

### INTENT: A powerful, knowledge-rich curriculum

**By the end of their education, a student of Design Technology at Dixons Fazakerley Academy:**

- Learn how to take calculated risks, becoming resourceful, creative, innovative, and capable citizens who are aware of their environment and their impact on it.
- Through research, analysis and evaluation of cultural design, past and present D&T, they will develop a critical understanding of its impact on daily life and the wider world.
- Will understand that D&T impacts our local surroundings and our world, making essential contributions to the creativity, culture, wealth and well-being within a modern society.

**Our unifying 'sentence' is:**

**"The Design and Technology department equipped students with the powerful knowledge to participate confidently and successfully in an increasingly technological world, learning how to be innovative, environmentally aware and make creative use of a variety of resources to improve the world around them."**

**In order to deliver a powerful, knowledge-rich curriculum we have selected knowledge by:**

- The purpose of KS3 is to give them a strong foundation of core knowledge. The classification and physical properties of textiles, paper and board, timber, polymers and metals are covered as essential core knowledge on which to build. A deeper understanding of the material areas is developed as students move through KS3 including material sources, environmental impact of material choice. At KS3 students start to explore the iterative design process and manufacturing techniques. The impact of product lifecycle on the environment is a prominent aspect of the world of design. The KS3 curriculum raises students' knowledge and understanding of how designers can minimize the negative impact of products on the environment.
- At KS4, in order to make effective design choices, students will need a breadth of core technical knowledge and understanding by learning about new and emerging technologies, energy generation mechanical devices and knowledge of materials, their properties and applications.
- Students develop further understanding of a specialist technical principle from the core material areas. This includes material selection, sources, surface treatments and finishes, forces and stresses, and ecological and social footprint.
- The Non Examined Assessment work (NEA) allows students to develop their autonomy as a designer by exploring the designing and making principles of investigating primary and secondary data; researching the work of designers; communicating design ideas; prototype development; working with specialist tools, equipment and processes; and analysing and evaluating their work.

**The threshold concepts in our subject are:**

- The design process: Understanding and applying the iterative design process: creating a variety of design responses, developing and improving those ideas by reflecting, evaluating and acting on feedback from the target market or potential clients. Considering how a product will be used; its impact on the environment throughout its lifecycle; which materials may be suitable and how it can be produced.
- Creativity and innovation: Using various sources for inspiration including the natural world; the work of existing designers and architects; world cultures. Exploring a wide variety of design possibilities in order to come up with ideas which avoid design fixation and are not already commercially available. Recognising creativity and innovation in the work of existing designers is equally important.
- Understanding materials: Having an in depth knowledge of the different material areas: papers and boards; natural and manufactured timbers; ferrous and non-ferrous metals; thermoforming and thermosetting polymers; natural, synthetic, blended and mixed fibres, and woven, non-woven and knitted textiles. Understanding the sources of materials, material properties and potential uses and applications.
- Sustainability and the environment: Taking into consideration the environmental impact of a product throughout its lifecycle from raw material extraction, processing of materials, product manufacture, packaging, logistics, carbon footprint, end of life and recyclability.
- Mechanisms and systems: The functions of mechanical devices to produce different sorts of movement, changing the magnitude and direction of forces including levers, linkages and rotary systems. In electronic systems, understanding that

inputs, processes and outputs including programmable components provide functionality to products and processes, and enhance and customise their operation.

**In order to achieve a true understanding of Design and Technology, topics have been intelligently sequenced based on the following rationale:**

- The curriculum is centred around three domains of knowledge: practical knowledge, theoretical knowledge and disciplinary knowledge.
- The curriculum's underlying rationale is that everything we interact with in our daily lives has been designed (unless it is an organism). We are all consumers of products which have been designed. We teach students to become creative, innovative and responsible designers and consumers, who consider the target market for their designs and the impact their designs would have on the environment.
- Subject knowledge will build on the Key Stage Two national curriculum, ensuring that all students understand the core technical principles of the different material areas
- All students will interact and engage with the practical designing and making process, focusing on the importance of the iterative design process. Through a variety of creative and practical activities, pupils will be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They will work in a range of contexts.
- Students will use research and exploration, such as the study of different cultures, to identify and understand user needs, identify and solve their own design problems and understand how to reformulate problems given to them. They will develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations. Students will learn to use a variety of approaches to generate creative ideas and avoid stereotypical responses. Students will develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools. In the workshop, students will select from and use specialist tools, techniques, processes, equipment and machinery precisely. Students will analyse the work of past and present professionals to develop and broaden their understanding of design movements, product and fashion design. Students will learn about developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists to society.
- The level of rigour and challenge develops through each year and key stage and has been planned coherently, building towards cumulative substantive and disciplinary knowledge. The knowledge of the practical, theoretical and disciplinary elements of design technology builds in difficulty and complexity across the years. This has been mapped coherently across the curriculum. An example of this is in the teaching of a variety of decorative techniques on fabric in Year 7 and 8. Following this, students revisit their knowledge of decorative techniques and learn how to apply them to their own fashion design collection in Year 9. The core techniques, skills and knowledge are revisited and refined throughout KS3
- Students start KS4 with a sound knowledge base on which to begin their deeper studies of the world of design technology. Students are introduced to new and more detailed knowledge and skills that build on their prior experiences, using a range of additional strategies to support their progression as a designer.

**The Design Technology curriculum will address social disadvantage and actively seeks to tell the stories of the marginalised by:**

- Being designed around the most disadvantaged learners. We are careful not to assume any prior knowledge or cultural capital and always teach new knowledge explicitly. This allows for early intervention to be put in place to ensure that all students can access and thrive within the KS3 curriculum.
- The Education Endowment Fund report published in 2017 which examined the disadvantaged attainment gap in science is applicable to the study of D&T. Literacy level was shown to have the highest impact on progress in Science. Therefore in D&T we actively promote literacy in every lesson by explicitly teaching new vocabulary, and by reading and discussing challenging texts. We support our students to write in full sentences and by modelling sentence starters, giving adequate thinking time and using 'polite partner' work where appropriate. We ensure that all technical language is fully explored. Frayer models are used to ensure key words are fully understood and students can use the vocabulary in the correct context.
- Quizzing and formative assessment through 'Do Now, Review Now' and 'Exit Tickets' within every lesson allow teachers to identify gaps in knowledge and fill them through explicit re-teaching.
- We have the same expectations of all students who are taught the same rigorous curriculum. Everyone is given access to the same powerful knowledge, however teachers understand that some students may require additional resources to meet their needs.
- Design Technology is uniquely placed to allow students to explore and research social, moral, cultural and spiritual issues in relation to the products we interact with every day and their impact on the environment, and to consider how to become well

informed designers who take into account the principles of sustainability when designing new products. By exploring the work of previous designers, design movements and world cultures, our students become well informed citizens of the world.

**We fully believe Design and Technology can contribute to the personal development of students at Dixons Fazakerley Academy by:**

- Students at DFA have the opportunity to engage in modern D&T experiences, within the school curriculum. The intent is to develop students' technological awareness, capability and skills in order for them to function successfully in a multi technological society that is constantly evolving. During Years 7, 8 & 9 a rotation of disciplines allows the students to explore different manufacturing opportunities, skills and learning strategies with an aim to equip them to be able to make informed GCSE option choices as well as provide them with important life skills.
- All students are given the opportunity to develop a wide range of practical skills, whilst gaining valuable knowledge, positive values and attitudes in all the subjects within D&T; working with textiles, paper and board, timber, metals and polymers. Together with design methodologies and strategies this allows them to have a foundation to take into KS5, college, university and beyond. The curriculum is regularly reviewed to ensure that students at KS3 receive a broad range of knowledge upon which GCSE subject knowledge can be built.

**At KS3 and KS4, our belief is that homework should be interleaved-revision of powerful knowledge that has been modelled and taught in lessons. This knowledge is recalled and applied through a range of low-stakes quizzing and practice.**

**Opportunities are built in to make links to the world of work to enhance the careers, advice and guidance that students are exposed to:**

- Through the curriculum the students experience use of CAD and workshop equipment which reflects the ever-changing design industry and enables student to prepare for jobs that haven't been created. The world of D&T is ever changing and our curriculum gives students the foundation of design principles, and processes that can be adapted to whatever new technologies evolve. This reflects the industry of D&T on Merseyside and the North West, it is aligned with progression routes of local universities and other local training options.
- The North West is one of the areas in the country with the most job opportunities in the creative industries, construction and engineering. In D&T we raise awareness of these opportunities through curriculum content and educational visits.

**We teach beyond the requirements of the National Curriculum by:**

- Opportunities to study the work of designers throughout history and design movements of the 20th and 21st centuries are embedded into the curriculum. Students are encouraged to make links with prior and concurrent learning in maths, science, history, geography, IT and computing.
- Students are expected to reflect on the ethical, environmental, social and moral impact of design decisions and to consider how they can positively impact the world of design in the future.
- All students are given the opportunity to develop a wide range of skills, whilst gaining valuable knowledge, positive values and attitudes in all the subjects within D&T; working with textiles, paper and board, timber, metals and polymers. Together with design methodologies and strategies this allows them to have a foundation to take into KS5, college, university and beyond.