

# Design Technology

## Mechanisms Pneumatics Year 3

### National curriculum

### Vocabulary

#### Design

To use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups.  
To generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design .

#### Make

To select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately.

To select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities.

#### Evaluate

To investigate and analyse a range of existing products.

To evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.

To understand how key events and individuals in design and technology have helped shape the world.

#### Technology

To understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages).

accuracy finishing  
accuracy measure  
criteria mark  
cut mechanical  
decisions method  
design pneumatic  
develop shape  
evaluate techniques  
features

### Investigate Technical knowledge

### Design

### Make

### Evaluate

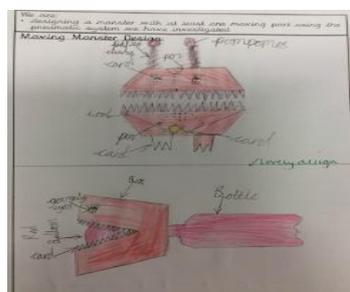
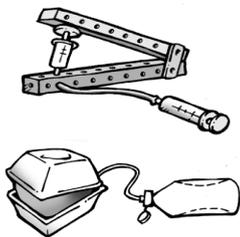
### Year 3/ 4 – DT Skills

-Develop their own design criteria and use these to inform their ideas  
-How mechanical systems such as levers and linkages or pneumatic systems create movement

-Make labelled drawings from different views showing specific features  
-Make design decisions that take account of the availability of resources

-Assemble, join and combine materials and components with some accuracy  
-Apply a range of finishing techniques, including those from art and design, with some accuracy

-Use their design criteria to evaluate their completed products



How is your finished product similar to your design?  
How is your finished product different to your design?  
How does your Pneumatic monster work?  
Difficulties in the design.

### Learning Objectives

### Lesson Outline

#### Lesson 1: Investigate

**LO:** To evaluate existing products that use pneumatics

**DT Skills:** Develop their own design criteria and use these to inform their ideas

-How mechanical systems such as levers and linkages or pneumatic systems create movement

Explain what pneumatic means and the different things this type of mechanism is used for (movement, toys, brakes, tools). Discuss and show examples on IWB of how pneumatics is used in everyday life, including the construction industry. Allow children to test different pneumatic toys and discuss how they work.

Re-cap the different Greek monsters and look at what we intend to create by the end of the subject.

How can this be done?

As a class, develop the design criteria that we will need to meet in order to create a successful product.

<p><b>Lesson 2: Skills Practice</b></p> <p><b>LO:</b> To know how pneumatic systems work</p> <p><b>DT Skills:</b> -How mechanical systems such as levers and linkages or pneumatic systems create movement</p> <p>Assemble, join and combine materials and components with some accuracy</p>	<ol style="list-style-type: none"> <li>1) Recap pneumatic designs from last week. What is the structure of what we are creating? What materials can we use to make our own? Which of these ideas would work best? How might we need to adapt them.</li> <li>2) Experimenting with different materials and testing the structure to see if they would work. (for example, paper and cardboard, are they strong enough?)</li> <li>3) Decide which idea would be best for us to use and why.</li> </ol> <p>LA – Words that can be sorted and used as a basis for annotation.</p> <p>GD – Detailed annotation required (Pros and Cons)</p>	
<p><b>Lesson 3: Design</b></p> <p><b>LO:</b> To design a moving monster that uses pneumatics</p> <p><b>DT Skills:</b> Make labelled drawings from different views showing specific features</p> <p>-Make design decisions that take account of the availability of resources</p>	<ol style="list-style-type: none"> <li>1) Looking at a model of a design idea with examples of annotations to show what is expected. Ensure that the design criteria has been followed and all aspects are included (checklist)</li> <li>2) Designing and annotating their ideas (including being able to explain how the mechanism works – zoomed in image)</li> </ol> <p>LA – Supported</p> <p>GD – Working independently, explaining their choices.</p>	
<p><b>Lesson 4: Make</b></p> <p><b>LO:</b> To make a moving monster that uses pneumatics</p> <p><b>DT Skills:</b> Assemble, join and combine materials and components with some accuracy</p>	<ol style="list-style-type: none"> <li>1) Gather the materials needed to make their final piece.</li> <li>2) Make the monsters based on the designs they have created.</li> </ol> <p>LA – Assistance given as an when required when assembling models.</p>	
<p><b>Lesson 5: Make</b></p> <p><b>LO:</b> To make a moving monster that uses pneumatics</p> <p><b>DT Skills:</b> -Apply a range of finishing techniques, including those from art and design, with some accuracy</p>	<ol style="list-style-type: none"> <li>1) Complete the monster.</li> <li>2) Add the pneumatic mechanism to make it open and close its mouth. Test the mechanism. If it doesn't work, adjust it and try again (add annotation to design in purple pen to show changes)</li> </ol> <p>LA – Assistance given as an when required when assembling models.</p>	
<p><b>Lesson 6: Evaluate</b></p> <p><b>LO:</b> To evaluate a moving monster that uses pneumatics</p> <p><b>DT Skills:</b> -Use their design criteria to evaluate their completed products</p>	<ol style="list-style-type: none"> <li>1) Finishing off their monsters (if not already)</li> <li>2) Evaluating their finished monsters. What was good/why? What could be improved/what would you do differently?</li> </ol> <p>LA – Working as a group with a TA evaluating their work. Sentence starters.</p> <p>GD – Justifying choices and suggesting improvements.</p>	
<p>Working towards</p>	<p><b>End of unit assessment</b></p> <p>Working at Age related expectations</p>	<p>Working at a greater depth</p>

