

Mechanical systems (pneumatics)

**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.

**Facts**

**Syringes**

- ⇒ A pneumatic system consists of a pair of cylinders (syringes) connected by a pneumatic line (rubber tubing).
- ⇒ It can be converted to a hydraulic system by adding water instead of air.

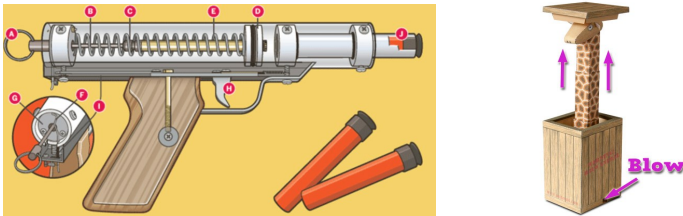


**Vocabulary**

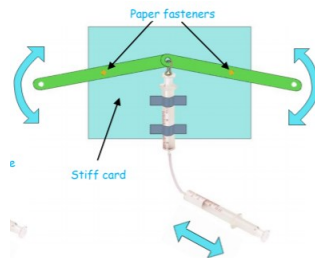
1. Compressed – something that is squashed, such as air in a tube.
2. Pneumatic – a system that works using gases (air).
3. Hydraulic – a system that works using liquids (water).
4. Pressure – the force used on an object or surface.
5. Inflate – fill something with air or a gas to make it swell up.
6. Deflate - remove the pressurised air to allow an object like a balloon to shrink.
7. Syringe – a tube with a nozzle and plunger for sucking and blowing air or liquids.
8. System - a set of related parts or components used to create an outcome. Systems have an input, process and an output. In a pneumatic system, the 'input movement' is where the user pushes or pulls a syringe or pump. The 'output movement' is where the object at the end of the tube moves.

**Pneumatics in toys**

- Lots of toys use a pneumatics system. An example would be 'Nerf guns'.
- The top of the gun acts as the syringe which holds air and when the trigger is pressed, the pressure increases and pushed the air forward which in turn pushes the foam projectile forward.



Syringes connected by plastic tubing can be used to move one or more levers in a system or design.



**Real world pneumatics and hydraulics**

- \* A pneumatic drill is a tool used to break up rock and pavement which uses compressed air to make the chisel move up and down.



- \* A paint sprayer uses compressed air to force paint particles out of the nozzle evenly.



Youtube:

<https://www.youtube.com/watch?v=YlmRa-9zDF8> - pneumatics and hydraulics basics.

**Job Opportunities:**  
 Pneumatic technician—designer, maintenance  
 Mechanical technician  
 Engineers using pneumatic tools  
 Mechanical Engineer



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