



MATERIALS	Learning Objective	Activity	Key Knowledge (By the end of the lesson)		Vocabulary (Tier 3)
			Substantive	Disciplinary	
Lesson 1	L.O. : To be able to investigate and analyse a range of existing products	Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources to explore fairground rides.  Explore pulleys and their uses.	<ul style="list-style-type: none"> <li>How do fairground rides work? Explore the mechanisms that create movement</li> </ul>	<ul style="list-style-type: none"> <li>Using a construction kit, investigate combinations of two different sized pulleys to learn about direction and speed of rotation e.g. How many times does the smaller pulley turn each time the larger pulley turns once? Do the pulleys move in the same direction? How can you reverse the direction of rotation?</li> </ul>	pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor circuit, switch,
Lesson 2	LO: To be able to generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and	<ul style="list-style-type: none"> <li>Develop a simple design specification to guide their thinking.</li> <li>Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views.</li> </ul>	<ul style="list-style-type: none"> <li>Know different methods of communicating ideas</li> </ul>	<ul style="list-style-type: none"> <li>Create clear and detailed drawing of their planned product</li> <li>Share designs</li> </ul>	circuit diagram annotated drawings, exploded diagrams mechanical system, electrical system, input, process, output

	computer-aided design				
Lesson 3	<p>LO: To be able to select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</p> <p>LO: To be able to select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic</p> <p>Qualities</p> <p>L.O: To be able to understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages).</p> <p>L.O: To be able to understand and use electrical systems in their products (for example, series circuits incorporating switches,</p>	Create a plan to accompany their drawings listing equipment and ordered method of construction.	<p>Understand that mechanical and electrical systems have an input, process and an output.</p> <ul style="list-style-type: none"> <li>• Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement.</li> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>	<ul style="list-style-type: none"> <li>• Produce detailed lists of tools, equipment and materials.</li> </ul> <p>Formulate step-by-step plans and, if appropriate, allocate tasks within a team.</p>	<p>pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor circuit, switch,</p>

	bulbs, buzzers and motors).				
Lesson 4	<p>L.O: To be able to understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages).</p> <p>L.O: To be able to understand and use electrical systems in their products (for example, series circuits incorporating switches, bulbs, buzzers and motors).</p>	Begin to make their product following their own plans.	<p>Understand that mechanical and electrical systems have an input, process and an output.</p> <ul style="list-style-type: none"> <li>• Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement.</li> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>	<ul style="list-style-type: none"> <li>• Select from and use a range of tools and equipment to make products that are accurately assembled and well finished.</li> <li>• Work within the constraints of time, resources and cost.</li> </ul>	pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor circuit, switch,
Lesson 5	<p>L.O: To be able to understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages).</p> <p>L.O: To be able to understand and use electrical systems in their products (for example, series circuits incorporating switches,</p>	Construct their final product adding designs to improve the aesthetics.	<p>Understand that mechanical and electrical systems have an input, process and an output.</p> <ul style="list-style-type: none"> <li>• Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement.</li> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>	<ul style="list-style-type: none"> <li>• Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished.</li> <li>• Work within the constraints of time, resources and cost.</li> </ul>	pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor circuit, switch,

	bulbs, buzzers and motors).				
Lesson 6	LO:To be able to evaluate their ideas and products against their own design criteria and consider the views of others to improve their work	Evaluate, test and compare their products.	<ul style="list-style-type: none"> <li>• Understand that mechanical and electrical systems have an input, process and an output.</li> <li>• Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement.</li> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>	<ul style="list-style-type: none"> <li>• Compare the final product to the original design specification.</li> <li>• Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose.</li> <li>• Consider the views of others to improve their work.</li> </ul>	design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief

<p>L.O. 9: To be able to understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages).</p> <p>L.O. 10: To be able to understand and use electrical systems in their products (for example, series circuits incorporating</p>	<p><b>The children are going to be designing, creating and experimenting with ideas for a new exciting and enjoyable THEME PARK ride. Introduce the idea of using an electrical circuit to operate the ride, such as a 'carousel'.</b></p>	<p><b>In pairs: Begin the design process for the carousel - consider the theme for the ride, e.g. space, superheroes, TRADITIONAL FAIRGROUND ART.</b></p> <ul style="list-style-type: none"> <li>- Provide the children with a set selection of tools and materials to create a model for a new ride. Follow the example on youtube: How to make a simple electric carousel toy. <a href="http://www.youtube.com/watch?v=QfEQOvEJ2uM">www.youtube.com/watch?v=QfEQOvEJ2uM</a></li> <li>- Make notes of the planning and design process</li> </ul>	<p>Discussion: In what ways could we strengthen the carousel ride? What materials would have improved the finished product? Are you pleased with design aspect of the ride? <b>Evaluate your ride.</b></p> <p><u>Place finished fairground rides on display in the classroom.</u></p>	<ul style="list-style-type: none"> <li>• I can design and plan a fairground ride.</li> <li>• I can make a fairground ride using different tools and materials</li> <li>• I can make improvements to my fairground ride.</li> <li>• I can evaluate my fairground ride.</li> </ul>
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switches, bulbs, buzzers and motors) .  L.O. 11: To be able to apply their understanding of computing to program, monitor and control their products.				
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