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| **Year:** 5 **Program of Study:** Mechanical systems – Pulleys or gears  **N.C POS:**   * *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.* * *Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams and prototypes.* * *Select from tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] accurately.* * *Investigate and analyse a range of existing products.* * *Evaluate their ideas and products against their own design criteria.* * *Understand and use mechanical systems in their products [for example gears, pulleys, cam, levers and linkages].*   **Concept:** technology, impact, legacy, change, inventions, innovation, application, application, cause and effect.  **Key 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.  **Prior Learning:** Experience of axles, axle holders and wheels that are fixed or free moving. Basic understanding of electrical circuits, simple switches and components. Experience of cutting and joining techniques with a range of materials including card, plastic and wood. An understanding of how to strengthen and stiffen structures.  **Future Learning : (KS3)**  understand how more advanced mechanical systems used in their products enable changes in movement and force |
| **Core Knowledge- non-negotiable**  **Exploring**   * Explore a variety of images/objects that use gears or pulleys- what is the function of gears and pulleys in these mechanical systems? To make work easier e.g. pulley in a well, crane, fishing rod, non-digital clock, bike. Similarities/Differences between the two. Work out which mechanism each object uses and what the effect is? Experiment creating a pulley using simple designs e.g. A pulley system to move a marble in a plastic cup from one table to another.   **Designing**   * Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources. * Develop a simple design specification to guide their thinking. * Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views.   **Making**   * Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team. * Select from and use a range of tools and equipment to make products that are accurately assembled and well finished. Work within the constraints of time, resources and cost.   **Evaluating**   * Compare the final product to the original design specification. * Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. * Consider the views of others to improve their work. * Investigate famous manufacturing and engineering companies relevant to the project. |
| **Wider Influences**   * Festivals * Celebrations * Travel and tourism * Mini-enterprise * Forces and motion * Outdoor adventure * Toys and games * Our community |
| **Enduring Understanding**   * Understand that mechanical and electrical systems have an input, process and an output. * Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement. * Know and use technical vocabulary relevant to the project. |