**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 ideasCareers: 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 topicsOngoing research to inform NEA project**Ethos and Vision**Completion of NEA to secure qualifications  |  STEM activityModern 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 lessonsCareers: 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 topicsOngoing 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 drawingsCareers: 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
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