

Topic: Mechanisms	Year group	Term
Pneumatics Moving Monsters	Year 5	Summer 1 6 sessions

Background knowledge

Pneumatics are engineering systems using water or air pressure to make a part of the product move. It works by pushing air or water up through a tube, which would in turn inflate a balloon or force another part to move. This is another type of mechanism following on from levers and linkages in year 3.

What should I already know?

Levers and linkages can be used to make parts of a product move.

Materials can be cut, shaped and joined using a variety of tools and methods.

Knowledge of how forces make things move/stay still (science)

To create a successful product they will need to follow a design brief and design process.

National Curriculum Objectives / Key Skills	The Journey
<p>Design</p> <ul style="list-style-type: none"> 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. <p>Make</p> <ul style="list-style-type: none"> Select from and use a wider range of tools and equipment to perform practical tasks, such as cutting, shaping, joining and finishing, accurately Select from and use a wider range of materials and components, including construction materials, according to their functional properties and aesthetic qualities <p>Evaluate</p> <ul style="list-style-type: none"> Investigate and analyse a range of existing products Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work <p>Technical knowledge</p> <ul style="list-style-type: none"> Apply their understanding of how to strengthen, stiffen and reinforce more complex structures Understand and use mechanical systems in their products, (for example as gears, pulleys, cams) <ul style="list-style-type: none"> I can research and evaluate existing products, collecting information about the audience. I can develop design criteria within a group to suit the purpose and audience of a product. I can produce a detailed step by step plan including a cross-sectional diagram/an exploded diagram. 	<ol style="list-style-type: none"> Research how pneumatics are used in daily life. (bike pumps, foot pumps, use in medicine/on vehicles, braking systems on large vehicles). Plan design criteria for the product for a specific audience, based on research. Experiment with a pneumatics. Design a product based on the design brief and communicate using an exploded diagram. To create a detailed step by step plan/flow chart to describe how they will make the product. Make the product Complete product Evaluate based on design criteria, receive peer feedback and suggest improvements.

- I can make a product that uses a mechanical system (Pneumatics)
- I can show that I can work safely and independently with a range of tools and materials.
- I can evaluate my structure against the original criteria, give and receive peer feedback to suggest improvements

Outcomes

An overview of what children will know / can do

Working towards: I can use a pneumatic system to make a part of a product move.

Expected: I can design an appealing product for a specific audience that uses a pneumatic system.

Exceeding: I can think of ways to further extend my product using another mechanism.

Key Vocabulary

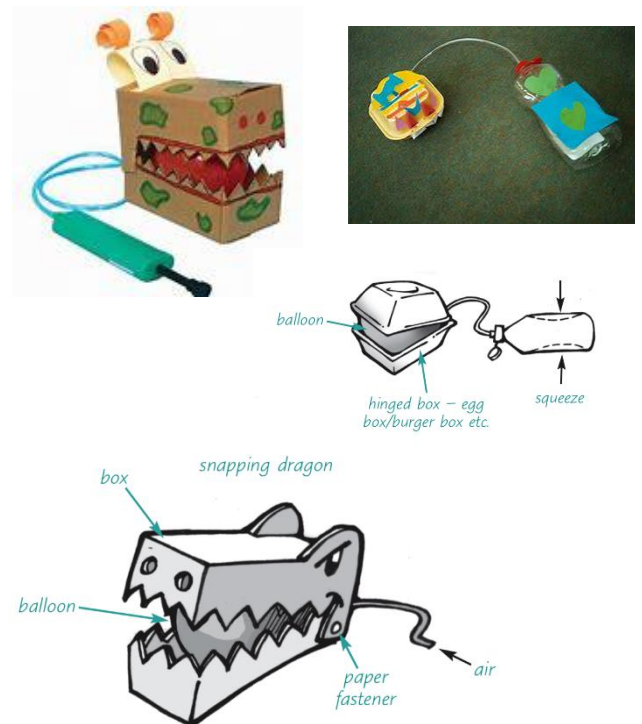
Pneumatics- a system using compressed air or water to make something move.

Syringe- A simple pump using a plunger and tube to move air or liquid.

Forces-

Exploded diagram- a labelled diagram that shows the components of an object slightly separated by distance, or suspended in surrounding space

Timeline / Diagrams



Key people / places

Assessment questions / outcomes

Can you tell me what a pneumatic system is?

How is your product going to be suitable for your audience?

Did your product meet the design criteria?

What could you do to improve your product and why? How could you make those improvements?