DESIGN AND TECHNOLOGY CURRICULUM OVERVIEW

Key Stages 3 & 4

YEAR	TOPICS	TERMLY INDEPENDENT WORK
7	The Year 7 scheme of work has been developed to enable students to further their capability in Design and Technology. Students are taught to recognize and explore user needs and wants (that can be met through D&T activity) develop ideas about how this might be achieved and develop designs/product that meet those needs. **Year 7 D&T will develop a repertoire of skills and knowledge including:** **- Research and Design.** **- Knowledge of materials and basic electronic components.** **- Knowledge of workshop Health and Safety, through sometimes practical learning** Teaching is based around three different focus areas in year 7… **Focus 1. Graphic presentation.** The following skills are introduced and practiced: • 2D sketching and Orthographic drawing presentation. • Meeting simple design constraints. • Communicating different design ideas. • Communicating math measurements to British Standards. • Computer Aided Design. **Focus 2. Key fob torch.** Through this design and make project, the following are developed: • Working to a manufacturing specification. • Prototyping outcomes. • Demonstrating safe working practices in the workshop. • Use of simple manufacturing aids (Templates). • Adopting a methodical approach to problem solving. • Self and peer assessments. • Understanding of simple electronic circuits, components and variables.	- Communication of own design proposals. - Investigating existing products. - Investigation of material properties. - Analysis of customer needs. - Practical outcome where permitted. - Computer aided outcomes. - Revision resources compiled. - Ongoing homework via online TEAM facility.

7	• Ongoing evaluation of outcome. **Focus 3. Knowledge theory.** Throughout year 7, theory is learnt and revised in order to introduce GCSE style questioning with an understanding of the following topics throughout the year: • Material properties (Plastic, Styrofoam, electronic components). • Budgeting for customer need practice. • Identifying workshop hand tools and their purpose. • Electronic components and their function. • Ergonomics. • Recognising the benefits of CAD and CAM (Computer Aided Design/Manufacture). • Iterative research and investigation. • Investigation into historical movements. • 1 hour exam during whole school assessment week. • All pupils get the chance to mark work, in order to benefit their assessment understanding. **Year 7. Competitions to support curriculum.** Remembrance poppy design competition (Whole year group).	
8	The Year 8 scheme of work aspires to further pupil capability in Design and Technology. Students are introduced to experimenting with mock coursework pages, in order to test their aptitude and interest for potential GCSE studies. Pupils choose to continue with D&T at the end of year 8 (this is not a firm commitment to GCSE). • Designing and making. • Working knowledge of materials and components. • Knowledge of product quality checks and Health and Safety. • Developing designs and prototypes.	- A3 Mock GCSE coursework page layout practice. - Investigation and analysis of existing products. - Rendered design proposals suited to GCSE standards. - Develop practical prototypes, where permitted. - Upcycling materials. - Computer aided outcomes. - Own revision resources compiled. - Ongoing homework via online TEAM facility.

8	• 1 hour D&T exam during whole school internal assessment week. Teaching is based around the following areas… **Focus 1. Graphics presentation.** The following skills are revisited from the previous year: • 2D sketching and Orthographic drawing presentation. • Meeting simple constraints, to meet user needs. • Using Math skills in design. The following skills are introduced and practiced: • Communicating using 3D isometric drawing. • Use of mathematical angles for drawing techniques. • Enhanced rendering to communicate higher design detail. • Begin A3 Mock GCSE coursework pages. • Testing design skills for commercial purpose. **Focus 2. Decorative Picture frame.** Through this project, the following D&T skills are developed: • Rendering different materials. • Understanding the properties of a range of plastics. • Identifying the uses of plastics and environmental concern (6R's). • Appreciating the work of others. • Computer aided design and manufacture. • Manipulation of the plastic form, where practical work is permitted. • Safe working practices. • Finishing plastic using hand techniques (Comparison against C.A.M) where permitted.	

8	• Isometric drawing. • Evaluation skills. **Focus 3. Knowledge theory.** • Material properties (plastics, electronic & textiles). • Workshop hand tools, machinery and their function. • ACCESS FMM key terms. • Specification writing. • Math and Science related questions. • Extended long answer GCSE practice. • 1 hour exam during whole school assessment week. **Year 8. Competitions to support curriculum.** - Recycling plastic competition (Whole year group). - Selected pupils form teams & attend the local BAE Rotary competition. - Weekly Architecture club available to support career ambitions.	
9	In year 9, smaller D&T class sizes allow for enhanced practice and complex practical explorations, with a view to promoting continuing into year 10 and 11 GCSE studies. The Year 9 scheme of work has been developed with guidance from the exam board AQA SOW model, designed to allow pupils to broaden their knowledge and practice of theory required for GCSE. • Designing. • Making with increased workshop use. • Building upon working knowledge of an array of materials and their properties. • Understanding of commercial production.	- Develop A3 Mock coursework portfolio. - Enhanced presentation of design proposals. - Understanding some commercial application of manufacturing techniques. - Development and modelling of design proposals where permitted, in a variety of materials. - Ongoing modifications and improvements to theory. - Formal evaluation to support reasons for adaptions. - C.A.D & C.A.M. - Own revision resources compiled.

9	• Knowledge of assessing quality and Health and Safety. • Knowledge of smart and modern materials. Teaching is based around three focus needs as follows… **Focus 1. Mechanical Structure / Mirror Design / Stamp Prototype** Projects combine theory and practical: • Understanding of market forces and assessing client needs. • Investigation into mechanical toys and motions. • Written design and manufacturing specification practice. • Recognising some timbers, plastics tools and finishes. • Understanding man-made board and stock forms. • Use of CAD/CAM techniques. • Designing when considering forces applied to material/products. • Improved quality checking capability. **Focus 2. Mock coursework** Ongoing practice of suitable coursework content throughout Year 9, in order for pupils to determine coursework assessment criteria, which accumulates 50% of GCSE in higher years: • Working in large scale format through iterative process where permitted. • Enhanced development into isometric sketching and render. • Understanding of commercial use of production aids, give repeated accuracy and save time. • Third party testing and collecting primary research/data. • Computer Aided Design and manufacturing processes. **Focus 3. Knowledge theory** Ongoing knowledge throughout year 9, consolidating 3 year KS3 course: • Timbers, manufactured boards & plastics. • Commercial processes, systems & viability. • Mechanisms, forces and motions. • The work of others continued. - Workshop management	- Ongoing homework via online TEAM facility.

	• Scales of Production. • 1 hour exam during whole school assessment week. **Year 9. Competitions to support curriculum** - Participation in year 10 hosted competition. - Selected pupils form teams & attend the local BAE Rotary competition. - Weekly Architecture club available to support career ambitions.	
10	The scheme of work has been developed to allow students to demonstrate fully their Design and Technology capability, using the AQA guidance SOW module designed for a 2-year course. Year 10 pupils should master their mock coursework/NEA and commence final NEA in June this year. • Analysing and evaluating products and processes. • Engaging in focused tasks to develop and demonstrate tasks. • Engage in strategies for developing ideas, planning and producing products. • Manage own project and ability to meet time scales. **Four broad areas are studied throughout year 10 D&T.** • Materials and components. • Designing and making skills. • Design and market influences. • Processes and manufacture, where practical is permitted. • Consolidated in 2-hour exam during whole school assessment week.	- Develop working knowledge of materials and their uses. - Investigating commercial production techniques. - Evaluation and analysis of existing products. - Modelling and presentation of design ideas. - Project planning. - Development of design proposals with regard to consumer requirements and suitability for volume production. - Evaluation of outcome taking into consideration user group opinion and modifications. - Reviewing of theory topics. - Mastered coursework practice pages with array of personal examples to use as aids to benefit live NEA and year 11. - Ongoing homework via online TEAM facility.

10	**Materials and components.** Classification and working properties of materials. • Paper and card. • Identify common papers including layout, sugar, tracing, corrugated and foam centred board. • Understand many papers are composites and composition can be adjusted to alter properties. • Timber based material. • Identify common timbers such as pine, mahogany, oak etc. • Identify common manufactured boards i.e. MDF, plywood, chipboard and hardboard. • Plastics. • Identify common thermoplastics i.e. polystyrene, acrylic and PVC. • Identify common thermosetting plastics i.e. GRP and epoxy resin. **Designing and Making Skills.** Through this study, the following are developed, through mock coursework: • Consolidate design principles of line, form and colour. • Develop and use design briefs, detailed specifications in relation to product development, testing. • Design for product maintenance. • Self-assess and seek the opinion of others during the iterative process. • Match materials and components with tools, equipment and processes. • Product disassembly. • Make decisions when deciding how to manufacture a product. • Produce and use detailed working schedules and set realistic deadlines. • Ensure the quality of design solutions is suitable for consumer.	

10	• Use tools and equipment safely, accurately and efficiently to achieve reliable functioning of product, where permitted. • Use computer aided manufacture (CAM) in single and batch production. • Tolerance and quality control. • Surface treatments and finishes. **Design and Market Influences.** • Consider the evolution of product design. • Recognise that products evolve over time and the reasons. • Understand market pull and technology push. • New and emerging technologies. • Discuss and analyse situations / problems. • Analyses trends and form predictions / conclusions. • Consider safety with regards to themselves and the product user/s • Costings and financial implications. • Be aware that designs are protected by patents. • Communicate ideas, using a range of graphical techniques (including orthographic and isometric). **Processes and Manufacture.** • Practice manufacture, where permitted. • Understand how a range of materials are cut, shaped and formed. • Understand different scales i.e. one-off, batch and mass production. • Analyse what effects manufacturing (ie organisation of people, tools and materials). • Forces and stresses. • Energy generation and storage. • Use a range of procedures including CAD/CAM to ensure consistency in production.	

10	• Use hand and machine methods of cutting and shaping materials. **Please note, theory learnt in years 7-9 to be revisited and consolidated to benefit KS4 GCSE.** **Knowledge theory** Theory runs throughout Year 10, in support of both coursework and examination. Two formal mock assessments are undertaken in January and June, both at two-hours each. **Year 10 Projects** The main projects used during Year 10 to deliver the above knowledge and skills are: • Charity graphics and mathematical net development. • Themed board game of pupil choice. • Computer aided design task/s. • Live NEA – Begin 1st June (View to completing 20% before summer) **Live NEA** AQA release the NEA coursework choices every year 1st June for pupil to choose from. In line with the changes to the GCSE specification, pupils must choose their option and self-manage their NEA worth 50% of their grade. Therefore, early distribution of AQA options essential to maximise time at the end of year 10 (Taking into account school early closure in July). The project consists of a three-dimensional product and a concise design folder. Coursework lessons should run alongside theory lessons in order to benefit entries/content made to NEA. Plan to complete 20% of live NEA before end of year 10. **Year 10. Competitions to support curriculum** - Year 10 host design and host a competition designed to encourage year 9.	- Live NEA outcomes year 10 Focus on GCSE section A and B and commence work on section C (Design communications) ahead of the summer break.

	- Year 10 design challenge, winners outcome displayed in department. - Industry collaboration into a variety of career paths (LIPA Liverpool), trip if permitted, otherwise online. - Selected pupils form teams & attend the local BAE Rotary competition.	
11	During Year 11, students will complete their NEA project marked by the school and externally moderated, amounting to 50% of the total mark for the GCSE. Operating three lessons a week, two are usually denoted to NEA and the third for ongoing theory. NEA to be completed by February (Both then internally & externally marked). Thus allows ample time for final theory revision and support other academic subjects and internal mocks. Important move to permit significant time to cover theory and revision lessons, to engage pupils in robust GCSE specification content as set by the examination board, AQA. 1 x year 11 mock exams, during whole school assessment week in February, totaling 2 hours. **Knowledge theory** • Ferrous and non-ferrous metals. • Identify common metals i.e. mild steel, brass, copper and aluminium. • Understand many metals are alloys and their composition can be adjusted. • Textiles and electronics . • Identify natural and synthetic materials. • Understand components within basic and more complex systems. • Students are, by this point, experienced in different types of questioning and have chance to engage in school revision lessons before their final examination, usually in June of Year 11.	- Consolidation of all paper-based tasks in controlled assessment. - approximate 20 x A3 NEA coursework pages - Review and revision of theory topics. - Ongoing homework via online TEAM facility.

	Year 11. Competitions to support curriculum - Participation in year 11 revision competition (Weekly tally across 2 month) designed to motivate and engage pupils in independent revision.	

PLEASE NOTE:

- This broad curriculum is designed with the AQA D&T specification in mind (First examination year 2019).
- This overview sets out a general summary of the basic curriculum taught. It is not an exhaustive list of what may be taught and subject teacher/s may follow the above in a different order taking account of resources and facilities available, changes and consideration of the unique cohort must be reflected upon.
- The course may change during the year to also take account of new learning opportunities and initiatives.
- KS3 year 7-9 are taught a single lesson per week therefore overlaps in learning do apply to allow for the mastery of learning across years.
- The Independent work indicated represents core, headline tasks per term; weekly/fortnightly independent/personal study is set in all subject areas and details are noted in pupil planners and will be loaded onto homework TEAM online facility for all year groups.