love the journey

Curriculum Implementation 2023-24

Secondary

LCA Strand	Technology, Enterprise & Sport
Subject	DT
Key Stage	Key Stage 5 (Chapter 12-13)

What are the key concepts taught?	Pupils build on the core knowledge developed at KS3 and 4. Pupils investigate historical, social, cultural, environmental and economic influences on design and technology, whilst enjoying opportunities to put their learning in to practice by producing prototypes of their choice. Students will gain a real understanding of what it means to be a designer, alongside the knowledge and skills sought by higher education and employers. • *Detailed Product analysis* - through a Product study students analyse the functional elements of products. They identify the strengths and weaknesses of the physical and mechanical properties of materials. • *Design development and product disassembly* – Dyson engineering box used to explore manufacturing methods used in industry. • *STEAM* - CEIAG links through the learning partnership. • *Understanding plastics* – quality control CAD/CAM skills development and prototyping skills. • *NEA example project* – Biomimicry inspired lamp, building on design creativity and links to inspirational designers, emphasis on prototyping. Having chosen their context and potential user(s) they then need to plan and carry out an extensive investigation into all aspects of the context in order that they might operate from a position of knowledge when making subsequent decisions. • *Dutch exchange program and collaborative project with Arcadis.* Students will be required to apply knowledge and understanding of a wide range of materials; including modern and smart materials, and processes used in product design and manufacture. They will be required to develop an understanding of contemporary industrial and commercial practices applied to designing and manufacturing products, and to appreciate the risks involved. Students should have a good working knowledge of health and safety procedures and relevant legislation. Students

	must have a sound working knowledge of the use of ICT and systems and control, including modern manufacturing processes and systems, and students will be expected to understand how these might be applied in the design and manufacture of products. Designers from the past provide inspiration for present and future designing. Students should be aware of the important contribution that key historical movements and figures have on modern design thinking. It is increasingly important that students develop an awareness of wider issues in design and technology, that design and technological activities can have a profound impact on the environment and on society and that these, together with sustainability, are key features of design and manufacturing practice. Mathematical and scientific principles are an important part of designing and developing products and students will be expected to apply these principles when considering the designs of others.

What is the sequencing of units?	In Chapter 12 pupils are introduced to complex CAD software through a design and make task during term one. Term two focusses on links to industry and collaboration with the Acadis group in the develop of designs for a set brief. In term three pupils complete component one and two of the Edexcel Product Design specification outlined below. Component 1: Principles of Design and Technology Assessment information • The assessment is 2 hours and 30 minutes. • The assessment is out of 120 marks. • Students must answer all questions. • The paper will include calculations, short-open, open-response and extended-writing questions. • The paper will include questions that target mathematics at higher-tier level in a GCSE Qualification in Mathematics. • Students must have calculators and rulers in the examination. Information regarding the use of calculators during the examinations for this qualification can be found in Synoptic assessment requires students to work across different parts of a qualification and to show their accumulated knowledge and understanding of a topic or subject area. Synoptic assessment enables students to show their ability to combine their skills, knowledge and understanding with breadth and depth of the subject. Component 2: Independent Design and Make Project The purpose of this component is to undertake a substantial design, make and evaluate project which will test students' skills in designing and making a prototype. The term 'prototype' means an appropriate working solution to a need or want that is

	sufficiently developed to be tested and evaluated (for example, full-sized products, scaled working models or functioning systems). Students are required to individually and in consultation with a client/end user identify a design possibility and design context from which they develop a range of potential solutions and then realise one through practical making activities. The project must allow candidates to apply knowledge and understanding in a product development process to design, make and evaluate prototypes. In this project, students will be encouraged to use creativity and imagination when applying iterative design processes to develop and modify designs, and to design and make prototypes that solve real world problems, considering others' needs, wants and values. There are no limits to project selection beyond the time and resources available and the appropriateness of selection in matching individual students' potential. Students are expected to take ownership of all aspects of their work in this project, in order to allow them total control of their responses and to target assessment criteria effectively, and to maximise their achievements. In order to reach high attainment levels, students must adopt a commercial design approach to their work, reflecting how a professional designer might deal with a design problem and its resolution. Mathematical and scientific principles are an important part of designing and developing products and students will be expected to be able to apply these principles when considering their designs and the designs of others. Please see Appendix 1: Mathematical skills requirement and Appendix 3: Science knowledge and skills requirement. This project will require students to follow the iterative design processes of exploring, creating and evaluating. The content and assessment criteria are set out in a linear format to show what is required of the total project. Assessment information • Internally assessed, externally moderated • The assessment will be carried out under controlled conditions, as specified on pages 33 to 36 of the specification. • First assessment: June 2019. • Students will produce a substantial design, make and evaluate project which consists of 120 marks • The project will consist of a portfolio and a prototype • The final prototype must be produced under immediate guidance or supervision. • The teacher responsible for overseeing the student's work must ensure that a Candidate Assessment Booklet* (CAB) is completed for each student. • The portfolio and CAB for each student in the sample must be sent to Pearson, in May in the year of assessment

How do we encourage pupils to see the links between different units and concepts?	• For each of the stages of the NEA, pupils will develop a set of skills that are revisited throughout KS4, deepening in complexity.

	• Pupils will be encouraged to see the links between different units and concepts through teacher questioning and class discussion. • Teachers will make links to prior learning. • Adapting exam board mark schemes into 'pupil speak' so that pupils understand the assessment criteria for specific units and the course as a whole. 'Walking' and 'talking' theory lessons to refer to exemplar material. • Pupils are passionate about the subject and are motivated to achieve high grades in the subject. Students are taught a range of creative thinking and design strategies to enable them to develop an independent approach to their learning. They are encouraged to take risks and develop solutions to complex problems.

What are the planned opportunities for adaptive teaching, including for SEND, the more and able and disadvantaged pupils?	Due to the nature of Design and Technology teachers build good relationships with every student and plan lessons which ensure that individual needs are met. Pupils receive one to one support with Safety and complex manufacturing techniques. **Differentiation** – Developed through collaborative planning to develop personalised learning for students with SEN in their understanding of subject specific terminology. Issues with mobility and engagement in practical activities are skilfully dealt with through detailed planning by experienced faculty staff. Scaffolded workbooks that support learners with a range of needs. **Support materials** are developed to support students across the key stages with their knowledge and understanding of numeracy and literacy in Design and Technology lessons. Adaptive methods of teaching and learning employed during all schemes at KS3 with the use of subject specific support sheets such as ACCESSFM to support learners. Pupil voice used to measure student engagement and attitude to the schemes and lessons. Faculty staff monitor behaviour and attitudes to learning. Dept reports used to monitor behaviour when appropriate. Extra-curricular clubs and competitions (success in Unilever competition). Students awarded certificates and trophies in recognition of their achievements. FIP used annually to analyse the curriculum and the impact on attainment in the dept. National data and school data used to identify and implement areas for improvement and establish changes required to improve teaching and learning. Schemes are renewed annually to assess the impact on pupil progress. Regular consultation with the department to establish the most appropriate ways to improve the quality of schemes and most appropriate way to deliver lessons that stretch and challenge the more able. As a result of work scrutiny, more challenging activities and differentiated work in Design and Technology lessons to challenge higher ability students, with a focus on Maths and Science content in design lessons. Challenging

	the curriculum intent, to ensure all areas are offering an engaging curriculum. Pupils receive written and verbal feedback on their electronic design portfolio and practical work. Intervention for individual and small groups of pupils focussed on specific needs. Design and Technology and Engineering teachers have shared access to all units of work and resources through Microsoft Teams so that adaptations can be made according to pupil need. SEND – use of pupil profiles and SEN strategies to adapt learning according to pupil need. More able pupils – more complex subject specific terminology linked to industrial contexts. Access to wider reading in the College library and via online learning resources such as Technology student. Questioning is built into starter and plenary activities as well as continuously as the lesson progresses. Questioning is encouraged during peer and self-evaluation time. Misconceptions are met successfully through the use of teacher explanations, pupil to pupil interaction, research and feedback.

What are the planned opportunities for retrieval and reflection by pupils?	• 'Do Now' retrieval practice tasks • Focussed practical skills tests. • Three week test in Chapter 12. • Summative 'Progress Point' assessments revisit skills and indicate retention of learning. • Links to prior learning • knowledge organisers, toolkits and revision aids in a variety of formats • Boxed learning revision worksheets used to support and assess learning.

What are the opportunities for feed forward by the teacher post assessment outcomes?	• Progress Point 'PP' assessments and mock exams to inform their future planning and teaching. • Use of a centralised faculty marksheet to track pupil progress. Analysis of outcomes will inform pupil intervention, teacher lesson planning and revision. • Pupils record Progress Point 'PP' assessments on a tracker sheet so that they can monitor their progress across different units during the course. • Teacher feedback on pupil responses is in line with guidance from AQA NEA. • Use of external examination data and examiner reports to identify areas of focus for the coming academic year which is then built into lesson planning.

	• Summative Progress Point 'PP' assessments and mock exams are marked by experienced teachers which allows the identification of trends and patterns across the cohort and course which is then fed back to the faculty and pupils. • Use of external examination data, examiner reports and NEA moderator feedback to identify areas of focus for the coming academic year, which is then built into lesson planning.

What are the planned opportunities for developing Reading?	• Pupils use Design library in the department to develop their knowledge and understanding of key designers through out the course of the 2 years. • Use of the College Library for additional reading • Reading lists related to and beyond the course of study

What are the planned opportunities for developing literacy, numeracy, oracy and SMSC?	**Literacy:** • LC Tests and 'Do Now' retrieval practice tasks e.g. focussed on key vocabulary/terminology, spellings, grammar • Literacy mats and resources provided a key point in the GCSE course. • command words that will be used in the examination for this qualification and their definitions discussed in theory lessons and revision sessions. **Numeracy**: Extensive links to mathematics and numeracy through the use of digital modelling. Numeracy mats provided by all staff to support learning in Design lessons. Embedded in to schemes of work and all practical activities. **Mathematical skills** requirement Potential applications a Confident use of number, percentages and percentiles Calculation of quantities of materials, costs and sizes. Use of ratios Scaling drawings. Calculation of surface areas and/or volumes Determining quantities of materials. Use of trigonometry Calculation of sides and angles as part of product design. Construction, use and/or analysis of graphs and charts Representation of data used to inform decisions and evaluation of outcomes. Presentation of market data, user preferences, outcomes of market research. Use of coordinates and geometry Use of datum points and geometry when setting out design drawings. Use of statistics and probability as a measure of likelihood Interpret statistical analyses to determine user needs and preferences. Use data related to human scale and proportion to determine product scale and dimensions. **Oracy:** • Class and small group discussion • Design eras presentations • Architectural presentations to KS3 students. **SMSC**:

	Social, moral, cultural issues embedded into schemes of work across the faculty. Discussion embedded into lessons in all Keystages. Pupils participate in a range of activities which discuss the use of Resistant Materials and the positive and negative impacts of these materials in the environment. The Design and Technology curriculum outlines that students should also understand the social and cultural impact of the manufacturing industry. Pupils discuss these issues and integrate them into their design work to establish an ethical solution to the set brief.