Design & Technology

Year 10/11 Big Picture – GCSE D&T 2025-27

Design & Technology is an inspirational and exciting subject that keeps pace with the cutting-edge developments of an ever-changing modern world. Using their creativity and imagination students will design and make products that both solve real and relevant problems whilst considering their own and others needs, wants and values. They will be challenged and will acquire a broad range of skills giving them good cross curricular links in mathematics, engineering, Science and Art. The students will gain a greater appreciation of the impact Technology has on the wider world, gaining experience both from a historical context and looking forward at future developments. Drawing upon our local contributions where Manchester has been and continues to be at the forefront of Technological developments that drive worldwide benefits. High quality Design and Technology education gives students a greater understanding of the need to work in a sympathetic way with our environment especially in the current climate where past mistakes have now lead to the desperate need to work in greater harmony using modern developments.

Aims

The national curriculum for design and technology aims to ensure that all pupils:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- critique, evaluate and test their ideas and products and the work of others

Year 10 Overview

Over the course of this year the students will have the opportunity to learn the core theory and specialist technical theory that will prepare them for being able to start the NEA in July and help get them ready for the external exam next year. This year will be a combination of theory lessons and focussed practical activities.

Core Technical Principles

The core knowledge will form the foundation of this subject and the students will need to demonstrate their understanding of the following areas in the external examination and the NEA. The core will cover the following areas;

new and emerging technologies - energy generation and storage - developments in new materials - systems approach to designing - mechanical devices - materials and their working properties.

Specialist Technical Principles

Alongside the core the students should also develop an in-depth understanding of the following Technical principles that relate to Design and Technology

Year 10/11 Big Picture – GCSE D&T 2025-27

selection of materials or components - forces and stresses - ecological and social footprint - sources and origins - using and working with materials stock forms, types and sizes - scales of production - specialist techniques and processes - surface treatments and finishes.

These principles will be taught within the context of Timber based materials.

Autumn 01 2023 Weeks 1 – 7 (7 weeks) OCTOBER HALF TERM	***Autumn 02 2023 Weeks 8 – 15 (7 weeks) CHRISTMAS***	***Spring 01 2024 Week 16- 22 (7 weeks) FEBRUARY HALF TERM***
Content The theory the students will be to cover this term will be; **Unit 5 B Timber based Materials** 1. Sources and origins 2. Working with Timbers 3. Commercial manufacturing **Skills**: • Recall the main processes involved in producing workable forms of timber • Recognise common faults in natural timber • Explain sustainability and ethical factors in timber production and in use • Identify FSC and PEFC timber • Name the common commercial stock forms, types and sizes of timber based materials • Identify different types of knock-down fittings • Describe school based cutting, forming and processing techniques, tools and equipment	**Content** The students will continue to study theory based around how materials area manufactured on an industrial scale. **Unit 3 Materials and their working properties** 1. Timbers 2. Papers and Boards 3. Textiles 4. Polymers 5. Metal and Alloys **Skills:** • Know the primary sources of materials for producing a variety of materials in each of five key material areas • Be able to recognise and characterise different types of materials in each key area	**Content** Technology is a fast moving and ever changing subject and students need to appreciate how these technologies are continuing to influence and change the way in which we manufacture and interact with products **Unit 1 New and emerging Technologies** 1. Industry and enterprise 2. Sustainability and the Environment **Skills:** • Explain the impact of new and emerging technologies on tools and equipment • Explain how robotics have affected the workplace • Understand that new technologies need to be developed and produced in a sustainable way • Be aware of the impact that excessive use of certain resources has on the environment

Year 10/11 Big Picture – GCSE D&T 2025-27

• Explain how timbers and boards are selected and processed for commercial products • Know how materials are cut, shaped and formed to a tolerance • Identify techniques for preparation and application of treatments and finishes to enhance functional and aesthetic properties • Explain why manufactured board is suitable for flat pack furniture		
Assessment Objectives This is the knowledge, application and skills assessed by the Progress check Unit 1 Mini test 1 Class feedback sheets to be completed based on the skills covered during the unit of work. This is to raise and rectify all the misconceptions, so students perform better **Attitude to Learning (ATL) - Data capture**	**Assessment Objectives** **Attitude to Learning (ATL) - Data capture**	**Assessment Objectives** **Attitude to Learning (ATL) & Big test % - Data capture**
Spring 02 ***Weeks 23 – 27 (5 weeks)*** ***EASTER***	***Summer 01*** ***Weeks 28 – 33 (6 weeks)*** ***WHIT***	***Summer 02*** ***Weeks 34 – 40 (7 weeks)***
Content The student will continue to investigate new and emerging Technologies covering the following areas **Unit 1 New and emerging Technologies** – cont. 3. People, culture and society 4. Production techniques and systems	**Content** The students will undertake a short practical investigation investigating the work other designers and manufacturers. This will lead into their NEA and the external exam **Unit 6 Designing Principles**	**Content** **Skills:** The students will have the opportunity towards the end of spring 2 to start the NEA. The theme will be set by the exam board and will not be released until around June. Once released the students will be able to start establishing how they will interpret that theme and turn that into a brief they can work from.

Design & Technology

Year 10/11 Big Picture – GCSE D&T 2025-27

5. Informing design decisions **Skills**: • Describe co-operative and fair trade organisations • Understand how technology push and market pull affect consumer choice and employment • Describe how changes in fashion and trends affect designers and manufacturers • Understand contemporary and potential future use of automation, Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM) • Understand how products can be designed to be repaired and recycled	2. The work of Others. The main theory that will be looked at this term will be **Unit 4 Common Specialist Technical Principles** 1. Forces and Stresses 2. Improving functionality **Skills:** • Name and describe each of the different forces and stresses • Recognise how materials have been stiffened or reinforced • Give examples of the use of bending, lamination, folding, webbing and interfacing	The theory will look at the remaining part of Unit 4 **Unit 4 Common Specialist Technical Principles** - *Cont* 3. Ecological and social footprint 4. The six r's 5. Scales of production **Skills:** • Define an ecological and social footprint • Understand how deforestation, mining, drilling and farming affect our ecology • Understand that carbon dioxide is produced during the manufacture of products and its influence on global warming • Explain each of the six Rs • Explain how safe working conditions and pollution impact on others • Explain how products are produced in each of the four main scales of production
Assessment Objectives **Attitude to Learning (ATL) - Data capture**	**Assessment Objectives** **Attitude to Learning (ATL) - Data capture**	**Assessment Objectives** **Attitude to Learning (ATL) - Data capture**

Year 11

Design & Technology

Year 10/11 Big Picture – GCSE D&T 2025-27

Year 1 Overview

Over the course of this year the students will be mainly completing their NEA for this subject. This will represent 50% of their assessed work for the course. There will be some theory content taught which will be some new content but will also focus reflective work on theory taught last year

Core Technical Principles

The core knowledge will form the foundation of this subject and the students will need to demonstrate their understanding of the following areas in the external examination and the NEA. The core will cover the following areas;

new and emerging technologies - energy generation and storage - developments in new materials - systems approach to designing - mechanical devices - materials and their working properties.

Specialist Technical Principles

Alongside the core the students should also develop an in-depth understanding of the following Technical principles that relate to Design and Technology

selection of materials or components - forces and stresses - ecological and social footprint - sources and origins - using and working with materials stock forms, types and sizes - scales of production - specialist techniques and processes - surface treatments and finishes.

These principles will be taught within the context of Timber based materials.

Autumn 01 2023 Weeks 1 – 7 (7 weeks) OCTOBER HALF TERM	***Autumn 02 2023 Weeks 8 – 15 (7 weeks) CHRISTMAS***	***Spring 01 2024 Week 16- 22 (7 weeks) FEBRUARY HALF TERM***
Content The students will focus on continuing to work on their NEA. They will focus on the following parts Completing Section A Analysis of the context Completing Section B Design Brief and Specification Completing Section C Initial Ideas	**Content** The students will focus on Section D Development of ideas. This will give students the opportunity to model and refine their designs allowing them to make some final decisions about the size, and shape of their work which	**Content** Section E Realising Design Ideas The students will mainly engage with the practical work of pricing their prototype model for their NEA. During this time they will document this process creating a production plan that shows the

Design & Technology

Year 10/11 Big Picture – GCSE D&T 2025-27

This should take students up to pages 7 (approximately on the tracker

Unit 2

4. Modern materials
5. Smart materials

Skills:

- Students will undertake a number of task that will help them towards fulfilling the AO1 objectives and move them towards fulfilling the assessment criteria for Section A

This will involve,

- Problem solving and analysing to understand contexts
- Organising data and information to plan research strategies
- Evaluation of material to create a useable specification to guide designs
- Production of a wide range of designs using appropriate sketching methods that clearly show a logical thought process

will lead them to producing a cutting list for this project so they can begin to realise the project when they come back after the Christmas break.

Tracker pages 8-10 approximately

Skills:

- Demonstartion of practical skills whilst modelling and refining ideas
- Continued research tasks that are informed by the iterative process of development as research and modelling inform the designs
- Production of a sound manufacturing plan
- Demonstration of the use of CAD to support the development of an idea

making process that they went through which will illustrate the tools and processes used.

Unit 1 New and emerging Technologies

6. Industry and enterprise
7. Sustainability and the Environment

Skills:

- Explain the impact of new and emerging technologies on tools and equipment
- Explain how robotics have affected the workplace
- Understand that new technologies need to be developed and produced in a sustainable way
- Be aware of the impact that excessive use of certain resources has on the environment

Demonstrating practical knowledge and realising their designs in the workshop.

Note: a skill only needs to be demonstrated once. The students are making a prototype and do not have to make a finished complete product. They only need to make a product that broadly gives the impression of their finished design and gives examples of each intended skill/technique or finish.

Design & Technology

Year 10/11 Big Picture – GCSE D&T 2025-27

Assessment Objectives	Assessment Objectives	Assessment Objectives
AO1: Identify, investigate and outline design possibilities to address needs and wants. AO2: Design and make prototypes that are fit for purpose. Progress check in September And PPE 1 Mini test 1 Class feedback sheets to be completed based on the skills covered during the unit of work. This is to raise and rectify all the misconceptions, so students perform better **Attitude to Learning (ATL) – Progress check assessment to have been completed by 30th September.**	AO2: Design and make prototypes that are fit for purpose. **Attitude to Learning (ATL) - Data capture**	**Attitude to Learning (ATL) & Big test % - Data capture**

Spring 02 *Weeks 23 – 27 (5 weeks)* *EASTER*	*Summer 01* *Weeks 28 – 33 (6 weeks)* *WHIT*	*Summer 02* *Weeks 34 – 40 (7 weeks)*
Content Section E Realising Design Ideas The student should demonstrate they can analyse and evaluate their design throughout the design process not just at the end of the project. Having produced the prototype it should be evident they can evaluate their product against the specification and the needs of the clients requirements.	**Content** Final reflective revision for the summer external exam in May. This will look back over the work covered in year 10 and the theory covered as a result of completing the NEA. This will predominantly focus on the following areas New and emerging technologies Energy, creation and Storage Developments in New Materials	**Content** **Skills:** **Skills:** •

Design & Technology

Manchester Academy

Year 10/11 Big Picture – GCSE D&T 2025-27

Skills: Extensive evidence that various iterations are as a direct result of considerations linked to testing, analysis and evaluation of the prototype, including well considered feedback from third parties. Comprehensive testing of all aspects of the final prototype against the design brief and specification. Fully detailed and justified reference is made to any modifications both proposed and undertaken. Excellent ongoing analysis and evaluation evident throughout the project that clearly influences the design brief and the design and manufacturing specifications.	Materials and their working Properties Scales of Production Timbers and their properties **Skills:** • Revision techniques • Exam practice • Answering exams in an efficient manner	
Assessment Objectives **Attitude to Learning (ATL) - Data capture**	**Assessment Objectives** **Attitude to Learning (ATL) - Data capture**	**Assessment Objectives**