



'Love your neighbour as yourself' (Luke 10:27)

# St. Brigid's C of E Primary Design and Technology Progression of Skills and Knowledge Overview

Inspiring, nurturing and educating our children to serve God by reaching their full potential, serving our local community and by looking after our environment as global citizens of today and tomorrow.



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Year Group		Mechanisms Year 1	Mechanisms Year 2	Mechanical Systems Year 3	Mechanical Systems Year 5
		Wheels and Axles	Making a Moving Monster	Pneumatic Toys	Automata Toys
Skills	Design	Designing a vehicle that includes wheels, axles and axle holders, that when combined, will allow the wheels to move. Creating clearly labelled drawings that illustrate movement.	Creating a class design criteria for a moving monster. Designing a moving monster for a specific audience in accordance with a design criteria.	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.	Experimenting with a range of cams, creating a design for an automata toy based on a choice of 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	Adapting mechanisms, when: <ul style="list-style-type: none"> <li>they do not work as they should.</li> <li>to fit their vehicle design.</li> <li>to improve how they work after testing their vehicle.</li> </ul>	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.	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.	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 at which the glue needs to dry/set.
	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.	Evaluating own designs against design criteria. Using peer feedback to modify a final design.	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.	Evaluating the work of others and receiving feedback on own work. Applying points of improvement to their toys. Describing changes they would make/do if they were to do the project again.

Knowledge	Technical	<p>To know that wheels need to be round to rotate and move.</p> <p>To understand that for a wheel to move it must be attached to a rotating axle.</p> <p>To know that an axle moves within an axle holder which is fixed to the vehicle or toy.</p> <p>To know that the frame of a vehicle (chassis) needs to be balanced.</p>	<p>To know that mechanisms are a collection of moving parts that work together as a machine to produce movement.</p> <p>To know that there is always an input and output in a mechanism.</p> <p>To know that an input is the energy that is used to start something working.</p> <p>To know that an output is the movement that happens as a result of the input.</p> <p>To know that a lever is something that turns on a pivot.</p> <p>To know that a linkage mechanism is made up of a series of levers.</p>	<p>To understand how pneumatic systems work.</p> <p>To understand that pneumatic systems can be used as part of a mechanism.</p> <p>To know that pneumatic systems operate by drawing in, releasing and compressing air.</p>	<p>To understand that the mechanism in an automata uses a system of cams, axles and followers.</p> <p>To understand that different shaped cams produce different outputs.</p>
	Additional	<p>To know some real-life items that use wheels such as wheelbarrows, hamster wheels and vehicles.</p>	<p>To know some real-life objects that contain mechanisms</p>	<p>To understand how sketches, drawings and diagrams can be used to communicate design ideas.</p> <p>To know that exploded-diagrams are used to show how different parts of a product fit together.</p> <p>To know that thumbnail sketches are small drawings to get ideas down on paper quickly.</p>	<p>To know that an automata is a hand powered mechanical toy.</p> <p>To know that a cross-sectional diagram shows the inner workings of a product.</p> <p>To understand how to use a bench hook and saw safely.</p> <p>To know that a set square can be used to help mark 90° angles.</p>