



Year 10

Curriculum Booklet

2022 - 2023

Contents

INTRODUCTION	2
GUIDANCE ON PROGRAMME OF STUDY	3
GCSE ART	4
GCSE BUSINESS	5
GCSE COMPUTER SCIENCE	6
GCSE ELECTRONICS	7
GCSE ENGLISH LANGUAGE	8
GCSE ENGLISH LITERATURE	9
GCSE GEOGRAPHY	10
GCSE HISTORY	11
GCSE MATHEMATICS	12
GCSE SCIENCE (COMBINED)	13
GCSE SCIENCES (TRIPLE)	14
CAMBRIDGE NATIONAL ENGINEERING DESIGN	15
CAMBRIDGE NATIONAL ENGINEERING MANUFACTURE	16
CAMBRIDGE NATIONAL ICT	16
GCSE FURTHER MATHS (ENRICHMENT)	18

INTRODUCTION

We are very pleased to welcome your child to WMG Academy and are delighted that they have chosen to complete their key stage 4 study with us.

As part of the programme of study at the Academy, students will study a core curriculum of Maths, English Language, English Literature, Double Science and GCSEs alongside a Level 2 (GCSE equivalent) in Engineering Manufacture. Additional choices will complement the core programme of study by choosing three option subjects. Currently, Further Mathematics GCSE is offered as an extension qualification to our most able Mathematicians.

On induction at the age of 14, all students completed baseline assessment to determine setting and target grades. This data is made available for you at our 'settling in parents' evening in the early part of Year 10.

We hope that the next two years go well and that all students develop into young engineers of the future. We recognise that our students can only be successful if they continue to be supported by their parents throughout years 10 and 11. Please do not hesitate to contact us with any questions and we look forward to working together.

GUIDANCE ON PROGRAMME OF STUDY

The WMG Academy for Young Engineers understands the complexity of choosing your programme of study and has prepared the following support to assist you:

STEP 1: COMPLETE SUPPORTING DOCUMENTS AND SEND REPORT

As part of the offer pack that you have received there are supporting documents for you to complete. These can be found via the link in the offer letter and should be completed as soon as possible.

STEP 2: INVITED FOR A GUIDANCE MEETING

In the near future you will be contacted about a guidance meeting to help you and your child select the appropriate options for next year and provide you with the opportunity to meet staff and ask any questions you might have.

STEP 3: CHOOSE OPTIONS

Please read through all of the course information within this booklet. Think about where you want to be in the future and find out what you need to do to achieve your aspirations and aims. Once you have thought through your option choices you will have the opportunity to select your subjects.

STEP 4: INVITED TO THE YEAR 10 INDUCTION DAY

In the summer term future Year 10 students will be invited into the Academy for an induction day. This is an opportunity to become familiar with the Academy, meet staff and other students and prepare for your start in September.

STEP 5: JOINING THE ACADEMY

We look forward to welcoming you in September and hope you enjoy your experience at the WMG Academy.

GCSE ART

Awarding Body: AQA

Course Code: 8202

QAN: 601/8088/2

OVERVIEW OF THE COURSE

Fine Art practice is defined as the need to explore an idea, convey an experience or respond to a theme or issue. The Art Course is designed to develop skills and practice in many areas of Art and Design. Creativity is a door to many exciting career opportunities, building skills such as problem solving, communication as well as developing the student's own visual language. Students will develop a portfolio of work that they can show to prospective employers or use to secure a place in higher education.

CONTENT AND ASSESSMENT

Students will develop a sketch book of work experimenting with a wide range of materials and processes. They will refine their drawing and painting skills and use photography to develop their ideas. Students will look at historical and contemporary Art sources to underpin their knowledge and understanding. All work will be appropriate to students' personal intentions and allow them to take ownership and really explore, in depth, themes that they connect with. These may include, mark-making, collage, assemblage, construction, textiles as well as digital working methods.

Assessment

The course is assessed through two projects over the two years of study.

Component 1) students will respond to a project brief and explore areas of Art and Design in response to this theme. They will realise their intentions by informed research, development and refinement of ideas. Written annotation will support this component.

Component 2) (externally set assignment) Students will respond to a starting point set by the exam board.

This response provides evidence of students' ability to work independently.

Course Content: Assessment objectives.

- AO1: Develop ideas through investigations demonstrating critical understanding of sources.
- AO2: Refine work by exploring ideas, selecting and experimenting with appropriate materials, techniques and processes.
- AO3: Record ideas, observations and insights relevant to intentions as work progresses.
- AO4: Present a personal and meaningful response that realises intentions and demonstrates understanding of visual language.

GCSE BUSINESS

Awarding Body: OCR

Course Code: J204

QAN: 603/0295/1

OVERVIEW OF THE COURSE

GCSE in Business equips students with the skills and confidence to explore how different business situations affect decision-making. They develop their understanding of concepts, objectives and terminology, and the impact of contemporary issues on business operations. The qualification is linear, meaning that students will sit all their exams at the end of the course.

CONTENT AND ASSESSMENT

Paper 1 – 1 hour 30 minutes exam out of 80 marks worth 50% of total GCSE

Business Activity - In this section, learners explore how and why businesses start and grow.

Marketing - In this section, learners explore the purpose and role of marketing within business and how it influences business activity and the decisions businesses take.

People - In this section, learners explore the purpose and role of human resources within business and how it influences business activity and the decisions businesses take.

Paper 2 – 1 hour 30 minutes exam out of 80 marks worth 50% of total GCSE

Operations - In this section, learners explore what business operations involve, their role within the production of goods and the provision of services, and how they influence business activity.

Finance - In this section, learners explore the purpose of the finance function, its role in business and how it influences business activity.

Influences on business - In this section, learners explore the importance of external influences on business and how businesses change in response to these influences.

The interdependent nature of business - In this section, learners will need to use content from both component 01 and component 02 to make connections between different elements of the subject. They will need to draw together knowledge, skills and understanding from different parts of the GCSE course and apply their knowledge to business decision making within a business context.

Both papers consist of a combination of multiple choice, short, medium and extended response style questions. The short, medium and extended response style questions use stimulus material that draws on real business contexts.

GCSE COMPUTER SCIENCE

Awarding Body: OCR

Course Code: J277

QAN: 601/8355/X

OVERVIEW OF THE COURSE

Computer Science is engaging and practical, encouraging creativity and problem solving. It encourages students to develop their understanding and application of the core concepts in computer science. Students also analyse problems in computational terms and devise creative solutions by designing, writing, testing and evaluating programs.

CONTENT AND ASSESSMENT

Paper 1 – 1 hour 30 minutes exam worth 50% of the final grade.

- Systems architecture
- Memory and storage
- Computer networks, connections and protocols
- Network security
- Systems software
- Ethical, legal, cultural and environmental impacts of digital technology

Paper 2 – 1 hour 30 minutes exam worth 50% of the final grade.

- Algorithms
- Programming fundamentals
- Producing robust programs
- Boolean logic
- Programming languages and Integrated Development Environments

GCSE ELECTRONICS

Awarding Body: WJEC

Course Code: 4160 (4161, 4162, 4163)

QAN: 603/0776/6

OVERVIEW OF THE COURSE

Studying this GCSE in Electronics enables learners to develop scientific knowledge and conceptual understanding of the behaviour of analogue and digital electrical/electronic circuits including a wide range of electronic components. Develop an understanding of the nature, processes and methods of electronics as an engineering discipline to help them answer questions about practical circuits and be aware of new and emerging technologies. Develop and learn how to apply observational, practical, problem solving and evaluative skills in the identification of needs in the world around them and to propose and test electronic solutions.

CONTENT AND ASSESSMENT

Discovering Electronics: External Exam – 1 hour 30 minutes, 40% of the GCSE.

1. Electronic systems and sub-systems
2. Circuit concepts
3. Resistive components in circuits
4. Switching circuits
5. Applications of diodes
6. Combinational logic systems

Application of Electronics: External Exam – 1 hour 30 minutes, 40% of the GCSE.

1. Operational amplifiers
2. Timing circuits
3. Sequential systems
4. Interfacing digital to analogue circuits
5. Control circuits

Extended system design and realisation task – Coursework (Non-exam assessment, NEA) 20% of the GCSE.

This component requires each learner to produce a single extended system design and realisation task independently. The task builds on the systems developed throughout the specification and the requirement to relate practical circuit design and construction to knowledge and understanding gained from the examinations. This component requires learners to demonstrate their ability to analyse a problem to enable solutions to be developed by developing a design specification to solve the problem, design and build an electronic system, model its performance against the design specification and modify as appropriate.

GCSE ENGLISH LANGUAGE

Awarding Body: AQA

Course Code: 8700

QAN: 601/4292/3

OVERVIEW OF THE COURSE

English Language is a linear course where students sit all of their exam papers at the end of Year 11. Students are introduced to fiction and non-fiction extracts that they will be asked to explore. One of the non-fiction extracts will be from the 19th century. This qualification will enable students to develop their analytical and creative skills whilst incorporating a variety of genres, audiences, viewpoints and perspectives. This course of study is at the heart of their learning journey and will equip them with a range of reading and writing skills that are valued by employers and colleges alike.

CONTENT AND ASSESSMENT

Paper 1 – Explorations in Creative Reading and Writing.

Written exam: 1 hour 45 minutes, worth 50% of the GCSE.

Section A: Reading - One literature fiction text

Section B: Writing - Descriptive or narrative writing

Paper 2 – Writers' Viewpoints and Perspectives.

Written exam: 1 hour 45 minutes, worth 50% of the GCSE.

Section A: Reading - One non-fiction text and one literary non-fiction text

Section B: Writing - Writing to present a viewpoint

Non Examination Assessment – Spoken Language. (Students will receive a certificate of pass, merit or distinction).

Presenting

Responding to questions and feedback

Use of Standard English

Teacher set throughout course

Marked by teacher

Separate endorsement (0% weighting of GCSE)

GCSE ENGLISH LITERATURE

Awarding Body: AQA

Course Code: 8702

QAN: 601/4447/6

OVERVIEW OF THE COURSE

English Literature is a linear course where students sit all of their exams at the end of Year 11. Students will be introduced to a range of genres over time. It is an academic course of study, which will take students on a journey through the Elizabethan period to modern day poetry. This qualification will enable students to develop a deeper understanding of the written word and will equip them with a range of reading and writing skills that are valued by employers and colleges alike.

CONTENT AND ASSESSMENT

Paper 1 – Shakespeare and the 19th Century Novel

Macbeth (Shakespeare)

Jekyll and Hyde (R. L. Stephenson)

Section A: Shakespeare – Students will answer one question on their play. They will be required to write in detail about an extract from the play and then to write about the play as a whole.

Section B: The 19th-century novel – Students will answer one question on their novel. They will be required to write in detail about an extract from the novel and then to write about the novel as a whole.

Written exam: 1 hour 45 minutes, worth 40% of GCSE.

Paper 2 – Modern Texts and Poetry

An Inspector Calls (J.B Priestley)

Poetry Anthology (Power and Conflict)

Section A: Modern texts – Students will answer one essay question from a choice of two on their studied drama text.

Section B: Poetry – Students will answer one comparative question on one named poem printed on the paper and one other poem from their anthology cluster.

Section C: Unseen poetry – Students will answer one question on one unseen poem and one question comparing this poem with a second unseen poem.

Written exam: 2 hour 15 minutes, worth 60% of GCSE.

GCSE GEOGRAPHY

Awarding Body: OCR (Geography B)

Course Code: J384

QAN: 601/8224/6

OVERVIEW OF THE COURSE

Geography B encourages students to 'think like geographers' by developing an enquiry approach to contemporary topics of study. This qualification integrates fieldwork and geographical skills into the content and assessments giving a holistic approach to the subject. The qualification is linear, and is assessed at the end of the course.

CONTENT AND ASSESSMENT

Paper 1 – 1 hour 15 minute exam worth 35% of the final grade.

- Global hazards
- Changing climate
- Distinctive landscapes
- Sustaining ecosystems
- Fieldwork
- Geographical skills

Paper 2 – 1 hour 15 minute exam worth 35% of the final grade.

- Urban futures
- Dynamic development
- UK in the 21st Century
- Resource reliance
- Fieldwork
- Geographical skills

Paper 3 – 1 hour 30 minute exam worth 30% of the final grade.

- Geographical skills
- Decision making exercise

There is no coursework on this GCSE. However, you will complete fieldwork over the course. At least 15% of the marks in your exams for geography are based on what you learned in your fieldwork.

GCSE HISTORY

Awarding Body: AQA

Course Code: 8145

QAN: 601/8217/9

OVERVIEW OF THE COURSE

In this course students will develop a chronology, knowledge and understanding of history on different scales and contexts, apply historical concepts and processes and engage with the nature of evidence and interpretation. In each pathway, students will engage with a variety of perspectives, such as political, social and economic, and investigate the contributions of key individuals and groups. In this way students will be able to draw parallels and make links between the distinct areas of study. Each element is based around design principles which encourage students, through assessment, to develop the same skills assigned to each element and they will broaden and deepen their historical knowledge.

CONTENT AND ASSESSMENT

Paper 1: Understanding the Modern World – Written exam: 2 hours, worth 50% of the GCSE.

Section A: There is a period study, with a focus on two key developments in a country's history over at last a 50 year period. The period studies are national in their focus, allowing students to study the domestic history of a country and its people in a period of change.

Section B: There is a wider world depth study. This focusses on international conflict and tension. Students will be able to deepen their understanding of the modern world. In each study, the conflict studied requires a focus on a complex historical situation and interplay of different aspects within it.

Paper 2: Shaping the Nation – Written exam: 2 hour, worth 50% of the GCSE.

Section A: There is thematic study, which looks at key developments in Britain over a long period. It gives students a coherent understanding of change and continuity across a long sweep of history and each cover all three specified eras. Although each option has a distinct focus, they all illuminate social, political and economic change and the part played by various factors in shaping the history of Britain.

Section B: There is a British depth study incorporating the study of a specific historic environment. The depth studies are either from the Medieval or Early Modern era. They focus on a particular time and people from that time who shaped the nation. Students will build a coherent understanding of the complexity of society and the interplay of different aspects within it

GCSE MATHEMATICS

Awarding Body: AQA

Course Code: 8300

QAN: 601/4608/4

OVERVIEW OF THE COURSE

In this course you will develop your knowledge and understanding of mathematical methods and concepts. You will use these to make connections and apply the functional elements of mathematics in everyday and real-life situations. You will acquire and use skills such as problem-solving strategies, selecting and applying mathematical techniques and methods, mathematical reasoning, making deductions and inferences, drawing conclusions, as well as interpreting and communicating mathematical information in a variety of forms appropriate to the information and context.

CONTENT AND ASSESSMENT

The course content can be split into six key subject areas:

- Number
- Algebra
- Ratio, Proportion and Rates of Change
- Geometry and Measures
- Probability
- Statistics

Assessment is in the form of externally assessed written exams, taken in the summer of Year 11.

- Three written papers: each contributing 33.3% of the final grade.
- Tiered papers:
 - Foundation: Tier grades 1 - 5 available.
 - Higher: Tier grades 4 - 9 available.
- Each paper lasts 1 hour 30 minutes, with 80 marks on each paper.

GCSE Maths encourages students to develop confidence in, and a positive attitude towards, mathematics and to recognise the importance of mathematics in their own lives and to society. This qualification prepares students to make informed decisions about the use of technology, the management of money, further learning opportunities and career choices.

GCSE SCIENCE (COMBINED)

Awarding Body: AQA

Course Codes: 8464

QAN: 601/8758/X

OVERVIEW OF THE COURSES

Students taking combined science will study to achieve two full GCSEs over their two years of study. They will study a combination of biology, chemistry and physics over two GCSEs. These qualifications are linear. Linear means that students will sit all their exams at the end of the course.

CONTENT AND ASSESSMENT

BIOLOGY	CHEMISTRY	PHYSICS
<ol style="list-style-type: none"> 1. Cell biology 2. Organisation 3. Infection and response 4. Bioenergetics 5. Homeostasis and response 6. Inheritance, variation and evolution 7. Ecology 	<ol style="list-style-type: none"> 8. Atomic structure and the periodic table 9. Bonding, structure, and the properties of matter 10. Quantitative chemistry 11. Chemical changes 12. Energy changes 13. The rate and extent of chemical change 14. Organic chemistry 15. Chemical analysis 16. Chemistry of the atmosphere 17. Using resources 	<ol style="list-style-type: none"> 18. Energy 19. Electricity 20. Particle model of matter 21. Atomic structure 22. Forces 23. Waves 24. Magnetism and electromagnetism

There are six papers: two biology, two chemistry and two physics. Each of the papers will assess knowledge and understanding from distinct topic areas. There is no coursework in science at GCSE. However, for each of the subjects, students are expected to be familiar with 12 required practicals. Questions will be asked about these practicals in examinations.

GCSE SCIENCES (TRIPLE)

Awarding Body: AQA

Course Codes: Biology 8461, Chemistry 8462 and Physics 8463

QAN: 601/8752/9, 601/8757/8, 601/8751/7

OVERVIEW OF THE COURSES

Students taking triple science will achieve three full GCSE grades in biology, chemistry and physics over their two years of study. They will gain further understanding and depth of knowledge compared to students choosing to take combined science, and will be at an advantage for further study. These qualifications are linear. Linear means that students will sit all their exams at the end of the course.

CONTENT AND ASSESSMENT

BIOLOGY	CHEMISTRY	PHYSICS
<ol style="list-style-type: none"> 1. Cell biology 2. Organisation 3. Infection and response 4. Bioenergetics 5. Homeostasis and response 6. Inheritance, variation and evolution 7. Ecology 	<ol style="list-style-type: none"> 1. Atomic structure and the periodic table 2. Bonding, structure, and the properties of matter 3. Quantitative chemistry 4. Chemical changes 5. Energy changes 6. The rate and extent of chemical change 7. Organic chemistry 8. Chemical analysis 9. Chemistry of the atmosphere 10. Using resources 	<ol style="list-style-type: none"> 1. Energy 2. Electricity 3. Particle model of matter 4. Atomic structure 5. Forces 6. Waves 7. Magnetism and electromagnetism 8. Space physics

For each of the science GCSEs students will sit two 1hr 45 minute papers. Each of the papers will assess knowledge and understanding from distinct topic areas. There is no coursework in science at GCSE. However, for each of the subjects, students are expected to be familiar with 12 required practicals. Questions will be asked about these practicals in examinations.

CAMBRIDGE NATIONAL ENGINEERING DESIGN

Awarding Body: OCR

Course Code: J822

QAN: 603/7086/5

OVERVIEW OF THE COURSE

Our Cambridge National in Engineering Design helps students understand the processes of engineering design and how market requirements inform client briefs. Through practical activities they develop skills in computer modelling and model making and how to communicate design ideas effectively.

CONTENT AND ASSESSMENT

External Exam: 1 hour, worth 25% of the final grade

R105: Design briefs, design specifications and user requirements – Students explore the requirements of design briefs and specifications for the development of new products and how consumer requirements and market opportunities inform these briefs. They develop their understanding of the design cycle, the requirements for a design brief and design specification, and the importance of research data in developing a design solution.

Coursework: worth 75% of the final grade consisting of 3 pieces of coursework

R106: Product analysis and research – Students find out how to perform effective product analysis through both research and practical experience of product assembly and disassembly procedures. This helps them develop skills in critical analysis and an understanding and appreciation of manufacturing processes, design features, materials used and the principles behind good design.

R107: Developing and presenting engineering designs – Students develop their knowledge and skills in communicating 2D and 3D design ideas, including effective annotation and labelling. They use detailed hand rendering as well as computer-based presentation techniques and computer-aided design (CAD) software.

R108: 3D design realisation – Students produce a model prototype and test design ideas in a practical context. They evaluate the prototype against the product specification and consider potential improvements to features, function, materials, aesthetics and ergonomics in the final product.

CAMBRIDGE NATIONAL ENGINEERING MANUFACTURE

Awarding Body: OCR

Course Code: J823

QAN: 603/7087/7

OVERVIEW OF THE COURSE

Our Cambridge National in Engineering Manufacture develops students' understanding of the processes involved in transferring a design concept into a product. They apply their knowledge and skills by operating manufacturing equipment following a design specification, using tools such as CAD/CAM.

CONTENT AND ASSESSMENT

External Exam: 1 hour, worth 25% of the final grade

R109: Engineering materials, processes and production – Students develop their understanding of a wide range of engineering materials and how their properties and characteristics impact on a design specification. They also examine different production processes and their applications.

The paper is usually broken up into 3 different areas:

- 1) Materials and properties with their uses.
- 2) Manual methods to form and fabricate highlighting the benefits of the process.
- 3) Modern Technologies such as CNC and Rapid Prototyping - focusing on benefits to quality, workforce and communications.

Coursework: worth 75% of the final grade consisting of 3 pieces of coursework

R110: Preparing and planning for manufacture – Students plan and apply appropriate processes to make pre-production product using hand-held tools, measuring and marking equipment safely. They then carry out a range of manually controlled machining operations and perform quality control checks to review their finished pre-production product

R111: Computer aided manufacturing – Students explore the role of computer applications in the design and manufacture of engineered products by creating computer-aided design (CAD) drawings to produce a batch of computer numerical control (CNC) manufactured examples of a product. They investigate methods used to compare items manufactured by manually controlled and CNC production, and develop their understanding of how computer control is used to produce engineered products in high-volume.

R112: Quality control of engineered products – Students develop their knowledge and understanding of the techniques and procedures used, including 'lean processes' to ensure the quality of engineered products. They produce and implement a detailed set of procedures for the quality control of engineered products in a 'real world' situation involving high-volume manufacture of products.

CAMBRIDGE NATIONAL ICT

Awarding Body: OCR

Course Code: J836

QAN: 603/7115/8

	Marks	Assessment Duration	GLH*	
R050: IT in the digital world	70	1h30	48	Written paper, OCR set and marked
R060: Data manipulation using spreadsheets	60	10 to 12 hours	36	Centre-assessed tasks, OCR moderated
R070: Using augmented reality to present information	60	10 to 12 hours	36	Centre-assessed tasks, OCR moderated

*GLH (guided learning hours) is the approximate time that the teacher will spend supervising or directing study time and assessment activities.

Content overview

R050: IT in the digital world

In this unit, students will learn theoretical knowledge and understanding to apply design tools for applications, principles of human computer interfaces and the use of data and testing in different contexts when creating IT solutions or products.

Students will understand the uses of Internet of Everything and the application of this in everyday life, cyber-security and legislations related to the use of IT systems, and the different types of digital communications software, devices, and distribution channels.

R060: Data manipulation using spreadsheets

In this unit, students will learn the skills to be able to plan and design a spreadsheet solution to meet client requirements. They will be able to use a range of tools and techniques to create a spreadsheet solution based on their design, which they will test. Students will be able to evaluate their solution based on the user requirements.

R070: Using augmented reality to present information

In this unit, students will learn the purpose, use and types of augmented reality (AR) in different contexts and how they are used on different digital devices. They will develop the skills to be able to design and create an AR model prototype, using a range of tools and techniques.

Students will also be able to test and review their AR model prototype.

GCSE FURTHER MATHS (ENRICHMENT)

Awarding Body: AQA

Course Code: 8365

QAN: 603/3104/5

OVERVIEW OF THE COURSE

AQA Level 2 Further Maths GCSE is a unique qualification designed to stretch and challenge high achieving mathematicians who are expected to achieve the top grades in GCSE Mathematics and are likely to progress to study A-level Mathematics and Further Mathematics. It is only offered as an extra-curricular qualification and is studied by invitation only.

High-achieving students are introduced to AS topics that will help them develop skills in algebra, geometry, calculus, matrices, trigonometry, functions and graphs. The course includes topics which will be familiar through their previous studies in mathematics, but also introduces more abstract and unfamiliar topics such as matrices.

CONTENT AND ASSESSMENT

Assessment

The course is assessed through two exams, both of which are 1 hour and 45 minutes.

Paper 1 is non-calculator, and paper 2 is calculator.

Any content from the course can appear on either paper

Content

1. Number

- Combinatorics
- Surds

2. Algebra

- Polynomial Algebra
- Functions
- Simultaneous Equations
- Laws of Indices
- Sequences

3. Coordinate Geometry

- Equation of a straight line
- Equation of a circle

4. Calculus

- Differentiation of polynomials
- Finding gradients of tangents and normal
- Finding higher derivatives
- Finding minima and maxima

5. Geometry

- Geometric Proof
- Trigonometry
- Pythagoras's theorem
- Trigonometric graphs

6 Matrices

- Arithmetic with matrices
- Transformations of the plane