

Subject: DT  
 Year group: 4  
 Term: Autumn  
 Unit name: Mechanical systems-  
 Pneumatics

- National curriculum**
- Design- use research and develop design criteria to inform the design of innovative, functional appealing products that are fit for purpose
  - Make- select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities
  - Evaluate- evaluate their products against their own design criteria and consider the views of others to improve their work
  - Understand and use mechanical systems in their products

- Prior Knowledge –**
- 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.

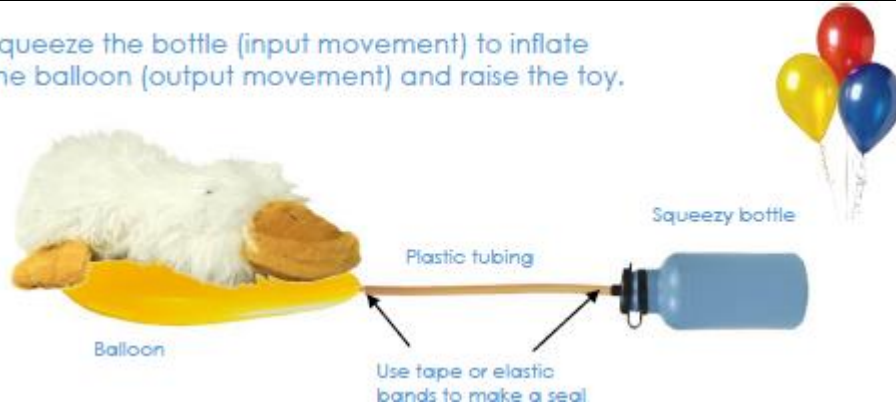
<b>Design Process</b>	<b>Spiritual Development</b> 2PE 1:12 Therefore, I will always be ready to remind you of these things, even though you already know them, and have been established in the truth which is present with you.
Investigative and Evaluative Activities (IEAs)	
Focused Tasks (FTs)	
Design, Make and Evaluate Assignment (DMEA)	

**Key vocabulary**

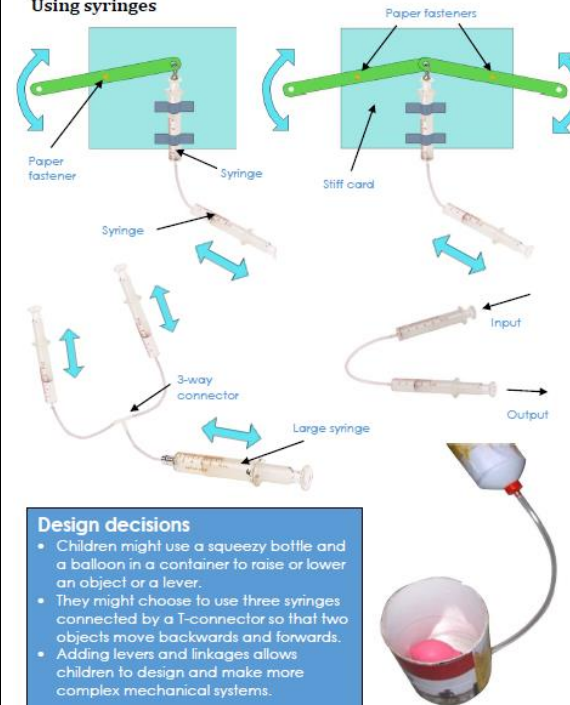
Components	pump
Fixing	seal
Attaching	air-tight
Tubing	linear
Syringe	rotary
Plunger	oscillating
split pin	reciprocating
paper fastener	user
pneumatic system	purpose
input movement	function
process	prototype
output movement	compression
control	pressure
evaluate	inflate
ideas	deflate
constraints	design criteria
investigate	innovative
design brief	appealing
research	

**Teaching aids to demonstrate pneumatic systems**

Squeeze the bottle (input movement) to inflate the balloon (output movement) and raise the toy.



**Using syringes**



**Design decisions**

- Children might use a squeezy bottle and a balloon in a container to raise or lower an object or a lever.
- They might choose to use three syringes connected by a T-connector so that two objects move backwards and forwards.
- Adding levers and linkages allows children to design and make more complex mechanical systems.

**Key Learning- what will the children know by the end of the unit?**

How to explore 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.

Children are able to construct a simple pneumatic system by joining a balloon to 5mm tubing and then to a washing-up liquid bottle and explore how it functions.

Children can explore, learn how to assemble, draw and decide on 3 different pneumatic systems:

- balloon connected to a washing-up liquid bottle
- two syringes of the same size connected together
- two syringes of different sizes connected together.

Children are able to correctly and accurately measure, mark out, cut, join and finish their product and evaluate their product against the design criteria.