



## Endpoints for Design Technology

### Year 5 – Moving Mechanisms



Pneumatic systems lie at the centre of this topic. We will experiment with pneumatics before designing, making and evaluating a pneumatic machine.

#### What I know and can explain

A pneumatic system uses compressed air to exert a force

A strong and stable structure is necessary to support mechanisms in a machine

Testing a product against the design criteria will highlight anything that needs improvement or redesign

### Pneumatics

Compressing air increases air pressure and the amount of energy stored in it. This stored energy can be put to practical use to make things move. This is called pneumatics. The energy in the compressed air can be used to do work, such as making a piston move. This car lift uses a piston mechanism.



Air is sucked from the atmosphere and squashed in a compressor. The compressed air is stored under high pressure in a reservoir. When the in valve between the reservoir and the actuator is closed, air cannot move out of the reservoir and the piston remains down.



When the in valve is opened, the air under high pressure moves into the actuator and forces the piston to rise, lifting the car up. The air is released through the out valve to lower the piston back down again.

### Useful Vocabulary

**Actuator** – A part of a machine that moves something or makes it work

**Compress** – to press or squeeze something into a smaller space

**Force** – A push or pull that makes an object move or change its direction of movement

**Particle** – A single piece of matter that is too small to be seen

**Piston** – A short, solid piece of metal which moves up and down inside a cylinder

**Pneumatic system** - A set of interconnected parts that use compressed or pressurised gas to move mechanical parts

**Pneumatics** - The use of pressurised gas to create mechanical motion.

**Reservoir** – A place to store something until it is needed