**D&T GCSE Keywords and Headlines from the DfE Subject Content**

This document is intended as a starting point for reviewing a department's provision for the D&T GCSE. It can be used as a quick reference tool when auditing and planning a curriculum.

Statements are taken from the DfE GCSE Subject Content for D&T (2015) https://goo.gl/cwIxzZ. This is the document the awarding bodies had to use to when writing their specifications.

Using these statements when starting to curriculum plan rather than the awarding body specifications allows the curriculum to be stripped back to its key learning priorities and creates a more accessible tool to use for mapping, auditing and reviewing.

Wording in the handout is the same as the original document with only minor changes to make formatting the document easier. It is still recommended, however, that the original document is read in full.

Blank rows might be used to identify content linked to specific school and community needs.

The statements are categorised under the side headings in line with the headings used in the original document.

Statements starting with the phrase 'in relation to at least one of the material categories ….' indicate learning that relates to the student's chosen specialist material area. Statements without this starting point are part of the core content and this is knowledge all students must know.

When using the document the 'technical principle' and 'design and make principle' statements are probably the most important ones to focus on to begin with. The 'maths', 'science' and statements in the 'introduction and aims' section of the document are important but much of the content of these statements link to some of the technical principle and design and make statements and may be more useful for additional information and for cross referencing.

This document is in PDF format.

On some of our courses we use this document and a range of other curriculum documents we have created to consider what a 5 year curriculum with sequence and progression built in might look like (7 year including A level). See our course calendar at http://www.julieboyd.co.uk/CPD/calendar/

**D&T GCSE Keywords and Headlines for D&T**

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| **Introduction, Aims & Objectives** | Understand and apply iterative design processes through which they explore, create and evaluate a range of outcomes | |
| | Use creativity and imagination to design and make prototypes (In the context of this document, the term 'prototype' refers to a functioning design outcome. A final prototype could be a highly finished product, made as proof of concept prior to manufacture, or working scale models of a system where a full-size product would be impractical). | |
| | Evidence of modelling to develop and prove product concept and function | |
| | Apply knowledge from other disciplines, including mathematics, science, art and design, computing and the humanities | |
| | Subject knowledge in design and technology that builds on key stage 3 | |
| | Knowledge and understanding of different materials and manufacturing processes | |
| | Design and make, with confidence, prototypes in response to issues, needs, problems and opportunities | |
| | Take design risks | |
| | Awareness of practices from the creative, engineering & manufacturing industries | |
| | Design and technology activity, both historic and present day | |
| | Understand that high-quality design and technology is important to the creativity, culture, sustainability, wealth and well-being of the nation and the global community | |
| | Prepare students to participate confidently & successfully in an increasingly technological world | |
| | Historical, social/cultural, environmental and economic factors | |
| | Understanding that all design and technological activity takes place within contexts that influence the outcomes of design practice | |
| | Develop realistic design proposals as a result of the exploration of design opportunities and users' needs, wants and values | |
| | Use imagination, experimentation and combine ideas when designing | |
| | Develop the skills to critique & refine their own ideas whilst designing and making | |
| | Communicate their design ideas & decisions using different media & techniques | |
| | Broad knowledge of materials, components and technologies and practical skills to develop high quality, imaginative and functional prototypes | |
| | Consider the costs, commercial viability and marketing of products | |
| | Demonstrate safe working practices in design and technology | |
| | Use key design and technology terminology | |
| **Technical Principles** | The impact of new & emerging technologies on industry, enterprise, sustainability, people, culture, society and the environment, production techniques & systems | |
| | How the critical evaluation of new and emerging technologies informs design decisions; considering contemporary and potential future scenarios from different perspectives, such as ethics and the environment | |
| | How energy is generated and stored in order to choose and use appropriate sources to make products and to power systems | |
| | Developments in modern & smart materials, composites & technical textiles | |
| | How electronic systems provide functionality to products & processes, including sensors & control devices to respond to a variety of inputs, & devices to produce a range of outputs | |
| | The use of programmable components to embed functionality into products in order to enhance and customise their operation | |
| | The functions of mechanical devices, to produce different sorts of movement, changing the magnitude and direction of forces | |
| | Categorisation of the types / properties of materials: Papers and boards | |
| | Categorisation of the types / properties of materials: Natural and manufactured timber | |
| | Categorisation of the types / properties of materials: Ferrous & non ferrous metals | |
| | Categorisation of the types / properties of materials: Thermoforming & thermosetting polymers | |
| | Categorisation of the types and properties of materials: Natural, synthetic, blended and mixed fibres, and woven, non-woven and knitted textiles | |
| | In relation to at least one of the material categories: The sources, origins, physical and working properties of the material categories or the components and systems, and their ecological and social footprint | |
| | In relation to at least one of the material categories: The way in which the selection of materials or components is influenced by a range of factors, such as functional, aesthetic, environmental, availability, cost, social, cultural and ethical | |

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| **Technical Principles** | In relation to at least one of the material categories: The impact of forces and stresses on materials and objects and the ways in which materials can be reinforced and stiffened | |
| | In relation to at least one of the material categories: Stock forms, types and sizes in order to calculate and determine the quantity of materials or components required | |
| | In relation to at least one of the material categories: Alternative processes that can be used to manufacture products to different scales of production | |
| | In relation to at least one of the material categories: Specialist techniques & processes that can be used to shape, fabricate, construct & assemble a high quality prototype, including techniques such as wastage, addition, deforming and reforming, as appropriate to the materials and/or components being used | |
| | In relation to at least one of the material categories: Appropriate surface treatments and finishes that can be applied for functional and aesthetic purposes | |
| **Designing & Making Principles** | Understand that all design and technological practice takes place within contexts which inform outcomes | |
| | Identify & understand client & user needs through collection of primary & secondary data | |
| | Demonstrate an ability to write a design brief and specifications from their own and others' considerations of human needs, wants and interests | |
| | Investigate factors, such as environmental, social and economic challenges, in order to identify opportunities and constraints that influence the processes of designing & making | |
| | Explore and develop their ideas, testing, critically analysing and evaluating their work in order to inform and refine their design decisions thus achieving improved outcomes. | |
| | Investigate and analyse the work of past and present professionals and companies in the area of design and technology in order to help inform their own ideas | |
| | Use different design strategies, such as collaboration, user-centred design and systems thinking, to generate initial ideas and avoid design fixation | |
| | Develop, communicate, record and justify design ideas, applying suitable techniques, for example: formal and informal 2D and 3D drawing; system and schematic diagrams; annotated sketches; exploded diagrams; models; presentations; written notes; working drawings; schedules; audio and visual recordings; mathematical modelling; computer-based tools | |
| | Design and develop at least one prototype that responds to needs and/or wants and is fit for purpose, demonstrating functionality, aesthetics, marketability and consideration of innovation (innovation in this context refers to students considering new methods or ideas to improve and refine their design solutions and meet the needs of the intended market or primary user) | |
| | Make informed and reasoned decisions, respond to feedback about their own prototypes (and existing products and systems) to identify the potential for further development and suggest how modifications could be made | |
| | In relation to at least one of the material categories: Selecting and working with appropriate materials and components in order to produce a prototype | |
| | In relation to at least one of the material categories: Using appropriate and accurate marking out methods including: measuring and use of reference points, lines and surfaces; use templates, jigs and/or patterns; work within tolerances; understand efficient cutting and how to minimise waste | |
| | In relation to at least one of the material categories: Using specialist tools and equipment, appropriate to the materials or components used (including hand tools, machinery, digital design and manufacture), to create a specific outcome | |
| | In relation to at least one of the material categories: Using specialist techniques and processes to shape, fabricate, construct and assemble a high quality prototype, including techniques such as wastage, addition, deforming and reforming, as appropriate to the materials and/or components being used | |
| | In relation to at least one of the material categories: Using appropriate surface treatments and finishes for functional and aesthetic purposes | |
| **Links to Maths** | Recognise and use expressions in decimal and standard form e.g. calculation of quantities of materials, costs and sizes | |
| | Use ratios, fractions and percentages e.g. scaling drawings, analysing responses to user questionnaires | |
| | Calculate surface area and volume e.g. determining quantities of materials | |
| | Presentation of data, diagrams, bar charts & histograms e.g. construct & interpret frequency tables; present information on design decisions | |
| | Plot, draw and interpret appropriate graphs e.g. analysis and presentation of performance data and client survey responses | |
| | Translate information between graphical and numeric form e.g. extracting information from technical specifications | |

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| **Links to Maths** | Use angular measures in degrees e.g. measurement and marking out, creating tessellated patterns | |
| | Visualise and represent 2D and 3D forms including two dimensional representations of 3D objects e.g. graphic presentation of design ideas and communicating intentions to others | |
| | Calculate areas of triangles and rectangles, surface areas and volumes of cubes e.g. determining the quantity of materials required | |
| **Links to Science** | Quantities, units and symbols e.g. appropriate use of scientific terms when developing a design brief and specifications | |
| | SI units (e.g. kg, g, mg; km, m, mm; kJ, J), prefixes & powers of ten for orders of magnitude (e.g. tera, giga, mega, kilo, centi, milli, micro & nano) e.g. calculation of quantities, measurement of materials & selection of components | |
| | Metals & non-metals & the differences between them, on the basis of their characteristic physical/chemical properties e.g. classification of the types & properties of a range of materials | |
| | The basic principles in carrying out a life- cycle assessment of a material or product e.g. selection of materials & components based on ethical factors, taking into consideration the ecological & social footprint of materials | |
| | The conditions which cause corrosion & the process of corrosion & oxidisation e.g. understanding of properties of materials & how they need to be protected from corrosion through surface treatments & finishes. Appreciate how oxidisation can be used when dyeing materials. | |
| | The physical properties of [materials], how the properties of materials are selected related to their uses e.g. knowledge of properties of materials to be applied when designing and making | |
| | The main energy sources available for use on Earth (including fossil fuels, nuclear fuel, bio-fuel, wind, hydro- electricity, the tides and the Sun), the ways in which they are used and the distinction between renewable and non- renewable sources e.g. understanding of how to choose appropriate energy sources | |
| | The action of forces & how levers & gears transmit & transform the effects of forces e.g. knowledge of the function of mechanical devices to produce different sorts of movement, changing the magnitude & direction of forces | |
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