**Design Technology Key Stage 4 Curriculum 2023 - 2024**

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|  | Year 10 | | | Year 11 | | |
|  | Knowledge and skills | Enrichment | Additional information e.g. Cross- Curricular | Knowledge and skills | Enrichment | Additional information e.g. Cross- Curricular |
| Cycle 1 | * Production techniques and systems – automation * Enterprise * Market pull and technology push * People, society and culture * Sustainability and the environment * Critical evaluation of new and emerging technologies – planned obsolescence * Design for maintenance * Investigate, analyse and evaluate the work of past and present designers/ companies * Renewable and non-renewable resources * Energy generation and storage * Systems approach to designing * Mechanical devices * Developments in new materials * Materials and their working properties Ecological and social footprint * Using and working with materials * Commercially available types and sizes of materials * NEA style project (initial research, specification, initial ideas) Alessi key fob (10 lessons)   **HW:**   * Categories of polymers – the differences in their properties and how they are utilised. (Alessi project) * Manufacturing techniques – rotational moulding, injection moulding, vacuum forming, etc. (Alessi project) * The use of additives and fillers. * Stock forms. * Adhesives used with polymers. (Alessi Project)   **Ethos and Vision**  Students learn about environmental, ethical and social issues in relation to the design, manufacture, use and disposal of products. | STEM activity  Life cycles  [Life Cycle Assessment(LCA) | KS3 KS4 Free Teaching Resource (stemcrew.org)](https://www.stemcrew.org/resources/life-cycle-assessment/) | Problem solving and decision making involved in development of design ideas  Careers: Graphic designer | Completion of individual NEA projects: It’s intended to be an iterative process so the learning activities will be directed by the student and will depend on their project. (13 week cycle 32 hours)  **HW:**  Revision of key topics  Ongoing research to inform NEA project  **Ethos and Vision**  Completion of NEA to secure qualifications | STEM activity  Modern materials  [Smart and Modern Materials: Design technology | STEM Crew](https://www.stemcrew.org/resources/modern-materials/) | NEA is based on students solving a genuine problem they have identified Design element requires students to use decision making  Careers: Architect |
| Cycle 2 | * Specialist techniques and processes * Material Management * Quality control * Ethical and social issues * Surface treatments and finishes * Forces and stresses * NEA style project 2 (Using primary and secondary data to understand client and/or user needs. Interviews, constraints. Writing a design brief and specifications)   Desk tidy project (woods)  Practical work: 3D Prototypes. Marking out, cutting using electric fret saw and hand tools. Wood joints, filing, drilling and using glass paper with a sanding block. Adding a finish.   * **HW:** Categories of woods – characteristics of the trees, properties and uses. * The life cycle of wood. * Manufactured boards- advantages/disadvantages. * Production methods-wood turning, manipulating flexi ply, etc. * Stock forms. * Finishes for woods and manufactured boards. * Adhesives used with woods and boards. * Recycling issues.   **Ethos and Vision**  Understanding the needs of a range of users. | STEM activity Mechanisms  [Mechanisms Teaching Resource | Pressure Force Area Worksheet (stemcrew.org)](https://www.stemcrew.org/resources/mechanisms/) | Problem solving and decision making involved in practical lessons  Careers: Product development | * Completion of NEA project (final evaluations and photographs of made outcomes) * Exam revision according to assessments of class needs   (12 week cycle 30 hours available. Time for NEA: 10 hours )  **HW:**  Revision of key topics  Ongoing research to inform NEA project  **Ethos and Vision**  Completion of NEA to secure qualifications | STEM research materials  [Materials and their uses. Key Stage 3 & 4 teaching resources (stemcrew.org)](https://www.stemcrew.org/resources/materials-and-their-uses/) | NEA is based on students solving a genuine problem they have identified Design element requires students to use decision making  Careers: web design |
| Cycle 3 | * Design strategies * Communication of design ideas (drawing techniques) * Selection of materials and components * Tolerances * Using and working with materials * Surface treatments * Completion of NEA style project 2 (design development, prototypes, evaluation) * Introduce context for 2023 submission   **HW:**   * Categories of metal, alloys. * Production methods – die casting, spinning, lathe, sand casting, etc. * Stock forms. * Metal ore extraction process. * Permanent/temporary joining methods. * Finishes for metals. * Recycling issues.   **Ethos and Vision**  Develop understanding of the needs of others | Research a designer that inspires you – what is their background? What do you find inspiring about their work? Design a product in their style. | Problem solving applying perspective in drawings  Careers: trades people (carpenter etc) cross curricular link with construction | * Exam revision according to assessment of needs.   **HW:**  Revision  **Ethos and Vision**   * Completion of NEA to secure qualifications |  |  |