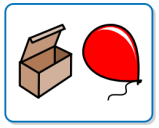
Year 3: Autumn

Mechanisms: Pneumatic Toys



Enquiry Question	**How can we make a toy using a pneumatic system?**	
	Required Prior Knowledge	**Knowledge to be taught**
Substantive Knowledge	• Mechanisms are a collection of moving parts that work together as a machine to produce movement. • There is always an input and an output in a mechanism. • An input is the energy that is used to start something working. • An output is the movement that happens as a result of the input. • A lever is something that turns on a pivot. • A linkage mechanism is made up of a series of levers (Y2 Spring)	• Pneumatic systems can be used as part of a mechanism. • Pneumatic systems operate by drawing in, releasing and compressing air. • Thumbnail sketches are small drawings to get ideas down on paper quickly. • Exploded diagrams are used to show how different parts of a product fit together.
Disciplinary Knowledge		
Design	• Design a toy that uses a pneumatic system. • Develop design criteria from a design brief. • Generate ideas using thumbnail sketches and exploded diagrams.	
Make	• Create a pneumatic system to create a desired motion. • Build a secure housing for a pneumatic system. • Use syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy. • Manipulate materials to create different effects by cutting, creasing, folding and weaving. • Select materials due to their functional and aesthetic characteristics.	
Evaluate	• Use the views of others to improve designs. • Test and modify the outcome, suggesting improvements.	
Vocabulary	**mechanism, lever, pivot, linkage system, pneumatic system, input, output, component, thumbnail sketch, research, adapt, properties, reinforce, motion**	

Teaching Sequence				
• *Explore examples* • *Make connections to previous learning* • *Make closer observations through sketching*	• *Model key techniques for children to try* • *Practise techniques/make a prototype*	• *Design own project*	• *Apply skills and knowledge learned to own project*	***ASSESSMENT*** *Evaluate own work*

Learning Questions	What are pneumatics?	How do pneumatics work?	Can I design my own toy using a pneumatic system?	Can I construct my own toy using a pneumatic system?	Can I evaluate my own toy using a pneumatic system against design criteria?
Mastery Keys	➢ Can design and make a toy using a pneumatic system to operate a moving part.				

Year 3: Spring

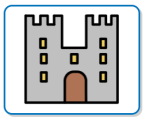
Textiles: Cushions

Enquiry Question	**How can we make a cushion and decorate it with applique?**				
	Required Prior Knowledge			**Knowledge to be taught**	
Substantive Knowledge	• Sewing is a method of joining fabric. • Different stitches can be used when sewing. • It is important to tie a knot after sewing the final stitch. • A thimble can be used to protect my fingers when sewing.			• Applique is a way of mending or decorating a textile by applying smaller pieces of fabric. • A seam is where two edges of fabric have been joined together. • It is important to leave space on the fabric for the seam. • Some products are turned inside out after sewing so that the stitching is hidden.	
Disciplinary Knowledge					
Design	• Design and make a template from an existing cushion and apply individual design criteria.				
Make	• Follow a design criteria to create a cushion. • Select and cut fabrics with ease using fabric scissors. • Thread needs and tie knots with greater independence. • Sew cross stitch to join fabric. • Decorate fabric using applique. • Complete design ideas with stuffing and sewing the edges.				
Evaluate	• Evaluate an end product and think of other ways in which to create similar items.				
Vocabulary	**appliqué, cross-stitch, design, equipment, fabric, patch, running stitch, thread, seam, texture, knot**				
Teaching Sequence	• *Explore examples* • *Make connections to previous learning* • *Make closer observations through sketching*	• *Model key techniques for children to try* • *Practise techniques/make a prototype*	• *Design own project*	• *Apply skills and knowledge learned to own project*	***ASSESSMENT*** *Evaluate own work*
Learning Questions	**How is cross stitch sewn?**	**What is applique?**	**Can I design my own cushion?**	**Can I create my own cushion?**	**Can I evaluate my finished project?**

Mastery Keys	➢ Can design and make a cushion, decorating it using applique and cross stitch and ensuring it is visually appealing.

Year 3: Summer

Structures: Castles



Enquiry Question	How can we make a model of a castle?	
	Required Prior Knowledge	**Knowledge to be taught**
Substantive Knowledge	• Castles often had features like towers, walls, battlements, drawbridges and gates. (Reception Castles & Crowns) • Cylinders are a strong type of structure and are the main shape used for windmills and lighthouses. • Different structures are used for different purposes. • A structure is something that has been made and put together. • A structure is something built for a reason. • Stable structures do not topple. • Adding weight to the base of a structure can make it more stable. (Y2 Structures)	• Wide and flat based objects are more stable. • Strength and stiffness are important in structures. • Features of a castle include: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse. • The facade is the front of a structure. • A castle needs to be strong and stable to withstand enemy attack. • A paper net is a flat 2D shapes that can become a 3D shape once assembled. • A design specification is a list of success criteria for a product.
Disciplinary Knowledge		
Design	• Design a castle with key features to appeal to a specific person/purpose. • Draw and label a castle design using 2D shapes.	
Make	• Construct a range of 3D geometric shapes using nets. • Create special features for individual designs. • Make facades from a range of recycled materials.	
Evaluate	• Evaluate own work and the work of others based on the aesthetic of the finished product and in comparison to the original design. • Suggest points for modification of the individual designs.	
Vocabulary	**2D, 3D, castle, design, key features, net, scoring, shape, stable, stiff, strong, structure, tab**	
Teaching Sequence	• *Explore examples* • *Make connections to previous learning* • *Make closer observations through sketching*	• *Model key techniques for children to try* • *Practise techniques/make a prototype*
	• *Design own project*	• *Apply skills and knowledge learned to own project*
		ASSESSMENT *Evaluate own work*

Learning Questions	What are the features of a castle?	How can 2D and 3D shapes be combined to form a strong and stable structure?	Can I design a castle?	Can I construct my own castle?	Can I evaluate my final product?
Mastery Keys	➢ Can design and make own castle, using a variety of 3D shapes with at least one created from a net.				