

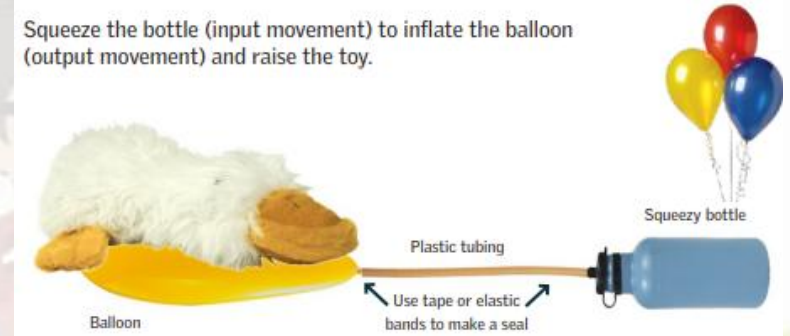


Year group: Year 4
Term: Summer
Subject: Design Technology – Mechanisms –
Pneumatics – Moving Toy

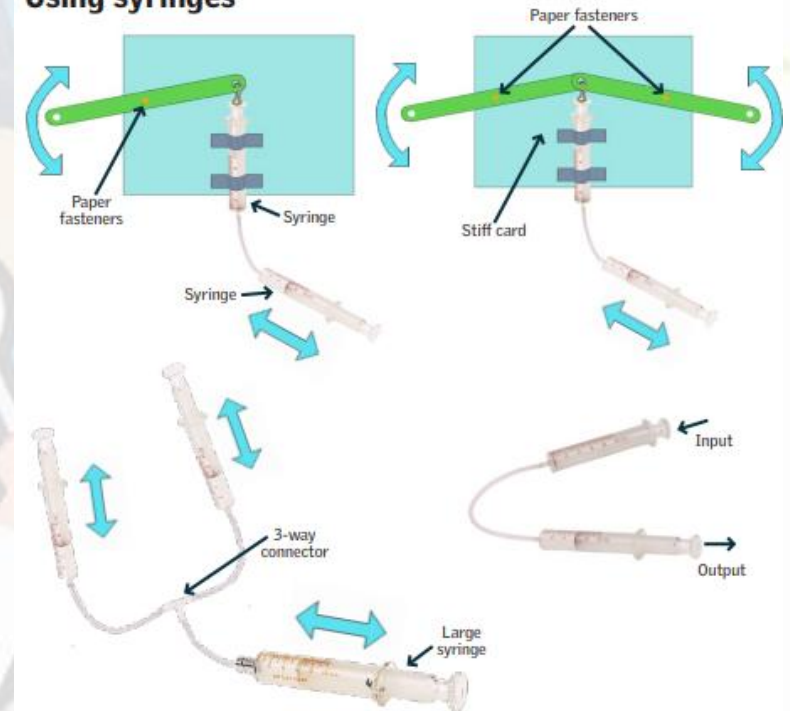
Key vocabulary
Pneumatic System Inflate/deflate Compression Pump

Teaching aids to demonstrate pneumatic systems

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



Using syringes



Prior learning

EYFS

Early experiences of working with paper and card to make simple flaps and hinges. Experience of simple cutting, shaping and joining skills using scissors, glue and masking tape

Year 3 – Levers and linkages

The children will have experience of a range of lever and linkage mechanisms. They will be taught the correct and accurate use of measuring, marking out, cutting, joining and finishing skills and techniques.

What comes next?

Year 5 – Pulleys or Gears

The children will have experience of two different sized pulleys to learn about direction and speed of rotation or they will have explored combinations of two different size gears meshed together; Investigating the direction and speed of rotation focusing on how the size of the driver gear affects the speed of the follower gear.

Notes and guidance

Demonstrate how to assemble the systems using syringes, tubing, balloons and plastic bottles.

Introduce ways in which pneumatic systems can be used to operate levers.

Demonstrate the correct and accurate use of measuring, marking out, cutting, joining and finishing skills and techniques.

Provide the materials and ask the children to try out and draw the three systems they have been shown: a) Balloon connected to a washing-up liquid bottle. What happens when you squeeze the bottle? What happens when you let go? b) Two syringes of the same size connected together. What happens when you press the plunger of one syringe down? How far does the other syringe move? c) Two syringes of different sizes connected together. How far do these syringes move when pressed?

Note: take care as the syringe may come out with force.

Substantive Knowledge

To know, understand can use pneumatic systems.
I know the terminology related to pneumatic systems.

Disciplinary Knowledge

To know that designers generate realistic and appropriate ideas and their own design criteria through discussion, focusing on the needs of the user
To know that designers evaluate their work to ensure it is fit for purpose.

Procedural Knowledge

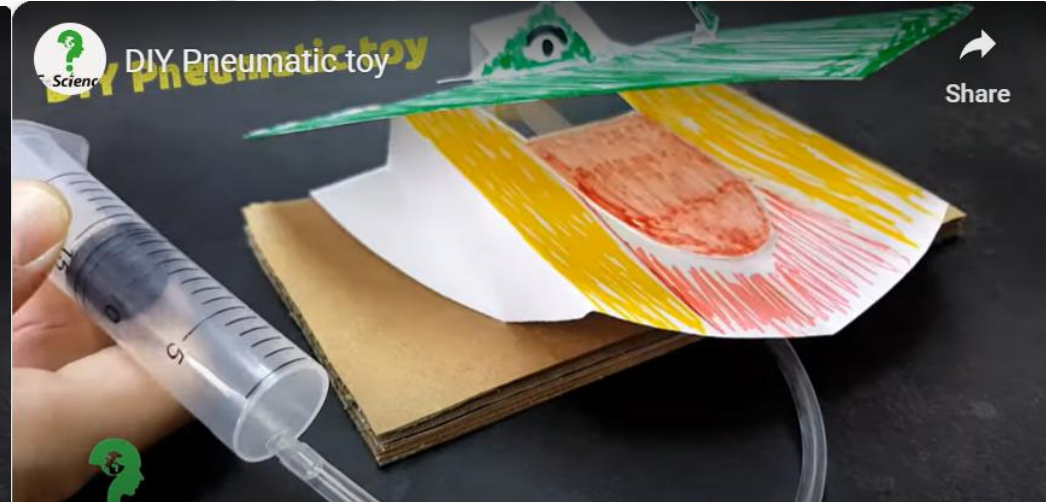
I know how to order the main stages of making.
I can select from and use appropriate tools with some accuracy to cut and join materials and components such as tubing, syringes and balloons.
I know how to select from and use finishing techniques suitable for the product I am creating

Links to other curriculum areas

Science - Materials

End Points

- To be able to use creativity and imagination to create high quality products.
- To master the use of a range of design technology tools and techniques.
- To be able to design, make and evaluate their products referring to whether it is fit for purpose and meets the design criteria.



Key vocabulary definitions.

- **Pneumatic System** – A system that uses air or gas to make things move or work.
- **Inflate/Deflate** – **Inflate** means to fill something with air (like a balloon); **deflate** means to let the air out.
- **Compression** – Squeezing something so it takes up less space, often using air or force.
- **Pump** – A tool or machine used to move air or liquid into or out of something.

DESIGN