

Medium Term Plan – Design Technology - Mechanical systems – pneumatics

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: Compressed, input, output, pneumatic, hydraulic, pressure, inflate, deflate, syringe, system, purpose, function, prototype, design criteria, innovative, appealing, design brief.

Prior Learning: 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.

Future Learning – Pulleys and Gears Y5

Core Knowledge- non-negotiable

Explore

- Children investigate, analyse and evaluate familiar objects that use air to make them work e.g. bicycle pump, balloon, inflatable swimming aids, foot pump for inflating an air bed. What does the air do? How has it been used in the design of these products? How can air be used to move heavy objects?
- Demonstrate lifting an object and ask the children to think about ways in which this might be used in a product. Who might it be for? What is its purpose? What part moved and how did it move? What materials have been used? How effective do you think it is and why? What else could move?

Designing

- Investigate and analyse books, videos and products with pneumatic mechanisms.
- Generate realistic and appropriate ideas (Moving monsters – with or without balloon, Bridge) 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.
- Mock ups using art straws, lolly sticks (bridge) or egg boxes (monster) to design how to use syringes effectively.

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.
- Evaluate products based on user and purpose, thinking about what has worked well and what improvements were needed.

Wider Influences

- Toys and Games – Jack in a box, moving monsters, hydraulic bridge for toy cars
- Our Community – drills in construction, fire extinguisher
- Forces and Movement
- Mini-enterprise – Sell toys (monsters) to community as project.
- Future jobs – Pneumatic technician (designer, maintenance)

Enduring Understanding

- Understand and use pneumatic mechanisms.
- Know and use technical vocabulary relevant to the project