# **Design Technology**

## Mechanisms Pneumatics Year 3

### 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 .

National curriculum

#### 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	

Vocabulary

Investigate				
Technical	knowledge			

### Design

### Make

### Evaluate

-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

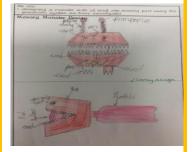
-Make design decisions that take account of the availability of resources

-Assemble, join and combine materials and components with some accuracy

Year 3/4 - DT Skills

-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.

Lesson 2: Skills Practice  LO: To know how pneumatic systems work  DT Skills: -How mechanical systems such as levers and linkages or pneumatic systems create movement  Assemble, join and combine materials and components with some accuracy  Lesson 3: Design  LO: To design a moving	<ol> <li>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>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>Decide which idea would be best for us to use and why.</li> <li>LA – Words that can be sorted and used as a basis for annotation.</li> <li>GD – Detailed annotation required (Pros and Cons)</li> <li>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> </ol>				
monster that uses pneumatics  DT Skills: Make labelled drawings from different views showing specific features  -Make design decisions that take account of the availability of resources	<ul> <li>2) Designing and annotating their ideas (including being able to explain how the mechanism works – zoomed in image)</li> <li>LA – Supported</li> <li>GD – Working independently, explaining their choices.</li> </ul>				
Lesson 4: Make  LO: To make a moving monster that uses pneumatics  DT Skills: Assemble, join and combine materials and components with some accuracy	Gather the materials needed to make their final piece.     Make the monsters based on the designs they have created.  LA – Assistance given as an when required when assembling models.				
Lesson 5: Make  LO: To make a moving monster that uses pneumatics  DT Skills: -Apply a range of finishing techniques, including those from art and	Complete the monster.     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)  LA – Assistance given as an when required when assembling models.				
Lesson 6: Evaluate  LO: To evaluate a moving monster that uses pneumatics  DT Skills: -Use their design criteria to evaluate their completed products	<ol> <li>Finishing off their monsters (if not already)</li> <li>Evaluating their finished monsters. What was good/why? What could be improved/what would you do differently?</li> <li>LA – Working as a group with a TA evaluating their work. Sentence starters.</li> <li>GD – Justifying choices and suggesting improvements.</li> </ol>				
Working towards	End of unit assessment Working at Age related expectations Working at a greater depth				