



## St Joseph's Catholic Primary School

### Design & Technology Progression of Skills

Mechanisms								
	F1	F2	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design	<ul style="list-style-type: none"> <li>• Explore different materials freely, in order to develop their ideas about how to use them and what to make.</li> </ul>	<ul style="list-style-type: none"> <li>• Explore, use and refine a variety of artistic effects to express their ideas and feelings.</li> </ul>	<ul style="list-style-type: none"> <li>• Explaining how to adapt mechanisms, using bridges or guides to control the movement</li> <li>• Designing a moving story book for a given audience</li> <li>• Designing a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move</li> <li>• Creating clearly labelled drawings which illustrate</li> </ul>	<ul style="list-style-type: none"> <li>• Creating a class design criteria for a moving frog</li> <li>• Designing a moving frog for a specific audience in accordance with a design criteria</li> <li>• Selecting a suitable linkage system to produce the desired motions</li> <li>• Designing a wheel</li> <li>• Selecting appropriate materials based on their properties</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a toy which uses a pneumatic system</li> <li>• Developing design criteria from a design brief</li> <li>• Generating ideas using thumbnail sketches and exploded diagrams</li> <li>• Learning that different types of drawings are used in design to explain ideas clearly</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>	<ul style="list-style-type: none"> <li>• After experimenting with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement</li> <li>• Understanding how linkages change the direction of a force</li> <li>• Making things move at the same time</li> </ul>



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<p><b>Make</b></p>	<ul style="list-style-type: none"> <li>• Make simple models which express their ideas.</li> <li>• Make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park.</li> </ul>	<ul style="list-style-type: none"> <li>• Create collaboratively sharing ideas, resources and skills.</li> </ul>	<p>movement</p> <ul style="list-style-type: none"> <li>• Following a design to create moving models that use levers and sliders</li> <li>• Adapting mechanisms</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> <li>• Selecting materials according to their characteristics</li> <li>• Following a design brief</li> </ul>	<ul style="list-style-type: none"> <li>• Creating a pneumatic system to create a desired motion</li> <li>• Building secure housing for a pneumatic system</li> <li>• Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy</li> <li>• Selecting materials due to their functional and aesthetic characteristics</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>	<ul style="list-style-type: none"> <li>• Measuring, marking and checking the accuracy of the jelutong and dowel pieces required</li> <li>• Measuring, marking and cutting components accurately using a ruler and scissors</li> <li>• Assembling components accurately to make a stable frame</li> <li>• Understanding that for the frame to function effectively the components must be cut</li> </ul>
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					<ul style="list-style-type: none"> <li>Manipulating materials to create different effects by cutting, creasing, folding, weaving</li> </ul>			<p>accurately and the joints of the frame secured at right angles</p> <ul style="list-style-type: none"> <li>Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set</li> </ul>
<b>Evaluate</b>	<ul style="list-style-type: none"> <li>Develop their own ideas and then decide which materials to use to express them.</li> </ul>	<ul style="list-style-type: none"> <li>Return to and build on their previous learning, refining ideas and developing their ability to represent them.</li> </ul>	<ul style="list-style-type: none"> <li>Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed</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> <li>Evaluating different designs</li> <li>Testing and adapting a design</li> </ul>	<ul style="list-style-type: none"> <li>Using the views of others to improve designs</li> <li>Testing and modifying the outcome, suggesting improvements</li> </ul>	<ul style="list-style-type: none"> <li>Evaluating the speed of a final product based on: the affect 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>	<ul style="list-style-type: none"> <li>Evaluating the work of others and receiving feedback on own work</li> <li>Applying points of improvements</li> <li>Describing changes they would make/</li> </ul>



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			<ul style="list-style-type: none"> <li>• Reviewing the success of a product by testing it with its intended audience</li> <li>• Testing mechanisms, identifying what stops wheels from turning, knowing</li> <li>• that a wheel needs an axle in order to move</li> </ul>					do if they were to do the project again
<b>Technical Knowledge</b>	Learning about different materials	Joins different material and explore different textures	<ul style="list-style-type: none"> <li>• Learning that levers and sliders are mechanisms and can make things move</li> <li>• Identifying whether a mechanism</li> <li>• is a lever or slider</li> </ul>	<ul style="list-style-type: none"> <li>• Learning that mechanisms are a collection of moving parts that work together in a machine</li> <li>• Learning that there is an input and output in a mechanism</li> <li>• Identifying</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding how pneumatic systems work</li> <li>• Learning that mechanisms are a system of parts that work together to create motion</li> </ul>	<ul style="list-style-type: none"> <li>• Learning that products change and evolve over time</li> <li>• Learning that all moving things have kinetic energy</li> <li>• Understanding</li> </ul>	<ul style="list-style-type: none"> <li>• Knowing that an input is the motion used to start a mechanism</li> <li>• Knowing that output is the motion that happens as a result of starting the input</li> </ul>	<ul style="list-style-type: none"> <li>• Using a bench hook to saw safely and effectively</li> <li>• Exploring cams, learning that different shaped cams produce different follower movements</li> <li>• Exploring types</li> </ul>



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			<p>and determining what movement the mechanism will make</p> <ul style="list-style-type: none"> <li>• Using the vocabulary: up, down, left, right, vertical and horizontal to describe movement</li> <li>• Identifying what mechanism makes a toy or vehicle roll forwards</li> <li>• Learning that for a wheel to move it must be attached to an axle</li> </ul>	<p>mechanisms in everyday objects</p> <ul style="list-style-type: none"> <li>• Learning that a lever is something that turns on a pivot</li> <li>• Learning that a linkage is a system of levers that are connected by pivots</li> <li>• Exploring wheel mechanisms</li> <li>• Learning how axels help wheels to move a vehicle</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding that pneumatic systems can be used as part of a mechanism</li> <li>• Learning that pneumatic systems force air over a distance to create movement</li> </ul>	<p>that kinetic energy is the energy that something (object person) has by being in motion</p>	<ul style="list-style-type: none"> <li>• Knowing that mechanisms control movement</li> <li>• Describing mechanisms that can be used to change one kind of motion into another</li> </ul>	<p>of motions and direction of a motion</p> <p>different shaped cams produce different follower movements</p> <ul style="list-style-type: none"> <li>• Exploring types of motions and direction of a motion</li> </ul>
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