



Year 11 Specialist PD Theory D&T GCSE



West Kirby
Grammar School

Learning about this topic is important because:

Understanding specialist technical principles in wood and polymers allows students to develop a deeper understanding of how designers select, modify and use materials to create successful products. Students will learn how the properties, characteristics and limitations of specialist materials influence product design, manufacturing methods and sustainability. This knowledge supports students in developing innovative design solutions and forms an important part of the GCSE Design & Technology Product Design specialist knowledge required for the written examination and NEA project.

This builds on:

Knowledge from GCSE Design & Technology Core Technical Principles, including materials and their properties, manufacturing processes, sustainability, product analysis and practical making skills. Students will build on their understanding of timbers and polymers by exploring specialist materials, processes and applications in greater depth.

This leads to:

Students being well prepared to undertake the GCSE written examination and apply specialist technical knowledge when designing, making and evaluating products. Students will be able to justify material choices, select appropriate manufacturing processes and consider how specialist materials can improve product performance, appearance and functionality.

We will learn:

Specialist technical principles relating to wood-based materials and polymers.
The properties, characteristics and applications of natural timbers, manufactured boards and modified wood products.
The advantages and disadvantages of hardwoods, softwoods and manufactured boards.
How wood can be modified, enhanced and processed for specialist applications.
Specialist polymer materials, including thermoplastics, thermosetting plastics and elastomers.
The properties and applications of specialist polymers used in modern product design.
How additives can improve polymer performance, including improving strength, flexibility, durability, colour and resistance to environmental conditions.
Manufacturing processes used with wood and polymers, including shaping, forming, cutting, joining and finishing techniques.

We will develop/practise skills including:

Demonstrating and applying knowledge of specialist wood and polymer materials.
Explaining why designers select particular specialist materials for specific applications.
Comparing the advantages and disadvantages of different wood-based materials and polymers.
Understanding how material properties affect product performance and manufacturing decisions.
Identifying suitable manufacturing processes for specialist materials.
Evaluating the sustainability and environmental impact of material choices.
Using appropriate Design & Technology terminology accurately.
Developing confidence in answering GCSE-style multiple-choice, short-answer and extended exam questions.

Some of the vocabulary that we will use includes:

- hardwood/softwood/manufactured boards
- grain direction
- thermoplastic/thermosetting polymers
- injection moulding
- vacuum forming
- extrusion
- line bending

You could learn more about this topic by:

Specialist Materials: Wood and Polymers (GCSE Design & Technology Revision – YouTube)
Timber Properties and Applications (GCSE Design & Technology Revision – YouTube)
Manufactured Boards and Wood Processes (GCSE Design & Technology Revision – YouTube)
Polymers and Plastic Manufacturing Processes (GCSE Design & Technology Revision – YouTube)
Material Selection in Product Design (GCSE Design & Technology Revision – YouTube)
BBC Bitesize GCSE Design & Technology revision resources.



Your teacher will assess your knowledge & understanding throughout the topic by:

Looking at your work, questioning, discussion and giving you feedback in lots of ways. Assessment will include classwork, questioning, discussion, retrieval activities, homework and regular feedback.