



## Year 2 Medium Term Planning for the Learning Challenge Curriculum

Term: Spring

DT Project: Raisin Box Racers

<u>Previous Learning</u>	<u>New Knowledge /Consolidation</u>	<u>End of Project Outcome</u>	<u>Environmental Links</u>	<u>Key Inventors/People</u>	<u>Project Vocabulary</u>
Created a rolling toy with a fixed axle. Explored how wheel position & quantity effects movement.	Consideration of the size and position of elements that make up a moving axle.	To create a car, with a spinning axle, that can be either pulled or pushed.	Discuss where to implement the use of recycling. Compare materials used and their green credentials compared to their functionality (e.g. paper vs. plastic).	N/A	Explore, Compare, Risk & Safety Plan, Choose & Design Build & Construct Attach & Join Cut & Trim Equipment & Tools Strengthen & Stable Axle Change & Improve

Section	Lesson	Key Skills	Learning Objective & Activity
Explore	1	<ul style="list-style-type: none"> <li>Explain the purpose of a product, how it will work and how it will be suitable for the user.</li> <li>Talk about existing products considering: use, materials, how they work, audience, where they might be used; express personal opinion</li> <li>Evaluate how good existing products are</li> <li>Identify and name the mechanism being used</li> </ul> <ul style="list-style-type: none"> <li>Explain what they want to do and describe how they may do it</li> <li>Use knowledge of existing products to</li> </ul>	<p><b><u>To investigate how the size &amp; position of wheels effects how effectively a toy moved.</u></b>            Use a variety of different toy vehicles on the Beebot mats to investigate how easy they are to push (variation to be greater than those used for the rolling toy).            Discuss what toys were easier to move and why – look at wheel position, number of wheels and wheel size.</p> <p><b><u>To investigate how materials, combine to create an axle that spins.</u></b>            Discuss how an axle is created. Discuss how the model will work and be suitable for the user (linked to the aim to create a moving axle).</p> <p>Explore materials used to create an axel (light axel – kebab sticks and milk tops, heavy axel – dowels and plastic wheels). Discuss the advantages and disadvantages.            Pass round examples &amp; mind map observations.</p>

		<p>produce ideas</p> <ul style="list-style-type: none"> <li>• <b>Choose the best tools and materials, and explain choices (class discussion)</b></li> </ul>	<p><i>Alternatives: Discuss the advantages and disadvantages of using plastic or paper straws and wooden dowels, wooden (skinny) wheels or cotton reel (fat) wheels.</i></p>
<b>Plan</b>	<b>2</b>	<ul style="list-style-type: none"> <li>• Have their own ideas and plan what to do next</li> <li>• Explain what they want to do and describe how they may do it</li> <li>• Describe a design using <b>pictures</b>, words, models, <b>diagrams</b> and simple ICT design</li> <li>• Design products following a design criterion</li> <li>• Use knowledge of existing products to produce ideas</li> <li>• <b>Choose the best tools and materials, and explain choices (class discussion)</b></li> </ul>	<p><b><u>To consider which materials to use to create a moving car.</u></b> Use a printed handout to identify which materials will be used to create their car.</p> <p>Introduce concept of “Raisin Box Racer” – Key Question: Would the shape make a difference?</p> <p>Introduce design criterion:</p> <p>YOUR RAISIN BOX RACER MUST HAVE ... (PPT slide)</p> <ul style="list-style-type: none"> <li>➤ Wheels</li> <li>➤ A raisin box cabin</li> <li>➤ Straws to hold your axel</li> </ul> <p>Use planning sheet in pairs to</p> <ul style="list-style-type: none"> <li>• Identify materials for axel</li> <li>• Alter base shape</li> <li>• Position driver’s cabin/raisin box</li> </ul> <p>List of materials will be based on those available at the Discovery Museum – Stephenson’s Rocket Steam Engine Workshop.</p> <ul style="list-style-type: none"> <li>• Wheels – Wooden wheels, cardboard wheels or plastic cotton reels.</li> <li>• Axle – Metal split pins or wooden dowels (thick or thin)</li> <li>• Body – Tin tray, cardboard tech card, paper cup.</li> <li>• Accessories – Pipe cleaners, paper, card.</li> </ul> <p>Move images to indicate the position and number of wheels on the engine.</p>

			Class discussion on the choices they want to make and why (linked to axle position, wheel quantity and the properties of the available materials).
<b>Make</b>	<b>3&amp;4</b>	<ul style="list-style-type: none"> <li>• Begin to use spinning axels with support</li> <li>• Measure materials</li> <li>• Use joining, layering, rolling or folding to make it stronger</li> <li>• Identify and name the mechanism being used</li>   <li>• Try to use finishing techniques to make product look good.</li> </ul>	<p><b><u>Make a moving axle that can be either pushed or pulled.</u></b>  Measure and cut materials (with support), combining straws, kebab sticks and milk tops and/or dowels and wheels or cotton reels to create an axle.  Shape the base &amp; add/position a raisin box cabin following the plan created previously.  Strengthen using different tape (initially masking tape followed by parcel tape) and discuss possible solutions to fix the wheels to the axel if they become loose (e.g. adding blue tac, glue and/or pipe cleaners).</p> <p>Explore different mechanisms from other year groups, previous projects &amp; example pieces (wind up, balloon powered, pull back, hydraulic, electric motor (including solar) and discuss how spinning axels allow the above + push and pull (unlike the fixed axel produced in the rolling toys in year 1).</p> <p>As a class, discuss the tools we have used and why? – mind map.</p> <p>Discuss how to make the car look better and (if time allows) apply techniques to do so (e.g. tape to hide joins, adding a stick or string to aide movement, adding a design).</p>
<b>Evaluate</b>	<b>5</b>	<ul style="list-style-type: none"> <li>• Explain what they are making and why it fits the purpose</li> <li>• Describe what went well, thinking about design criteria</li> <li>• Talk about what I would do differently if I were to do it again and why</li> </ul>	<p><b><u>To consider what went well and what could make the model better.</u></b>  Class discussion. What went well and how could we improve our racers?  Class discussion and teacher add list to pre-prepared evaluation sheet (PPT).</p> <p>Was it fit for purpose and why?  What did we make in this project? As a class discuss what we achieved and add their own sentence to explain this.</p> <p>Move and delete auto shapes to indicate if the racer rolled – smiley face or cross.</p> <p>Insert an image of the completed racer.</p>

			Use teacher PowerPoint slide to revisit key terms from pacer planning document.
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