

Y4 – D&T – Cam Mechanisms

Inspiration Creativity -		Partnership with parents Community	
Key Questions		Key concepts	
Design		- Mechanisms (a cam toy)	
<ul style="list-style-type: none"> - How does a cam work? - How does the shape of a cam effect the movement? - How have other designers used cam mechanisms? - How can we effectively incorporate a cam mechanism into our design for a toy? 		Skills	
Make		<ul style="list-style-type: none"> - Generally, there is a good understanding of opportunities for design. - Planning of work flows and careful selection of materials mean work is generally carried out efficiently. - Generally, designs are evaluated and refined throughout a project. - Appropriate tools are generally chosen to safely cut out materials. - There is generally accurate measurement and marking to the nearest millimetre. - Appropriate techniques are generally chosen to cut and shape materials. - Appropriate joining techniques are generally selected and used well. - A growing knowledge of a range of notable designers is used to provide inspiration for designs. 	
Evaluate		By the end of this unit, children will be able to:	
<ul style="list-style-type: none"> - How can I improve my design as I develop my product? - What might I do differently next time? - How could I improve my design? 		<ul style="list-style-type: none"> - Understand how cams work - Apply this knowledge to a create an effective moving toy with appropriate motion - Apply measuring and cutting with a high degree of accuracy - Evaluate and refine a design to improve the quality 	
Knowledge			
<ul style="list-style-type: none"> - A cam and follower mechanism is a shape on a shaft that causes a follower to move. - Cams convert rotatory to linear motion. - As cams rotate the follower rises up and down in a process known as reciprocating motion. - The followers needs to be in direct contact with the cam. - The shapes of the cams are designed to produces specific types of motions. For example – Pear shaped cams will lift and fall then pause before repeating the action. Circular cams will cause smooth rise and fall with no pause. - Cams are used in engines to control valves, in children’s toys, wall clocks, food processors and printing presses. 			
Topic Specific Vocabulary		NC Subject content	
Cam, mechanism, follower, shaft, reciprocating motion, rotatory motion, linear motion,		<ul style="list-style-type: none"> - Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individual’s groups - Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design - Select from and use a wider range of tools and equipment to perform practical tasks - Select from and use a wider range of components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities - Investigate and analyse a range of existing products - Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work - Apply their understanding of how to strengthen, stiffen and reinforce more complex structures. - Understand and use mechanical systems in their products. 	
Subject Specific/Academic Vocabulary			
This vocabulary should be explicitly taught in context. Other tier 2 words should also be explored as they are encountered.			
Year 3	Year 4	Year 5	Year 6
Appropriate, features, specific, concept, range, sequence, structure	Economic, identified, potential, procedure, process, variables	Affect, analyse, criteria, demonstrate, specify	Technique, component, justify, outcome
We are Product Designers/Being a Product Designer/I am a Product Designer (entrepreneur)			
Design and make a moving toy incorporating an effective cam mechanism.			