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| **DT Year 4 Mechanisms Block B** | | |
| **National Curriculum**   * Design design purposeful, functional, appealing products for themselves and other users based on design criteria generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology. * Make select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics. * Evaluate explore and evaluate a range of existing products evaluate their ideas and products against design criteria Technical knowledge build structures, exploring how they can be made stronger, stiffer and more stable explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products. | | |
|  | Lesson 1 | Lesson 2 |
| **Learning intention** | How can a a model Ferris wheel be designed and powered by gears? | How can a a model Ferris wheel be designed and powered by gears? |
| **Skills taught** | Can make accurate measurements of force and use these results to conclude that compound pulleys require the least amount of effort to lift a load. | Can apply knowledge of gears to design and construct a Ferris wheel model  Can use simple tools and modelling materials safely and with accuracy. |
| **Recall and retrieval** | A pulley is a grooved wheel around which a cord or belt is passed which can be used to lift heavy loads  Two connected pulleys will rotate in the same direction, forming a figure of eight - the band attaching them makes them rotate in opposite directions  Pulley systems are used to lift heavy loads with little effort Pulleys are used to transfer rotational movement Speed of movement can be changed by altering the size of pulley wheels | Gears are toothed wheels on a shaft that when placed together are used to transfer rotational movement  A small gear wheel will rotate faster but with less force than a larger gear wheel  Two connected gear wheels will rotate in opposite directions  A driver wheel causes other wheels to rotate  An idler gear is used for support or guidance instead of power transmission  A gear train is a system of gears which transmits motion from |
| **Sequence of knowledge throughout the lesson** | **Key knowledge**  Can name types of pulleys and describe the difference between fixed, movable and compound pulleys  Can identify everyday uses of pulleys, such as lifting heavy loads.  Can make links between the amount of string that needs to be pulled with the height that a weight is lifted  Can draw conclusions from experimentation and explain results | **Key knowledge**  Can use the correct technical vocabulary to identify types of gears: spur, worm, driver, driven and idler  Can recall, from prior learning, how a simple gear train works  Can explain how the size of gear wheel used affects the speed in which it makes one complete rotation  Can explain how speed of rotation can be stepped up or stepped down  Can identify that adjacent gears rotate in opposite directions  Can identify the movements involved in a rack and pinion system |
| **Scaffolding** | Visual steps to success. | Working examples.  Visual steps to success. |
| **Challenge** |  |  |
| **Key Vocabulary** | Pulley  Movable pulley  Fixed pulley  Block and Tackle  Rack and Pinion  Driver gear  Driven gear | Pulley  Movable pulley  Fixed pulley  Block and Tackle  Rack and Pinion  Driver gear  Driven gear |