



St John Vianney Catholic Primary School



What I am Learning in

D&T this Term...

Year 6: Mechanical systems-Pulleys or Gears

Topic Overview – Lesson Objectives

Lesson 1	Investigate, analyse and evaluate existing everyday products and toys that incorporate gear or pulley systems. Look at videos and photographs of products too. Use observational drawings and questions to develop understanding of the products, e.g., 'How innovative is the product?' 'How well does the product work?' Research manufacturing companies such as JCB.
Lesson 2	Using a construction kit, investigate combinations of two different sized pulleys to learn about direction and speed of rotation, e.g., 'Do the pulleys move in the same direction?' 'How can you reverse the direction of rotation?' Explore combinations of two different sized gears meshed together. Build a working circuit that incorporates a battery, a motor and a handmade switch such as a reversing switch. Draw a pictorial representation of the circuit.
Lesson 3	Design a product in a context that is authentic and meaningful, carefully considering the purpose and intended user for the product. Communicated ideas through detailed, annotated drawings and diagrams. Show the design decisions made, including the location of the mechanical and electrical components, how they work as a system with an input, process and output, and the appearance and finishing techniques for the product. Make lists of tools, equipment and materials needed. Blackpool trams – how are they made?
Lesson 4	Make a high-quality product, selecting and from and using a range of tools and equipment to make a product that is accurately assembled and well finished. Consider time, resources and cost.
Lesson 5	Finish making the product, using a range of decorative finishing techniques to ensure a well finished product that matches the intended user and purpose.
Lesson 6	Evaluate the final product considering the design, manufacture, functionality, innovation shown and fitness for the intended user and purpose. Consider the views of others to improve your work.

Assessment – National Curriculum

NC Statement	Maths/Literacy opportunity	Child led enquiry
<p>Design</p> <p>*Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups.</p> <p>*Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.</p> <p>Make</p> <p>*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>*Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities.</p>	<p>Understand ratios. Apply understanding and skill to carry out accurate measuring using standard units, i.e., cm/mm.</p> <p>Spoken language-ask relevant questions formulate and express opinions, give well-structured descriptions and explanations. Used relevant strategies to build vocabulary.</p>	<p>How well do the products work?</p>

Evaluate

*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.

*Understand how key events and individuals in design and technology have helped shape the world.

Technical knowledge

*Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.

*Understand and use mechanical systems in their products (pulleys and gears).

*Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors].

Topic Vocabulary

pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor, circuit, switch, circuit diagram, annotated drawings, exploded diagrams, mechanical system, electrical system, input, process, output, design decisions, functionality, innovation, authentic user, purpose, design specification, design brief