

St. Joseph's R.C. Primary School  
**Design and Technology Progression of Skills and Knowledge**



**Mechanisms / Mechanical Structures**

		<b>Year 2</b> Fairground Wheel & Moving Monsters		<b>Year 4</b> Slingshot Cars		<b>Year 5</b> Pop-up Books	
<b>Skills</b>	<b>Design</b>	<ul style="list-style-type: none"> <li>• Selecting a suitable linkage system to produce the desired motion.</li> <li>• Designing a wheel.</li> </ul>	<ul style="list-style-type: none"> <li>• Creating a class design criterion for a moving monster.</li> <li>• Designing a moving monster for a specific audience in accordance with a design criteria</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a shape that reduces air resistance.</li> <li>• Drawing a net to create a structure from.</li> <li>• Choosing shapes that increase or decrease speed as a result of air resistance.</li> <li>• Personalising a design.</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a pop-up book which uses a mixture of structures and mechanisms.</li> <li>• Naming each mechanism, input and output accurately.</li> <li>• Storyboarding ideas for a book.</li> </ul>		
	<b>Make</b>	<ul style="list-style-type: none"> <li>• Selecting materials according to their characteristics.</li> <li>• Following a design brief.</li> </ul>	<ul style="list-style-type: none"> <li>• Making linkages using card for levers and split pins for pivots.</li> <li>• Experimenting with linkages adjusting the widths, lengths and thicknesses of card used.</li> <li>• Cutting and assembling components neatly.</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring, marking, cutting and assembling with increasing accuracy.</li> <li>• Making a model based on a chosen design.</li> </ul>	<ul style="list-style-type: none"> <li>• Following a design brief to make a pop up book, neatly and with focus on accuracy.</li> <li>• Making mechanisms and/or structures using sliders, pivots and folds to produce movement.</li> <li>• Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.</li> </ul>		
	<b>Evaluate</b>	<ul style="list-style-type: none"> <li>• Evaluating different designs.</li> <li>• Testing and adapting a design.</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluating own designs against design criteria.</li> <li>• Using peer feedback to modify a final design.</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluating the work of others and receiving feedback on own work.</li> <li>• Suggesting points for improvement.</li> </ul>		
<b>Knowledge</b>	<b>Technical</b>	<ul style="list-style-type: none"> <li>• To know that different materials have different properties and are therefore suitable for different uses</li> </ul>	<ul style="list-style-type: none"> <li>• To know that mechanisms are a collection of moving parts that work together as a machine to produce movement.</li> <li>• To know that there is always an input and output in a mechanism.</li> <li>• To know that an input is the energy that is used to start something working.</li> <li>• To know that an output is the movement that happens as a result of the input.</li> <li>• To know that a lever is something that turns on a pivot.</li> <li>• To know that a linkage mechanism is made up of a series of levers.</li> </ul>	<ul style="list-style-type: none"> <li>• To understand that all moving things have kinetic energy.</li> <li>• To understand that kinetic energy is the energy that something (object/person) has by being in motion.</li> <li>• To know that air resistance is the level of drag on an object as it is forced through the air.</li> <li>• To understand that the shape of a moving object will affect how it moves due to air resistance.</li> </ul>	<ul style="list-style-type: none"> <li>• To know that mechanisms control movement.</li> <li>• To understand that mechanisms can be used to change one kind of motion into another.</li> <li>• To understand how to use sliders, pivots and folds to create paper-based mechanisms.</li> </ul>		
	<b>Additional</b>	<ul style="list-style-type: none"> <li>• To know the features of a Ferris wheel include the wheel, frame, pods, a base an axle and an axle holder.</li> <li>• To know that it is important to test my design as I go along so that I can</li> </ul>	<ul style="list-style-type: none"> <li>• To know some real-life objects that contain mechanisms.</li> </ul>	<ul style="list-style-type: none"> <li>• To understand that products change and evolve over time.</li> <li>• To know that aesthetics means how an object or product looks in design and technology.</li> <li>• To know that a template is a stencil you can use to help you draw the same shape accurately.</li> </ul>	<ul style="list-style-type: none"> <li>• To know that a design brief is a description of what I am going to design and make.</li> <li>• To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.</li> </ul>		

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		solve any problems that may occur.	<ul style="list-style-type: none"><li>• To know that a birds-eye view means a view from a high angle (as if a bird in flight).</li><li>• To know that graphics are images which are designed to explain or advertise something.</li><li>• To know that it is important to assess and evaluate design ideas and models against a list of design criteria.</li></ul>	
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**Please note:** not all year groups are included for each separate element due to our **combined and condensed curriculum.**