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| **Year:** 3 **Program of Study:** Mechanical systems – Levers and linkages.  **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, cause and effect.  **Key Vocabulary:** mechanism, lever, linkage, pivot, slot, bridge, guide, system, input, process, output, linear, rotary, oscillating, reciprocating, user, purpose, function, prototype, design criteria, innovative, appealing, design brief.  **Prior Learning: Year 1 – Exploring sliders and levers.** Explored and used mechanisms such as flaps, sliders and levers. Gained experience of basic cutting, joining and finishing techniques with paper and card. Toys over time.  **Future Learning: Year 5**- **Mechanical Learning: Pulleys and Gears.** Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement. |
| **Core Knowledge- non-negotiable**  **Explore:**   * Investigate and analyse books and, where available, other products with lever and linkage mechanisms e.g- storybooks connected with class reading books, information books with a Science link. Ask different questions to develop the children’s understanding- ***Who might it be for? What is its purpose? What do you think will move? How will you make it move? What part moved and how did it move?***   **Designing**   * Generate realistic ideas and their own design criteria through discussion, focusing on the needs of the user. * Use annotated sketches and prototypes to develop, model and communicate ideas.   **Making**   * Order the main stages of making. * Select from and use appropriate tools (scissors, masking tape, paper fasteners, card drill, cutting mat) with some accuracy to cut, shape and join paper and card. * Select from and use finishing techniques suitable for the product they are creating.   **Evaluating**  Evaluate their own products and ideas against criteria and user needs, as they design and make. This needs to be an ongoing process at the different stages of both the design and making of the product. Assess children’s understanding through focused questions- ***Which card strip is the lever?******Which card strip is acting as the linkage? Which part of the system is the input and which part the output? What does the type of movement remind you of? Which are the fixed pivots and which are the loose pivots?*** |
| **Wider Influences**   * Widening the range of materials (plastic, wood etc). * Understand how to strengthen and stiffen structures making mock-ups using different material types. * Generate innovative ideas by carrying out research using surveys and questionnaires (these will need to be catered the age of the children) * Consider the views of others to improve work- peer assessment from both their own and other classes. * Investigate famous manufacturing and engineering companies relevant to the project. * Festivals and celebrations- greeting cards, Christmas cards. * Favourite books- pop-up books to support learning of different subject areas. * History-based topic- information books, interactive posters. * Geography-based topic- class displays. * Science-based topic- different parts of a flower, phases of the moon. |
| **Enduring Understanding**   * Understand and use lever and linkage mechanisms. * Distinguish between fixed and loose pivots. * Know and use technical vocabulary relevant to the project. |