



Cycle A Autumn Term Year 3/4 DT Knowledge Organiser - Mechanical Systems

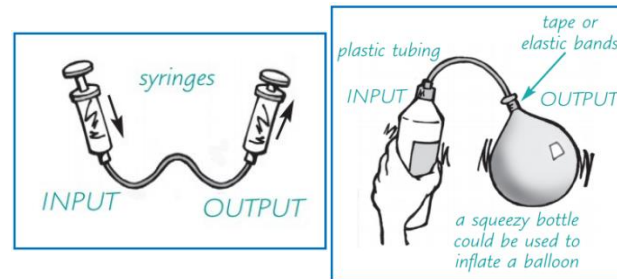
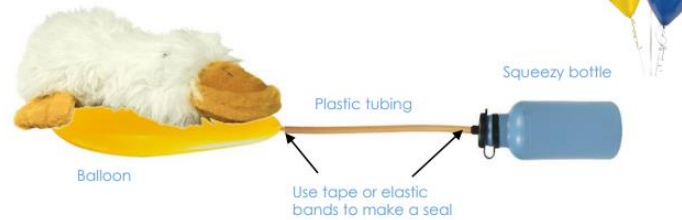
Key Vocabulary

Components, fixing, attaching, tubing, syringe, plunger, split pin, process, control, compression, pressure, pump, seal, air-tight linear, rotary, oscillating, reciprocating user, purpose, function, prototype, design criteria, innovative, appealing, design brief, research, evaluate, ideas, constraints,

Glossary

Compressed	something that is squashed, such as air in a tube.
Deflate	remove the pressurised air to allow an object like a balloon to shrink.
Function	How something works.
Inflate	fill something with air or a gas to make it swell up.
Input	Input is the motion used to start a mechanism.
Linkage	Lengths of material that are joined together by pivots, so that the links can move as part of a mechanism.
Mechanism	The parts of an object that move together as part of a machine.
Motion	The movement and object makes when controlled by an input or outpour (e.g. left, right, up, down)
Net	A 2d flat shape, that can become a 3d shape once assembled.
Output	Output is the motion that happens as a result of starting the input.
Pivot	The central point, pin, or shaft on which a mechanism turns or swings
Pneumatic System	A mechanism that runs on air or compressed gas.
Pressure	The force used on an object or surface

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



Examples of Pneumatics in everyday life:



Pneumatic Drill. The drill is connected to an air compressor with a tube. The air compressor is a bit like a giant bicycle pump that never stops blowing air. Inside the drill, the air travels around a circuit of tubes and valves. First, the air travels around the circuit in one direction, forcing the drill bit into the ground. Then, the valves change the direction of the air, forcing the drill bit back up. This happens extremely quickly.



The door openings on buses and trains, and the floors that raise and lower on buses and trains, which help people get on and off are all pneumatic.

Learning Objectives:

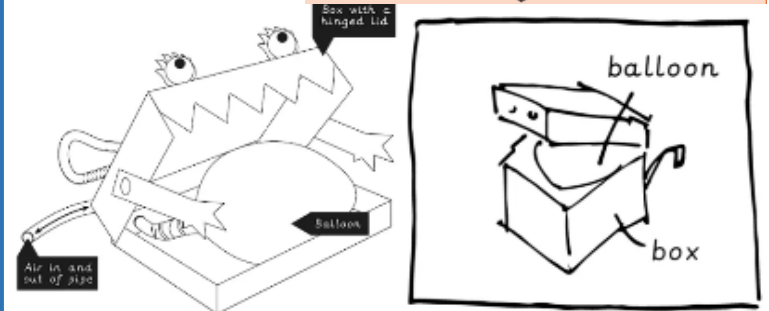
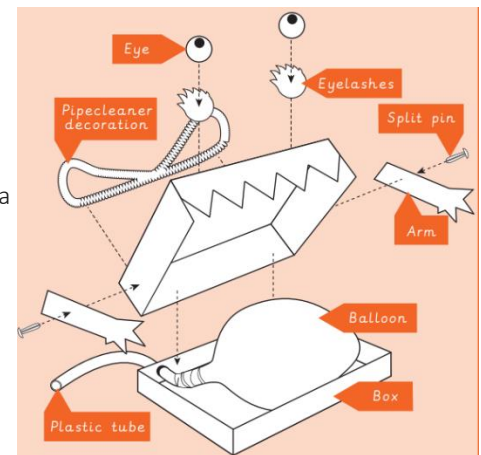
- I can understand how pneumatic systems work.
- I can design a toy that uses a pneumatic system.
- I can create a pneumatic system
- I can test and finalise ideas against design criteria

(Sticky) Knowledge & Skills that I need to remember

- Mechanics are a system of parts that work together to create motion.
- A pneumatic system can be used as part of a mechanisms and used in a range of everyday objects for example car tyres.
- A pneumatic system can force air over a distance to create movement.
- Designers use diagrams and drawings to show exactly how a product should look and work.

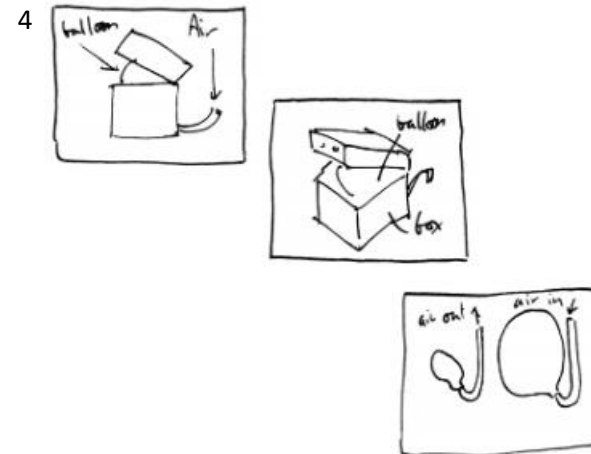
Exploded diagram

Shows all of the parts of a product, including the internal and external parts.



DT Quiz – Mechanical Systems Year 3-4

1. What is a mechanism?
 - a. Parts of an object that conduct electricity
 - b. Parts of an object that move together
 - c. Parts of an object that slot together
 - d. Parts of an object that attach to each other
2. What is a pneumatic system?
 - a. A mechanism that runs on water or ocean waves
 - b. A mechanism that runs on air or compressed gas
 - c. A mechanism that runs on food
 - d. A mechanism that runs on petrol or diesel
3. What is an exploded-diagram?
 - a. Used to illustrate how different parts of a product fit together to give a clear idea of how to make it
 - b. Displays all components of a product from above
 - c. Demonstrates how a product will fit inside the packaging
 - d. Gives information about materials and where to use them
4. What type of sketches are these?
 - a. Rushed
 - b. Thumbnail
 - c. Small
 - d. Diagrams
5. What are thumbnail sketches?
 - a. Detailed illustrations including measurements
 - b. Accurate diagrams that explain how to assemble a product
 - c. Small drawings to get ideas down on paper quickly
 - d. Large sketches to share an idea with an audience
6. What is motion?
 - a. When an event is about to happen
 - b. A sound or light emitting from something when powered with electricity
 - c. The way that something works
 - d. The movement an object makes when controlled by an input or output (left, right, up or down?)
7. What do we mean by the word function?
 - a. How something looks
 - b. How something works
 - c. How something smells
 - d. How something feels



8. What is a paper net?
 - a. A 2d flat shape, that can become a 3d shape once assembled
 - b. Something you use to catch fish and butterflies
 - c. A football goal
 - d. The packaging that surrounds a food or drink product
9. How do drawings and diagrams help designers?
 - a. It makes it easier to copy ideas and information later
 - b. To frame and display it as artwork
 - c. They help communicate exactly what the product should look like and suggest how it could work and, or be made
 - d. To sell the design to someone before making it