DESIGN AND TECHNOLOGY CURRICULUM GUIDES

Our Curriculum Aims at KS3 for Year 7,8 and 9:

1. To stimulate and maintain student interest, enjoyment, curiosity and concern about technological aspects of the environment, both local and international in Design and Technology.
2. To enable students to become familiar with the knowledge, principles, skills and vocabulary of Design and Technology along with a developed knowledge of different categories of materials (smart) and their properties.
3. To enable students to be confident and competent in "design for purpose" and making quality products which are "fit for purpose".
4. To enable students to evaluate and improve upon a design or product as well as considering the needs of the user and evaluating it against specification criteria.
5. To develop an awareness of the role of Design and Technology in the development of the modern world and emerging new technologies and their impact upon the planet and the human race.
6. To develop an enjoyment in risk-taking, creativity, innovation and problem solving of technological problems.
7. To develop the skills which enable students to make reasoned decisions about the implications of technological advances and to apply principles of nutrition and health to improve their lifestyles?
8. To develop through Design and Technology a range of desirable personal qualities that will enable students to become confident, committed and co-operative members of society.
9. To reflect and draw upon the work of past and present designers and design movements along with gaining inspiration from other sources such as nature.
10. To develop a wide technical vocabulary whilst promoting good literacy skills

Key Stage Three Curriculum Overview

Pupils will follow a rotation where they will study the following topics alongside Food and Nutrition for approximately 1/3 of the year which covers HT 1 and 2, HT 3 and 4 and HT 5 and 6 respectively.

Year 7

	Name of topic	Key Content of the Topic	Assessment points
HT 1 HT 2	An introduction to electronics:	• Soldering • PCB Construction • Simple transistor circuits • Vacuum Forming	FEDS (See Below)
HT 3 HT 4	An introduction to mechanisms:	• Materials and Processes • Manufacturing Techniques • Industrial batch production • Quality control	FEDS (See Below)
HT 5 HT 6	Product Design:	• Materials and Processes • Project Management • Iterative Design • Modelling	FEDS (See Below)

Year 8

	Name of topic	Key Content of the Topic	Assessment points
HT 1 HT 2	Graphics and presentation techniques:	• Pencil crayon rendering • Packaging • Labelling and Advertising • Quality Control	FEDS (See Below)
HT 3 HT 4	Innovation and Product Design:	• Creativity techniques • Innovative products • Smart materials • Iconic designers	FEDS (See Below)
HT 5 HT 6	Structures – Medieval Siege Warfare:	• Forces • Triangulation • Historical manufacturing techniques • Siege engine design	FEDS (See Below)

Year 9

	Name of topic	Key Content of the Topic	Assessment points
HT 1	Electronic Systems:	• Microcontrollers • Software engineering • Embedded systems • Programming • Flowcharts • User Centred Design • Electronic Products	1-9 GCSE, e-portfolios are graded according to the AQA GCSE mark Scheme
HT 2			
HT 3			
HT 4	Product Design:	• Trigonometry • Research techniques • Modelling and Iterative Design • Development techniques • Manufacturing processes • Product testing and evaluation	1-9 GCSE, e-portfolios are graded according to the AQA GCSE mark Scheme
HT 5			
HT 6			

All projects are marked formally on completion using the FEDS sheets (Year 9 against GCSE grading criteria) and certain aspects are verbally marked at half- way depending on the project in progress. Feedback can be requested verbally at any point in a project or in written form via email or via Microsoft Teams. Feedback will be diagnostic and will be related to the shared learning goals outlined on the subject achievement map for each project. Homework will be set according to the homework policy and will be related to the current project being carried out. Pupils will be expected to self-assess according to the FEDS evidence prior to submitting their final projects for assessment.

What can parents do to support their sons at KS3?

There is a valuable web resource at *www.technologystudent.com* that provides animations and explanations of the things that are covered in lessons. Updated and useful links can be found on the Design and Technology sections of Sharepoint in Office 365.

More specifically in:

Year 7:
You can use *www.printfreegraphpaper.com* to generate isometric grid paper to aid your sons sketching.

Year 8:
Visit *www.technologystudent.com* to assist in the research of structures.

Year 9:
Download the PICAXE editor from https://picaxe.com/getting-started/software-selection/ as this will allow your son to work on his software design at home.

Any code that is generated can be uploaded to O365 and tested in class.

Monitor the work of your son during the Product Design tasks to ensure that work is being completed within the e-portfolio as set out on Satchel One. These projects are designed to run like GCSE courses so that your son can make informed choices at options time. This means that they will be responsible for many of the deadlines and target setting. Please reinforce the importance of meeting deadlines set via Satchel One.

Use the FEDS Descriptors to look at what evidence you should be able to see in the e-portfolios that are being produced.

Key Stage Four Curriculum Overview

GCSE Course Followed: Design and Technology
Specification: AQA (syllabus code 8552)

Why Choose GCSE
Design and Technology is about solving problems in the real world. AGSB students develop advanced design skills and gain an enhanced understanding of the nature of Engineering. Throughout our curriculum, and in exciting extracurricular work, students find creative solutions to real Engineering problems. Our two new courses at GCSE emphasise the multidisciplinary nature of Engineering and the links between Engineering design, Science and Mathematics. They also build upon the skills developed in Year 9 and provide a deeper insight into the multifaceted nature of engineering problem solving in preparation for University level study in any technical discipline.

Our students and staff routinely use the latest Engineering design and rapid prototyping tools, and are passionate enthusiasts of Robotics, Microelectronics, and a new push into the Internet of Things. AGSB technologists are regularly awarded the prestigious Arkwright Scholarships in Engineering. Our students have the freedom to complete ambitious and demanding Engineering design projects that are frequently indistinguishable from A-level work. 90% of our students achieve a 9-7 grade.

The assessment of the new Design and Technology course is a split between a Non-examined Assessment worth 50% and a written paper worth 50%.

In the summer term of Year 10, students will be expected to choose a project from a range of contextual challenges provided by the examination board. They will then spend 30-35 hours working through the project to a practical outcome. Students may work with any technology available to solve the problem from state-of-the-art embedded electronics through to 3D printed parts. A portfolio of design evidence will be produced alongside this problem-solving task. The written exam will be 2 hours in length at the end of the course and will examine core technical design principles together with a short design question. 15% of this examination will test the candidate's ability to apply mathematics and science principles to solve real world engineering problems. A support structure is in place so that pupils can book specific time slots for 1:1 feedback both during and outside of lesson time.

Key Stage Four Curriculum Overview

Year 10

	Name of topic	Key Content of the Topic	Assessment points
HT 1	Practical Skills Graphical Skills Theory Content	The start of the theory content will be delivered alongside the coursework and any practise pieces. The first task is a skills-based project focussing on 5 separate skills	GCSE 1-9* see description below
HT 2	Manufacturing Design Challenge	Using the knowledge gained in HT1, Pupils will apply this to solve a particular design and make problem from a set list. Examples include LED mood lighting and Passive Speakers.	
HT 3	Completion of the project alongside the Theory	The 1st Design project is completed and presented whilst continuing to cover the theory content required for the examination.	Theory is assessed via homework questions and low stakes timed tests given weekly.
HT 4	Research and Problem identification practise	In order to prepare for the NEA (Non-examined Assessment), pupils will carry out a mock Section A to identify and research a particular problem.	
HT 5	NEA	The coursework is formally launched and commences based on the practice done in HT4. Theory consolidation continues.	Trial Exam
HT 6	NEA	Research, Investigation and Design Specification must be completed before the end of this term.	

Year 11

	Name of topic	Key Content of the Topic	Assessment points
HT 1	NEA	The whole year is spent completing the NEA which is worth 50% of the course alongside times tests to ensure that factual recall is at the required standard.	GCSE 1-9 * see below
HT 2	NEA Manufacture	Revisit key theoretical concepts	
HT 3	NEA completion		
HT 4	NEA completion and evaluaton		20 Page e-portfolio 35 hours
HT 5	Revision	The theory content is revisited to ensure that no gaps exist. Pupils must work often to recall the key facts.	
HT 6	NA		GCSE exams

Recommended Revision Guides for GCSE

AQA Product Design textbook issued by the department.

Support available for GCSE Students

Lunchtime sessions are available every day in T2 for pupils to work on projects. Bookable 1:1 time see Mr Baker.

*Practical Work is marked according to the GCSE marking criteria and formative assessments are offered. Students are encouraged to record the feedback sessions and act upon the suggestions in the form of a self-evaluation. Project

work is assessed depending on the category submitted and is graded numerically according the the AQA mark scheme. Personalised feedback is offered both verbally and in written format throughout Year 10 so that pupils are well prepared for the NEA task and can undertake it independently. Personalised feedback in Year 11 is prohibited under NEA guidance but general feedback to the class based on submissions can be expected after each deadline set on Satchel One. Homework is set in line with the homework policy.

Key Stage Five Curriculum Overview

Key Stage 5 Design and Technology Specification: Pearson Edexcel (9DT0)

Why Choose A-level?
Design and Technology is about solving problems in the real world. AGSB students develop advanced design skills and gain an enhanced understanding of the nature of Engineering. Throughout our curriculum, and in exciting extracurricular work, students find creative solutions to real Engineering problems. Our course at a-level emphasises the multidisciplinary nature of Engineering and the links between Engineering Design, Science and Mathematics.

The aims and objectives of this qualification are to enable students 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 their own and others' needs, wants, aspirations and values.

● identify market needs and opportunities for new products, initiate and develop design solutions, and make and test prototypes.

● acquire subject knowledge in design and technology, including how a product can be developed through the stages of prototyping, realisation and commercial manufacture.

● take every opportunity to integrate and apply their understanding and knowledge from other subject areas studied during Key Stage 4, with a particular focus on science and mathematics, and those subjects they are studying alongside A Level Design and Technology.

● be open to taking design risks, showing innovation and enterprise while considering their role as responsible designers and citizens.

● develop intellectual curiosity about the design and manufacture of products and systems, and their impact on daily life and the wider world.

● work collaboratively to develop and refine their ideas, responding to feedback from users, peers and expert practitioners.

● gain an insight into the creative, engineering and/or manufacturing industries.

● develop the capacity to think creatively, innovatively and critically through focused research and exploration of design opportunities arising from the needs, wants and values of clients/end users.

● develop an in-depth knowledge and understanding of materials, components and processes associated with the creation of products that can be tested and evaluated in use.

● be able to make informed design decisions through an in-depth understanding of the management and development of taking a design through to a prototype.

● be able to create and analyse a design concept and use a range of skills and knowledge from other subject areas, including mathematics and science, to inform decisions in design and the application or development of technology.

● be able to work safely and skilfully to produce high-quality prototypes.

● have a critical understanding of the wider influences on design and technology, including cultural, economic, environmental, historical and social factors.

● develop the ability to draw on and apply a range of skills and knowledge from other subject areas, including the use of mathematics and science for analysis and informing decisions in design.

Key Stage Five Curriculum Overview

Year 12

	Name of topic and key content Mr Baker	Name of topic and key content Mrs Lightowler	Assessment points
Term 1	Topic 1: Materials Topic 2: Performance characteristics of materials Topic 3: Processes and techniques Topic 7: Potential hazards and risk assessment	Topic 4: Digital technologies Topic 5: Factors influencing the development of products Topic 9: Designing for maintenance and the cleaner environment	Timed low stakes testing, NEA submission, e-portfolio evidence.
Term 2	Topic 6: Effects of technological developments Topic 8: Features of manufacturing industries	Topic 9: Designing for maintenance and the cleaner environment NEA Launch	Examination questions will be set for some homework tasks
Term 3	NEA Coursework	Topic 10: Current legislation NEA Coursework	Internal exam

Year 13

	Name of topic and key content Mr Baker	Name of topic and key content Mrs Lightowler	Assessment points
Term 1	NEA Coursework	NEA Coursework	EDEXCEL Criteria (see below)
Term 2	Topic 11: Information handling, Modelling and forward planning Topic 12: Further processes and techniques.	NEA Coursework	40xA3 Pages e-portfolio format.
Term 3	REVISION NEA Evaluation	REVISION	External Exam

Practical Work is marked according to the A-level marking criteria and formative assessments are offered. Students are encouraged to record the feedback sessions and act upon the suggestions in the form of a self-evaluation. Project work is assessed depending on the category submitted and is graded numerically according the the EDEXCEL mark scheme. Personalised feedback is offered both verbally and in written format via email throughout Year 12 and 13 so that pupils are well prepared for the NEA task and can undertake it independently. Personalised feedback in Year 13 is prohibited under NEA guidance but general feedback to the class based on submissions can be expected

after each deadline. Homework is set in line with the policy and independent working tasks should be completed in private study such that for each hour of taught content, pupils carry out an hour of independent work.