**Year 4 Design and Technology Curriculum – Summer Term**

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| **Theme: Mechanical systems - Pneumatics** | | | | | | | |
| **Curriculum objectives** | | | **Vocabulary** | | | | **Links across the curriculum** |
| • Investigate and analyse books, videos and  products with pneumatic mechanisms.  **Designing**  • Generate realistic and appropriate 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 with some  accuracy to cut and join materials and  components such as tubing, syringes and  balloons.  • 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.  **Technical knowledge and understanding**  • Understand and use pneumatic mechanisms.  • Know and use technical vocabulary relevant to the project | | | **Keyword** | Definition | **Keyword** | Definition | **Science** – make systematic and careful observations. Compare the suitability of everyday materials for particular uses.  **Art and design** – use and develop drawing skills. Use colour, pattern, texture and shape.  **Spoken language** – ask relevant questions to build understanding and their vocabulary.  **Mathematics-** measuring, volume and capacity |
| Compressed | Something that is squashed, such as air in a tube | System | A set of related parts used to create an outcome |
| Input | What goes into a system |  | . |
| Output | What comes out of a system |  |  |
| Pneumatic | A system that works using gases (air) |  |  |
| Pressure | The force used on an object or surface. |  |  |
| **Prior knowledge:** *What specifically have pupils learned that is relevant to this unit that they are building upon?* | | | | | **Future knowledge:** *What specifically will pupils learn in the future that is relevant to this unit?* | | |
| Explored simple mechanisms, such as sliders and levers, and simple structures. Learnt how materials can be joined to allow movement. Joined and combined materials using simple tools and techniques (Year 3). | | | | | Use cam, gears and pulley mechanisms. | | |
| **Lesson Sequence** | | **Key Knowledge** | | | | **Key Skills** | |
| 1. To investigate familiar objects that use air to make them work. | | * Everyday objects use air to make them work e.g. bicycle pumps, balloons, swimming aids, foot pumps. | | | | * Investigation, dissembling skills | |
| 1. Ton investigate how to assemble systems using syringes and tubing. | | * Know one syringe (connected to another one via tubing) can move the plunger on the other syringe using the force of air. | | | | * Investigation skills | |
| 1. To design a pneumatic system for a product. | | * How the pneumatic system will work in the product. What the product will look like and which materials will be required. | | | | * Creative thinking. * Drawing and labelling skills | |
| 1. To make a pneumatic product. | | * How to construct the materials chosen to make the pneumatic product. Refine their design as they work (iterative process). | | | | * Construction skills | |
| 1. To evaluate their pneumatic product. | | * What worked well in their design and make project and what areas could be improved. | | | | * Evaluation skills. * What went well … Even better if… | |
| **Themes and links** | | | | | | | |
| **Themes** | **Where these are covered:** | | | | | | |
| **Investigate** | * Lesson 1, 2 | | | | | | |
| **Design** | * Lesson 3 | | | | | | |
| **Make** | * Lesson 4 | | | | | | |
| **Evaluate** | * Lesson 5. How effective is the product? | | | | | | |