



Year 5 Medium Term Planning for the Learning Challenge Curriculum

Term: Spring

DT Project: CAM Toy

<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>
<p>Creating movement within a 2D format using sliders to create a moving picture (simple lever mechanism). Moving/lifting objects using pulleys.</p>	<p>Measuring and shaping wooden dowels (moving from card to wood) with growing accuracy in order to connect pre-cut CAMs. Moving/lifting objects using CAMs.</p>	<p>Creating a basic cam toy (building of shaping and joining card to create movement – lift rather than slide) & lifting objects in different ways (pulley vs. CAM).</p>	<p>N/A</p>	<p>Google Challenge What is the oldest mechanical toy? Use Google to investigate the oldest mechanical toy – mind map on PowerPoint. <i>(One of the first mechanical toys is the flying pigeon by Archytas of Tarentum created 400 years BC. In 16th Century Leonardo da Vinci created his mechanical lion as a present for king Louis XII).</i></p>	<p>Hazard Cross Section Develop Variation Specification Combining Support Manoeuvrability Cam, Handle, Follower, Slider & Cam Shaft Analyse Finish Fit for purpose</p>

Section	Lesson	Key Skills	Learning Objective & Activity
Explore	1	<ul style="list-style-type: none"> ● Use research for design ideas ● Explore some key inventors/designers/ engineers/ chefs/manufacturers of ground-breaking products and the impact this has had on the evolution of the product. ● Evaluate and discuss existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose. ● Clearly explain how parts of product will work. 	<p><u>To investigate how different components, alter the movement of a CAM toy.</u> Introduce how a CAM toy works using key parts (follower, CAM & crank) – BBC Bitesize slides used to support discussion. Explore real world examples, focusing on where the elements attach. Allow the children to explore (wooden & card) – discuss the advantages of using different material e.g. card= light, easy to manipulate and shape; wood = strong.</p> <p>Watch Art and Design / DT KS2: How to design a moving shop window display: https://www.bbc.co.uk/teach/class-clips-video/design-challenge-make-moving-shop-window-display/z7ytscw. Explore how different shapes result in different movement (circle, pair, snail, heart)</p> <p>Challenge: What is the oldest mechanical toy? Use Google to investigate the oldest mechanical toy – mind map on PowerPoint. <i>(One of the first mechanical toys is the flying pigeon by Archytas of Tarentum created 400 years BC. In 16th Century Leonardo da Vinci created his mechanical lion as a present for king Louis XII).</i></p>

<p>Plan</p>	<p>2</p>	<ul style="list-style-type: none"> • Make design decisions considering time and resources. • Use computer-aided designs as part of the planning process • Clearly explain how parts of product will work. • Use research for design ideas. • Select and use Cams to create a pre-planned movement based on their size and shape. 	<p>What is the purpose of a CAM toy? Class discussion</p> <p>Based on the moving shop window display & BBC Bitesize slides, create a design criterion as a class – What does our CAM toy need?</p> <p>Make design choices based on the desire other others in the class. Make design choices to create a CAM toy that moves in a pre-planned way. What does your partner want? Discuss what type of movement and design that both members of the team are happy with.</p> <p>Use Google images to locate a character (with white background) and save to Shared.</p> <p>PAIRED TASK - Create a plan on PPT (Use computer-aided designs as part of the planning process) selecting:</p> <ul style="list-style-type: none"> • The cam shape (explain how the character will move based on explore). • Add an image of the character to be moved. • Consider and add a possible material to be used as a base (e.g. teabag box, pringles tub, cracker box, cereal bar box).
<p>Make</p>	<p>3 & 4 (double lesson)</p>	<p>MAKE</p> <ul style="list-style-type: none"> • Begin to use cams to create movement, with support. • Mainly accurately measure, mark out, cut and shape materials and components to increase precision. • Mainly accurately assemble, join and combine materials and components using different methods (screwing, nailing, hammering, cutting). • Reinforce and strengthen using different materials and techniques. • Mainly accurately apply a range of finishing techniques • Begin to be resourceful with practical problems • Select appropriate tools and equipment. • Select appropriate materials. 	<p><u>To measure, cut and position wooden dowels to create movement.</u> Measure the base and select appropriate wooden dowels to fit the width and height of the box.</p> <p>Cut base material (box), measure and mark out points for the cam shaft. Insert Cam & follower. Use pre-cut CAMs and connect to the dowels, using trial and error testing to position (evaluate position and shape of components, with reference to planning, and alter if necessary).</p> <p>Cut out and attach their character.</p> <p>Construct a handle by combining the strengthening - (peg, wire, tape, dowels & pipe cleaners). How could we strengthen and finish the connections? Combine materials (e.g. tape, pipe cleaners, bluetac, rubber washers) to strengthen the connections and add finishing techniques to hide joins.</p> <p>Class discussion: What problems did we have and how were they solved practically during the make? (Mind map).</p>

		<ul style="list-style-type: none"> Select and use Cams to create a pre-planned movement based on their size and shape. 	
Evaluate	5	<ul style="list-style-type: none"> Test and evaluate final product Evaluate ideas and finished product against specification (planning), considering purpose and appearance. 	<p><u>To reflect on the planning and add comments about what was changed and what could be improved.</u></p> <p><u>To reflect on the planning and add comments about what was changed and what could be improved.</u></p> <p>Test CAM toy and revisit previous planning in pairs (PowerPoint). Upload a photo of the completed cam (Seesaw) & add comments to evaluate if the planning was followed and if the CAM toy was a success (based on the design criteria). Planning open on PC 1 and evaluation open on PC 2.</p> <p>What would you change about the project? How could we improve the way it looks? Create a class mind map.</p> <p>Add a paragraph outlining if their toy was fit for purpose & why and how they would improve the appearance/finish (based on the points documented in the mind map).</p> <p>Revisit key question: What problems did we have and how were they solved practically during the make? (Mind map).</p>

Substantive Knowledge	Disciplinary Knowledge
------------------------------	-------------------------------