

Willerby Carr Lane Primary School – Design and Technology

Topic: Moving monsters

Year: 3

Strand: Mechanisms

What should I already know?

- How to join and combine materials
- How to cut and shape card (and other reclaimed materials)
- How to make hinges
- How to use a construction kit to make strong and stable structures.
- How wheeled vehicles move
- How to make a winding mechanism

What will I know / be able to do by the end of the unit?

What are pneumatics?	<ul style="list-style-type: none"> • Pneumatics is the use of pressurized air to create a motion • The input is the pressure and the output is the air that results in mechanical outcome
Where do we find mechanisms that use pneumatic systems in the real world?	<ul style="list-style-type: none"> • Examples of pneumatic systems include: <ol style="list-style-type: none"> a) Air brakes on buses and trains b) Inflatable structures c) Rollercoasters d) Pneumatic Launchers (a type of spud gun)
How could we create a mechanism using pneumatic systems?	<ul style="list-style-type: none"> • A syringe will be attached to a plastic tube which will be attached to a balloon inside a cardboard box • Pressure from the syringe will push air into the balloon through the tube • The balloon will expand and open the cardboard box (the mouth of the animal)
How can we evaluate our models to check their reliability?	<ul style="list-style-type: none"> • My moving monster will be able to open its mouth at least 10cm wide • My pneumatic system has airtight connections • I know how much air pressure will be needed to inflate the balloon to open the monster's mouth a sensible height

Vocabulary

Designing

brainstorm	Collect ideas
constraints	The rules to work within
evaluate	to judge the merits of something
suggestion	An idea to consider

Making

attaching	to join, fasten, or connect
components	a part of something
fixing	to make stable or steady; fasten firmly; attach
syringe	a small tube, usually fitted with a piston or bulb, for drawing in a quantity of fluid/ gas and pumping it out
tubing	a long, hollow piece of glass, metal, or rubber used to hold or carry liquids or gases

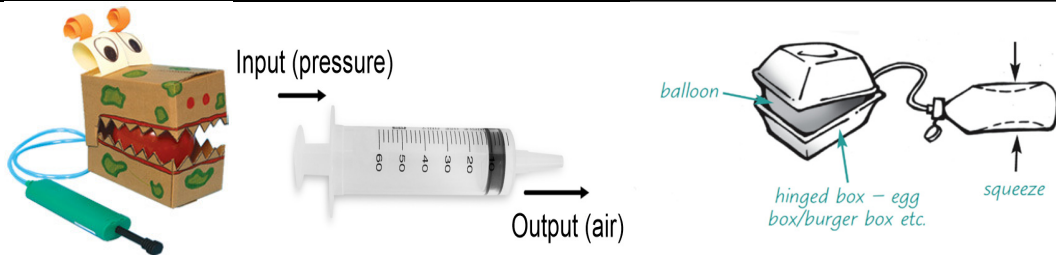
Knowledge and Understanding

deflate	to cause to shrink or collapse by letting out air or gas
hinge	a device made of two pieces connected so that one piece can open, close
inflate	to make larger or expand by pumping in air or gas
input	To put into
output	Something produced
pneumatic system	The use of pressurized air that creates a motion
pressure	a steady force upon a surface
pump	a machine for moving a liquid or gas from one place to another

Key Design Decisions & Skills

- Evaluate pre-existing models that use pneumatics
- Practise assembling a pneumatic system to inflate a balloon
- Design a monster with a moving mouth using a pneumatic system
- Choose from a range of tools and equipment accurately, such as tubing, syringes and balloons
- Measure, mark out, assemble and join materials and components with some accuracy
- Work as part of a team to make a model monster
- Evaluate own models and begin to relate their work in the classroom to products in the wider world
- Suggest what could be changed to improve the design, beginning to link this to the design brief

Pictures



Tools and resources

Syringes, balloons, scissors, rulers, burger boxes/egg boxes/cereal boxes, plastic tubing, felt tip pens, pencils

