordance with a plan.	Objective: Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces, and computer-aided design.

Structures

		• Learning to create different textural effects with materials.	Objective: 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	•Evaluating structures made by the class.	Objective: Investigate and analyze a range of existing products.
		• Describing what characteristics of a design and construction made it the most effective.	Objective: Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.
		• Considering effective and ineffective designs.	Objective: Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.
Knowledge	Technical	• To understand what a frame structure is.	Objective: Apply their understanding of how to strengthen, stiffen, and reinforce more complex structures.
		• To know that a 'free-standing' structure is one which can stand on its own.	Objective: Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining, and finishing], accurately.
	Additional	• To know that a pavilion is a a decorative building or structure for leisure activities.	Objective: 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.
		• To know that cladding can be applied to structures for different effects.	Objective: 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.
		• To know that aesthetics are how a product looks.	Objective: Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.
		• To know that a product's function means its purpose.	Objective: 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.
		• To understand that the target audience means the person or group of people a product is designed for.	Objective: 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.
		• To know that architects consider light, shadow and patterns when designing.	Objective: Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces, and computer-aided design.

		Year 6 – Playgrounds	
		Kapow Skills and Knowledge Progression	National Curriculum
Skills	Design	• Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs.	Objective: 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.
	Make	• Building a range of play apparatus structures drawing upon new and prior knowledge of structures.	Objective: Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining, and finishing], accurately.
		• Measuring, marking and cutting wood to create a range of structures.	Objective: Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining, and finishing], accurately.
		• Using a range of materials to reinforce and add decoration to structures.	Objective: 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	• Improving a design plan based on peer evaluation.	Objective: Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.
		• Testing and adapting a design to improve it as it is developed.	Objective: Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.
		• Identifying what makes a successful structure.	Objective: Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.
Knowledge	Technical	• To know that structures can be strengthened by manipulating materials and shapes.	Objective: Apply their understanding of how to strengthen, stiffen, and reinforce more complex structures.

Structures

	Additional	• To understand what a 'footprint plan' is.	Objective: 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.
		• To understand that in the real world, design can impact users in positive and negative ways.	Objective: Understand how key events and individuals in design and technology have helped shape the world.
		• To know that a prototype is a cheap model to test a design idea.	Category: Make Objective: Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces, and computer-aided design.