



Topic Overview
Faculty/Subject: Innovation/DT
Year Group: 9
Topic: Paper engineering



What BIG IDEAS will you cover in this topic?

Students are asked to research into papers and boards and trial a variety of paper mechanisms. . Students will test the functionality of each mechanism and create final samples. Students will need to rely on prior learning when using in and recalling information around using Craft knives and CAD softwares.

Student will look into information needed for later life when looking at the theoretical knowledge of where resources such as paper come from and how they are made.

What other key concepts, knowledge and skills will you learn in this topic?

- The paper making process
- Equipment, uses and health & safety
- Peer and self-evaluation
- CAD
- CAM
- Sketch.IO/Photopea
- Motion, Levers and mechanisms
- Paper engineering

What important prior knowledge will you use from your prior learning?

- Measured and marked out accurately.
- Identified the main stages of making any product.
- Had experience using CAD.
- Gained some understanding of the design process.
- Have a basic understanding and knowledge of some tools and equipment.

Where does this topic fit into the curriculum plan for this subject?

Students will follow on from simplistic CAD to using a drawing package (Sketch.io / Photopea). They will also have a look at levers and mechanisms in real life and create some simple paper engineering mechanisms which will hold them in good stead for modelling should they choose to take the subject for GCSE. They will look at the theory behind paper making and see how it can be made on a large and small scale. They will also look at analysing a product which has been paper engineered.

**Assessment:
How and when will you be assessed on this topic?**

What will the success criteria be?

- Class discussion, peer assessment and oral assessment.
- Teacher and student written assessment of practical work, technical language and evaluation.
- Self, peer, oral and teacher assessment methods as indicated within the scheme.
- Students will self-evaluate and set targets for future development.

EXCELLING (10-11)		
	All of the secure criteria plus: Describe improvements you could make and how you make them. Be able to work with a fine range of tolerance, and carry out quality control checks	All of the secure criteria plus: Be able to analyse technical drawings when thinking about sustainability. Understand the terms anthropometrics and ergonomics and their correlation to each other.
SECURE		
	T1 Assessment strategy: Individual/Class assessment Practical/Class assessment Paper engineering or Practical Case	T2 Assessment strategy: Individual/Class assessment Practical/Class assessment Paper engineering or Practical Case
Technical knowledge	Identify, explain and explore technical equipment, materials, components and techniques. Recognise and explain that part/mechanisms have to meet a range of different needs. In relation to suitability, be able to explain how to make a range of part/mechanisms.	Everything from terms 1 and 2 plus: Understand the characteristics of different materials, components and processes. Understand a range of advanced specialist techniques. Be able to explain the difference between different joints and mechanisms and their appropriate uses.
Evaluating	Compare design/technical product against the design brief. Suggest improvements for their product with reasons. Use technical terminology from examining, describing and evaluating.	Everything from terms 1 and 2 plus: Explain why materials or techniques have been used. Identify and justify any changes from the final design idea to the final product.
Practical Making	Select & use a range of tools, equipment and materials. Able to make a variety of wood joints or mechanisms. Work accurately and within tolerance. Produce a well designed, quality product of the final product.	Everything from terms 1 and 2 plus: Work from your own detailed plans Use a range of tools and equipment with precision Carry out a range of specialist techniques such as using specialist equipment and methods. Produce a high quality well considered product.
DEVELOPING (7-10)		
Not yet secure with all of the criteria set out for the term. Student feedback and their steps forward		

What is the key vocabulary that you will need to know in this topic?

- As defined in objectives, activities and outcomes through writing, speaking, listening and reading.
- Through the activities in this unit, pupils will be able to understand, use and spell correctly words relating to: Papers, linear, reciprocating, oscillating, V-Fold, fibrous, pulping, sizing, mechanism, recycling, sustainable.

What is the structure of learning/lessons in this topic?

Theory/practical- Functions of mechanical devices to produce movement. Construct the V Fold mechanism.
Theory/practical- Properties of papers and boards what makes them suitable for use in commercial products
 Construct the simple linear mechanism.
Theory/practical- Draining, rollering, recycling and sustainability. Construct the rotary mechanism.
Theory/practical- Product analysis. Construct the complex double linear mechanism.
Practical- How to use a CAD package and create images and layers having set their page to a specific size.
Practical-x3 lessons. Use a range of CAD tools to create background image.
Practical-x2 lessons. Demonstrate high quality and quality control checks to make mechanisms. Adhere to correct safety rules.
Theory- Evaluate