



Year 10 Core Theory D&T GCSE

Learning about this topic is important because:

Understanding energy storage, modern materials and systems helps students appreciate how advances in science and technology have transformed product design and manufacturing. Students will learn how innovative materials and systems improve the performance, sustainability and functionality of products. This knowledge forms an important part of the GCSE Design & Technology Core Technical Principles and supports successful performance in the written examination.

This builds on:

Knowledge from **KS3 Design & Technology**, including materials, properties, basic electronics, product design and manufacturing processes.

This leads to:

Students being well prepared to undertake the GCSE written examination by developing an understanding of modern materials, energy storage technologies and systems used in contemporary product design. Students will also be able to apply this knowledge when analysing, designing and evaluating products.

We will learn:

Energy storage methods and battery technologies.
Modern materials and their applications.
Smart materials and how they respond to changes in their environment.
Composite materials and technical textiles.
The systems approach to designing, including inputs, processes, outputs and feedback.

We will develop/practise skills including:

Demonstrating and applying knowledge of modern materials and systems.
Explaining why designers select particular materials for specific applications.
Comparing the advantages and disadvantages of different energy storage methods.
Understanding how systems work and how components interact.
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:

- modern materials
- graphene
- nanomaterials
- shape memory alloy (SMA)
- shape memory polymer (SMP)
- thermochromic pigment
- photochromic pigment
- composite materials
- carbon fibre
- fibreglass (GRP)
- Kevlar®
- technical textiles

You could learn more about this topic by:



Modern Materials (GCSE Design & Technology Revision – YouTube)
Smart Materials Explained (GCSE Design & Technology Revision – YouTube)
Composite Materials and Technical Textiles (GCSE Design & Technology Revision – YouTube)
Systems Approach to Designing (GCSE Design & Technology Revision – YouTube)
Energy Storage and Battery Technology (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. Looking at your classwork, questioning, discussion, retrieval activities, homework and providing regular feedback. Students' knowledge and understanding will be assessed through GCSE-style quizzes, multiple-choice questions.



Year 10 Core Theory D&T GCSE

Learning about this topic is important because:

Understanding mechanical devices and a range of materials helps students develop knowledge of how products are designed, manufactured and improved. Students will learn how designers select appropriate materials and mechanisms based on their properties, performance, sustainability and suitability for a specific application. This knowledge forms an important part of the GCSE Design & Technology Core Technical Principles and supports students in analysing existing products, developing design solutions and preparing successfully for the written examination.

This builds on:

Knowledge from KS3 Design & Technology, including materials and their properties, mechanisms, structures, manufacturing processes, product analysis and practical making skills.

This leads to:

Students being well prepared to undertake the GCSE written examination by developing an understanding of mechanical systems and a wide range of materials used in contemporary product design. Students will also be able to apply this knowledge when designing, modelling, manufacturing and evaluating products.

We will learn:

Mechanical devices, including mechanisms and how they transfer and transform movement.
Papers and boards, including their properties, applications and manufacturing processes.
Timbers, including hardwoods, softwoods, manufactured boards and their uses.
Metals, including ferrous, non-ferrous and alloys, their properties and applications.
Polymers, including thermoplastics, thermosetting plastics and elastomers.
Textiles, including natural, synthetic and blended fibres, fabrics and their applications.

We will develop/practise skills including:

Demonstrating and applying knowledge of materials, their properties and applications.
Explaining why designers select particular materials for specific products.
Comparing the advantages and disadvantages of different materials and manufacturing choices.
Understanding how mechanical devices operate and how components interact.
Identifying and explaining different mechanisms used in products.
Using appropriate Design & Technology terminology accurately.

Some of the vocabulary that we will use includes:

- linear motion
- rotary motion
- reciprocating motion
- oscillating motion
- manufactured boards
- hardwood/softwood
- manufactured board
- ferrous metals & non-ferrous
- alloys
- thermoplastics & thermosetting polymers
- natural fibres & synthetic

You could learn more about this topic by:

Mechanical Devices (GCSE Design & Technology Revision – YouTube)
Papers and Boards (GCSE Design & Technology Revision – YouTube)
Timbers and Manufactured Boards (GCSE Design & Technology Revision – YouTube)
Metals and Alloys (GCSE Design & Technology Revision – YouTube)
Polymers and Plastics (GCSE Design & Technology Revision – YouTube)
Textiles and Fibres (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. Students' knowledge and understanding will be assessed through GCSE-style quizzes, multiple-choice questions, short-answer questions and extended written responses.



Year 10 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.



Year 10 D&T- Textiles – Aprons

Learning about this topic is important because:

It allows students to develop decorative skills that they could apply to their NEA

This builds on: Yr 9 and 10 work when students made an upcycled bag and developed skills on the sewing machine. They will be focusing on decoration and quality of finish. It is also about designing for another user, other than themselves.

This leads to: NEA and practical elements.

We will learn:

- Taking measurements
- Designing for another user
- Making their own pattern based upon measurements
- Bagging out
- Using applique, embellishment, cad/ cam
- Using ties

We will develop/practise skills including:

- How to correctly cut out accurately
- How to create a pattern to fit out body measurements
- How to use designers as influence in current work
- How to interpret markings on a pattern.
- QC

Some of the vocabulary that we will use includes:

Bagging out, cord, webbing, applique. Overlocker, Sewing machine, Adapting a pattern/making a pattern

You could learn more about this topic by:

Read: Prima

Watch: Watching BBC sewing Bee- episode on Aprons 2022 series

Practice: Practicing your sewing skills at home

Visit: Shops to look at existing products.



Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The key pieces of work in this topic are:

QC, finish, embellishment



Year 10 D&T- Textiles – Bags

Learning about this topic is important because:

It allows students to develop decorative skills that they could apply to their NEA

This builds on: Yr 9 and 10 work when students made an upcycled cushion and developed skills on the sewing machine. They will be focusing on decoration and quality of finish. It is also about designing for another user, other than themselves. Making a product to fit something In so measurements are Important.

This leads to: NEA and practical elements including making a skirt.

We will learn:

- Taking measurements
- Designing for another user
- Making their own pattern based upon measurements
- Bagging out
- Using applique, embellishment, cad/ cam
- Using webbing for handles
- Product analysis

We will develop/practise skills including:

- How to correctly cut out accurately
- How to create a pattern to fit body measurements or to fit A3 folder into.
- How to use current products to influence design work
- QC

Some of the vocabulary that we will use includes:

Bagging out, cord, webbing, applique. Overlocker, Sewing machine, Adapting a pattern/making a pattern

You could learn more about this topic by:

Read: Prima

Watch: Watching BBC sewing Bee- episode on bags 2022 series

Practice: Practicing your sewing skills at home

Visit: Shops to look at existing products.



Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The key pieces of work in this topic are:

QC, finish, embellishment, design work.



Year 10 D&T- Textiles – Hoodies

Learning about this topic is important because:

It allows students to develop an awareness of a designer and to use a knitted fabric for the first time.

This builds on: Yr 9 Work when students made an upcycled Aprons and developed skills on the sewing machine.

Were introduced to the skill of upcycling

This leads to: Making a skirt

We will learn:

- Taking measurements
- Using a commercial pattern
- Cutting out stretchy fabric
- Sewing difficult fabrics on the machine
- Using cord and embellishment
- Hemming and creating channels

We will develop/practise skills including:

- How to correctly cut out a stretchy fabric
- How to adapt a pattern to fit out body measurements
- How to use designers as influence in current work
- How to interpret markings on a pattern.
- How to use the sewing machine to attach a hood and cord, buttonholes
- QC
- How to measure and sew a hem.

Some of the vocabulary that we will use includes:

Knitted fabrics, sweatshirt material, hood, designer influence.
Overlocker, Sewing machine, adapting a pattern.

You could learn more about this topic by:

Read: Info on the designer

Watch: Watching BBC sewing Bee- episode on sports tops- 2022 series

Practice: Practicing your sewing skills at home

Visit: Shops to look at existing products.



Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The key pieces of work in this topic are:

QC, finish, fit, designer reflection in our piece.