



**HARROW**  
SCHOOL  

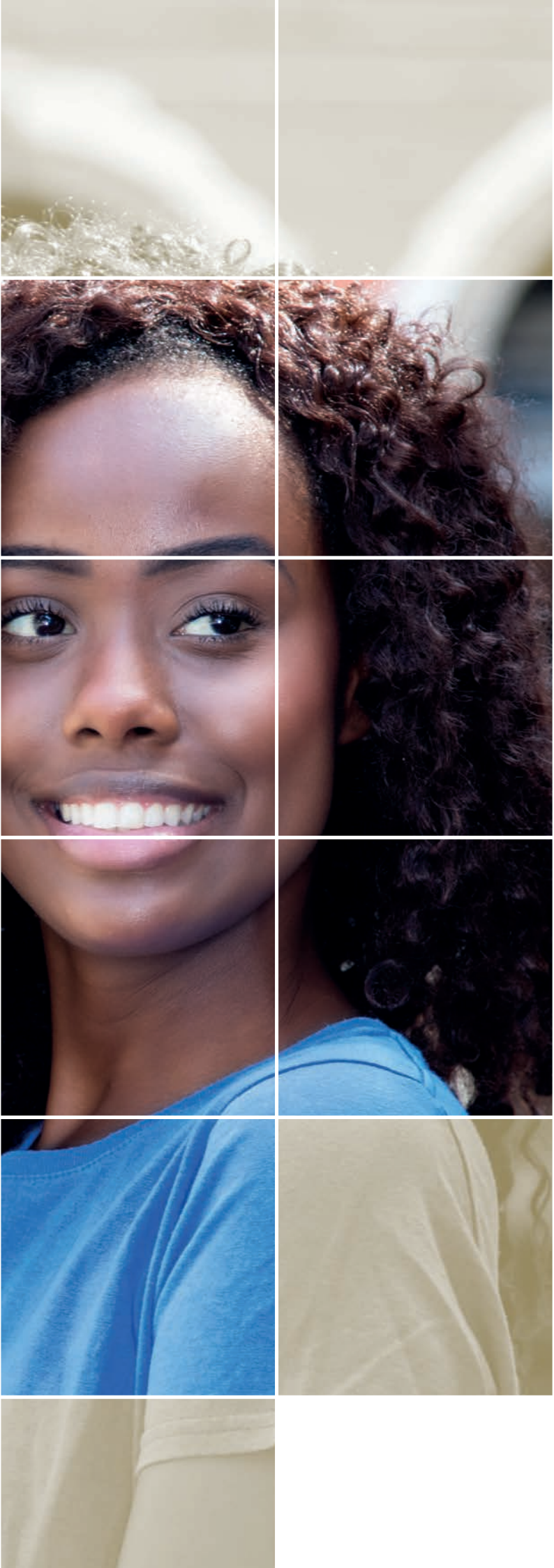
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ONLINE

# **THE CURRICULUM PROGRAMME**

## **2021/22**







## A LEVELS AND OUR CURRICULUM PROGRAMME

The subjects that a pupil chooses to study at A level will have a significant bearing on their university course options and likely future career path. Harrow School Online would always encourage a pupil to select the subjects which they enjoy and in which they believe they are most academically gifted. For pupils who already have quite definite career ambitions, their selection of A Level will need to be carefully considered to ensure that they meet the relevant university course pre-requisites. We highly recommend that pupils discuss their subject choices with the School's Admissions office if they have any questions or concerns.

The rigorous curriculum programme at Harrow School Online has been curated to meet the global interest in and demand from pupils for STEM (Science, Technology, Engineering and Mathematics) subjects and Economics:

- Mathematics
- Further Mathematics
- Economics
- Biology
- Chemistry
- Physics
- Extended Project Qualification ('EPQ').

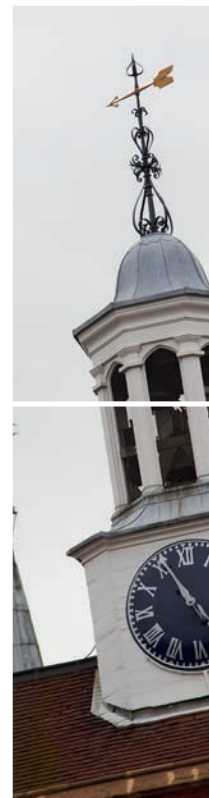
The School exclusively teaches the globally recognised Pearson Edexcel International Advanced Subsidiary (IAS) and International Advanced Level (IAL) Level qualifications which have been specifically designed for pupils seeking to progress to the leading universities in the world. The courses are modular in structure, which means that exams are taken at the end of both the first and second year of study. In some circumstances, a pupil may also sit exams in January or October.



The majority of the School's pupils study three A levels. Particularly able pupils may be accepted to select four, or even five, following considered discussion with the School's Admissions office and successful admissions testing where applicable. The School's educational philosophy is that success is not measured by examination grades alone, but by the influence pupils have, and will have, on the communities in which they live. The School is equally mindful of the pupil's holistic schooling experience and their wellbeing.

Abbreviations used in this document:

- International Advanced Subsidiary – IAS.
- International A2 – IA2 (the additional content required on top of the IAS for an IAL).
- International Advanced Level – IAL.





## **THE SCHOOL'S TEACHING AND LEARNING MODEL**

At Harrow School Online, all pupils follow an individual learning pathway, working through engaging and interactive self-study materials at a pace that suits them and studying in small classes with lessons carefully tailored to their needs and delivered by our expert Teachers. All of the School's courses are designed to provide high levels of academic endeavour, curiosity and achievement. Each pupil is additionally supported by a House Tutor and a Success Coach.

### **THE LEARNING MODEL**

The School's pedagogical approach is based upon the 'flipped learning' model, in which pupils engage with the core learning material on their own during reflective self-study lessons, and then they come together with their teacher to practise and re-enforce their learning.

Each A level requires 5 ¼ hours of learning every week, which is based on seven, forty-five-minute lessons. In addition, each subject has on average three pieces of homework per week. There are two teacher-led live lessons a week in classes capped at fifteen pupils, and five self-study lessons which a pupil completes at a time and pace of their choosing. Every live lesson is recorded in case a pupil misses a class or wishes to review the material again at a later date. The pupils remain in the same class, with the same Teacher, and the same classmates throughout each course.

For pupils studying the combined Mathematics and Further Mathematics programme, pupils are expected to spend at least 7½ hours of learning per week with additional homework. This is comprised of at least 6 hours per week on self-study materials along with two teacher-led lessons.

The rich and engaging self-study lessons are designed to support pupils to access the learning content independently. The materials start with explanations and examples and build up to guided practice with hints and suggestions when pupils make mistakes. They cover the complete syllabus for each subject and include a variety of interactive assessments, which provide the pupil's Teacher with a data-rich insight into their individual level of understanding. This enables the Teacher to appropriately plan the content for their live lessons, and also to quickly step-in and provide individualised targeted stretch or support activities, if necessary.



Pupils studying the Extended Project Qualification (EPQ) complete a course of 25 live lessons across three academic terms and additionally commit to spending 40-80 hours to complete their project. The live lessons on this elective course guide pupils through the skills needed to plan, execute and evaluate their projects, including research skills, project management skills and presentation skills. Pupils are allocated a project mentor and are required to meet regularly with their mentor to track and support progress with their project. Pupils select a project topic which expands their learning in their field of study, in a related area, or an area that is relevant to their own personal interests. Pupils are assessed on their ability to plan, manage, complete and review their project.

### **OFFICE HOURS**

The School's learning model frees time for Teachers to provide individual support when needed. Teachers hold daily 'office hours' during which pupils can arrange an individual meeting to support or extend their understanding of the subject. Teachers may also invite small groups of specific pupils for a targeted micro-lesson during office hours.

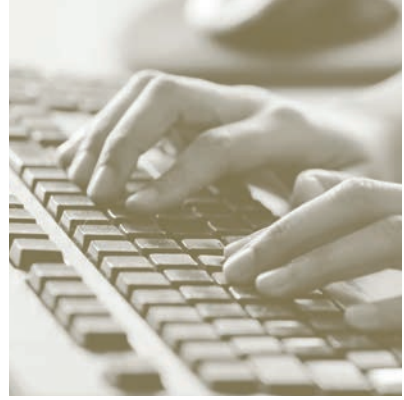
### **HOUSE TUTORS AND SUCCESS COACHES**

Each pupil is assigned to one of the School's Houses during their time at the School. Each House has a House Tutor, all of whom are Teachers who have been allocated an additional role of mentoring a small number of pupils to help them stay on track with their academic studies. House Tutors meet with pupils on an individual basis for thirty minutes once a fortnight and assist them in drawing up a study schedule, organising their time efficiently and managing their workload effectively. They monitor each pupil's academic progress and make early interventions if they are concerned that a pupil is falling behind or not working to their full potential.

Each pupil is also assigned a dedicated Success Coach. Success Coaches meet with every pupil on an individual basis for thirty minutes once a fortnight, helping the pupil thrive in the present and plan for the future. They guide the pupils in developing their academic, personal and social skills, including managing their extra-curricular involvement in the school, and support their university selection and applications, and career planning.

Where there is concern about a pupil's progress, their work is monitored more closely by their House Tutor and Success Coach. They may be invited to have weekly rather than fortnightly meetings with either or both of these individuals until satisfactory improvement is established.





## **THE CURRICULUM**

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### **MATHEMATICS**

#### **Summary**

Although modern Mathematics stands on the shoulders of ancient mathematicians such as Pythagoras, Euclid and Archimedes; today, Mathematics is more relevant than ever. Any modern scientific studies, engineering achievements, economic forecasting, medical research or computing breakthrough has Mathematics at its heart. Mathematics can be studied for fun with logic puzzles, it can exhibit beauty in an elegant solution of an abstract or real-world problem and it shows huge strength of character in its support of so many fields of study.

#### **University and potential careers**

Students of Mathematics frequently progress into degree courses in Mathematics, The Sciences, Computing, Economics, Astronomy and Engineering. An A level in Mathematics is a pre-requisite to many of these courses. Given the high level of numeracy, analysis and reasoning skills that pupils develop, students are highly sought after by employers. A career path for many pupils after university is into banking, financial services, consulting and technology companies.

## **Course structure and examinations**

### **Pure Mathematics units**

P1: Pure Mathematics 1

- Examination: 1 hour and 30 minutes, written.
- Marks: 33.3% of the IAS; 16.6% of the total IAL.

P2: Pure Mathematics 2

- Examination: 1 hour and 30 minutes, written.
- Marks: 33.3% of the IAS; 16.6% of the total IAL.

P3: Pure Mathematics 3

- Examination: 1 hour and 30 minutes, written.
- Marks: Not for IAS; 16.6% of the total IAL.

P4: Pure Mathematics 4

- Examination: 1 hour and 30 minutes, written.
- Marks: Not for IAS; 16.6% of the total IAL.

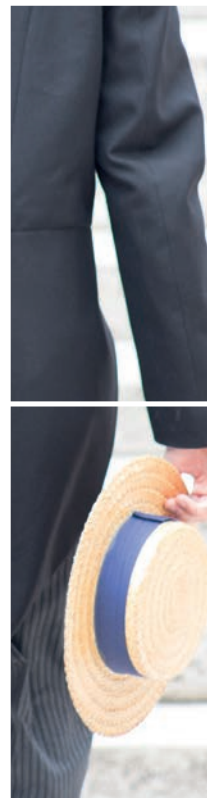
### **Applications units**

M1: Mechanics 1

- Examination: 1 hour and 30 minutes, written.
- Marks: 33.3% of the IAS; 16.6% of the total IAL.

S1: Statistics 1

- Examination: 1 hour and 30 minutes, written.
- Marks: 33.3% of the IAS; 16.6% of the total IAL.





## **FURTHER MATHEMATICS**

### **Summary**

Pupils studying Mathematics may also study Further Mathematics to deepen their mathematical skills. It should be noted that Further Mathematics is considered a challenging A level by many and is only suitable for particularly capable mathematicians. To choose Further Mathematics, you need to really enjoy spending time thinking your way through mathematical problems and be really good at Mathematics.

### **University and potential careers**

Most universities view pupils with a Further Mathematics A level as particularly strong applicants given the hard work that the course requires. It is often used as a key differentiator between mathematics candidates. Many pupils report finding the transition to a STEM degree far more straightforward than their peers who only studies Mathematics. Due to the highly numerate nature of the course, graduates are highly prized by employers. Graduates can be found in almost any career, but particularly in banking and financial services, consulting engineering and technology.

Further Mathematics A-level is particularly beneficial if you are keen to read Mathematics or a strongly mathematical subject (Engineering, Physics, Economics or Computer Science) at a high-ranking university.





### **Course structure and examinations**

In addition to the 6 A level Mathematics modules, Further Mathematics candidates will take a further 6 modules:

#### **Pure Mathematics units**

FP1: Further Pure Mathematics 1

- Examination: 1 hour and 30 minutes, written.
- Marks: 33.3% of the IAS; 16.6% of the total IAL.

FP2: Pure Mathematics 2

- Examination: 1 hour and 30 minutes, written.
- Marks: 33.3% of the IAS; 16.6% of the total IAL.

FP3: Pure Mathematics 3

- Examination: 1 hour and 30 minutes, written.
- Marks: 33.3% of the IAS; 16.6% of the total IAL.

#### **Applications units**

M2: Mechanics 2

- Examination: 1 hour and 30 minutes, written.
- Marks: 33.3% of the IAS; 16.6% of the total IAL.

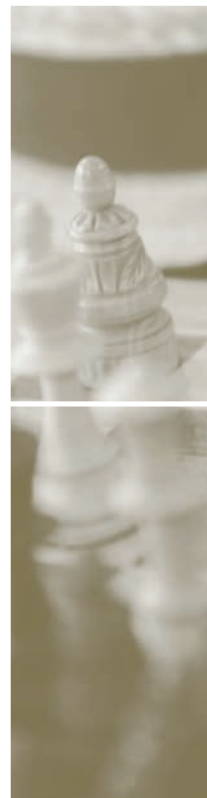
S2: Statistics 2

- Examination: 1 hour and 30 minutes, written.
- Marks: 33.3% of the IAS; 16.6% of the total IAL.

S2: Statistics 2

- Examination: 1 hour and 30 minutes, written.
- Marks: 33.3% of the IAS; 16.6% of the total IAL.

Notice, the applied modules may be used as part of A level Mathematics or Further Mathematics for grading purposes.





## **ECONOMICS**

### **Summary**

Economics is the study of human behaviour and how societies allocate scarce resources. The course examines economic theory and its application in real world scenarios. Pupils learn to analyse and interpret data and graphs to identify trends using economic theory, and to evaluate market forces and the role of individuals and the government. The course will enable pupils to appreciate the contribution of economics to the understanding of the wider economic and social environment. It develops an analytical, enquiring and critical mindset.

### **University and potential careers**

The analytical and problem-solving skills developed in this course are considered critical by many employers today and economics students find the door open to many exciting and fulfilling careers. Many pupils continue their economics study at university and progress into careers in financial services, consulting and government.

N.B. At many leading universities, Mathematics A Level is a course entry requirement to study a degree in Economics.



## **Course structure and examinations**

### **IAS**

Unit 1 – Markets in Action

- Examination: 1 hour and 45 minutes, written.
- Marks: 50% of the IAS; 25% of the total IAL.

Unit 2 – Macroeconomic performance and policy

- Examination: 1 hour and 45 minutes, written.
- Marks: 50% of the IAS; 25% of the total IAL.

### **IA2**

Unit 3 – Business behaviour

- Examination: 2 hours, written.
- Marks: 50% of the IA2; 25% of the total IAL.

Unit 4 – Developments in the global economy

- Examination: 2 hours, written.
- Marks: 50% of the IA2; 25% of the total IAL.







## **BIOLOGY**

### **Summary**

Biology is an important subject due to its integral role in the future of humanity and Earth. Biologists develop cures and vaccines for diseases, treat sick patients and wildlife as doctors, vets and nurses, and lead critical biodiversity conservation work to protect the planet. Many biology pupils will also study A levels in chemistry and mathematics.

### **University and potential careers**

Students of biology often progress into degree courses such as medicine, environmental management, veterinary science and life science e.g. genetics and microbiology. In addition to having successful careers as doctors, scientific researchers, or in wildlife conservation, biology students can be found in many non-scientific careers which require high levels of numeracy and problem-solving skills.





## **Course structure and examinations**

### **IAS**

Unit 1 – Molecules, Diet, Transport and Health

- Examination: 1 hour and 30 minutes, written.
- Marks: 40% of the IAS; 20% of the total IAL.

Unit 2 – Cells, Development, Biodiversity and Conservation

- Examination: 1 hour and 30 minutes, written.
- Marks: 40% of the IAS; 20% of the total IAL.

Unit 3 – Practical Skills in Biology I

- Examination: 1 hour and 20 minutes, written.
- Marks: 20% of the IAS; 10% of the total IAL.

### **IA2**

Unit 4 – Energy, Environment, Microbiology and Immunity

- Examination: 1 hour and 45 minutes, written.
- Marks: 40% of the IA2; 20% of the total IAL.

Unit 5 – Respiration, Internal Environment, Coordination and Gene Technology

- Examination: 1 hour and 45 minutes, written.
- Marks: 40% of the IA2; 20% of the total IAL.

Unit 6 – Practical Skills in Biology II

- Examination: 1 hour and 20 minutes, written.
- Marks: 20% of the IA2; 10% of the total IAL.





## **CHEMISTRY**

### **Summary**

Chemistry is the science that lies at the centre of all sciences. It is the study of the elements and their compounds. Everything we see, touch or taste is made up of chemicals, and the world of technology would not exist but for the materials inside them, many developed and manufactured by chemists. Deep knowledge of chemistry and chemical processes is critical for those students seeking to protect the world from climate change, or to develop vaccines to protect humankind from deadly viruses. Chemistry teaches you key skills for your future career, from data analysis to problem solving.

### **University and potential careers**

Students of chemistry can be found studying almost any science degree at university. The most common degree paths include medicine, veterinary science and the life sciences, with many students also studying the environment, geology and physics. While students of chemistry frequently progress into scientific and medical careers, the data-rich, structured and logical nature of the subject, opens a wide range of career doors including banking and consulting.





## **Course structure and examinations**

### **IAS**

Unit 1 – Structure, Bonding and Introduction to Organic Chemistry

- Examination: 1 hour and 30 minutes, written.
- Marks: 40% of the IAS; 20% of the total IAL.

Unit 2 – Energetics, Group Chemistry, Halogenoalkanes and Alcohols

- Examination: 1 hour and 30 minutes, written.
- Marks: 40% of the IAS; 20% of the total IAL.

Unit 3 – Practical Skills in Chemistry I

- Examination: 1 hour and 20 minutes, written.
- Marks: 20% of the IAS; 10% of the total IAL.

### **IA2**

Unit 4 – Rates, Equilibria and Further Organic Chemistry

- Examination: 1 hour and 45 minutes, written.
- Marks: 40% of the IA2; 20% of the total IAL.

Unit 5 – Transition Metals and Organic Nitrogen Chemistry

- Examination: 1 hour and 45 minutes, written.
- Marks: 40% of the IA2; 20% of the total IAL.

Unit 6 – Practical Skills in Chemistry II

- Examination: 1 hour and 20 minutes, written.
- Marks: 20% of the IA2; 10% of the total IAL.





## PHYSICS

### Summary

Physics is very much the subject of the age. It is key to our understanding of the development of our universe, as well as for the engineering wizardry behind the latest iPhone. It has a reputation for being a challenging subject because of its unique conceptual challenges, but it develops a pupil's numerical and problem-solving skills. This stimulating course is wide-ranging in its coverage and includes Ohm's law, Newton's Laws of Motion, the evolution of stars and nuclear energy.

### University and potential careers

Students of physics progressing to university are frequently found studying degrees in astrophysics, astronomy, engineering, mathematics, medicine and physics. Given the highly quantitative nature of physics, graduates are highly sought after and often progress into rewarding careers in consulting, computing/ IT, engineering and financial services. But there are alternative paths, The Simpsons is written by physics graduates!

N.B. At many leading universities, Further Mathematics A Level is a course entry requirement to study a degree in Physics. And it will certainly increase a pupil's chance of success in a Physics degree.

## Course structure and examinations

### IAS

Unit 1 – Mechanics and Materials

- Examination: 1 hour and 30 minutes, written.
- Marks: 40% of the IAS; 20% of the total IAL.

Unit 2 – Waves and Electricity

- Examination: 1 hour and 30 minutes, written.
- Marks: 40% of the IAS; 20% of the total IAL.

Unit 3 – Practical skills in Physics I

- Examination: 1 hour and 20 minutes, written.
- Marks: 20% of the IAS; 10% of the total IAL.

### IA2

Unit 4 – Further Mechanics, Fields and Particles

- Examination: 1 hour and 45 minutes, written.
- Marks: 40% of the IA2; 20% of the total IAL.

Unit 5 – Thermodynamics, Radiation, Oscillations and Cosmology

- Examination: 1 hour and 45 minutes, written.
- Marks: 40% of the IA2; 20% of the total IAL.

Unit 6 – Practical skills in Physics II

- Examination: 1 hour and 20 minutes, written.
- Marks: 20% of the IA2; 10% of the total IAL.







## **EXTENDED PROJECT QUALIFICATION ('EPQ')**

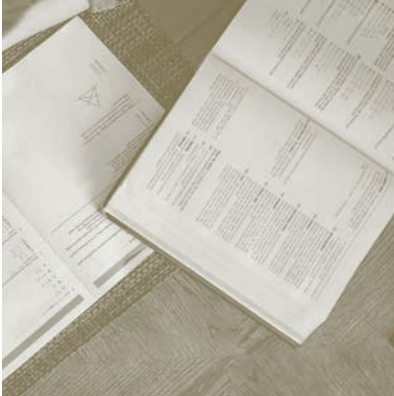
### **Summary**

The Extended Project is a qualification designed to develop learners' critical, reflective, problem-solving and independent learning skills, and supports pupils with the transition to higher education or the world of work. The EPQ is a unique study programme for which the learning material is entirely pupil selected and developed. The pupil selects a topic in which they have a particular interest or passion, which will develop their skills, knowledge and understanding. It could be an in-depth review of a historical issue or the creation of a website. Pupils are assessed on their ability to plan, manage, complete and review their project.

The course is taught across three terms from Spring term of year 12, with projects submitted for moderation in January of year 13.

### **University and potential careers**

Due to the EPQ's intensive requirement for independent learning, critical thinking, evaluation and enquiry, pupils with an Extended Project Qualification are held in high regard by universities and future employers. In some cases, admissions tutors may make a reduced offer to applicants that involves successful completion of the Extended Project. Pupils can draw upon their experience of undertaking the project when writing their personal statement, and a successfully completed Extended Project is often taken into account if a pupil narrowly misses the grades outlined in a university offer to them.



### **Course structure and examinations**

There are four paths in the EPQ, of which a pupil may select only one. Each path, or unit, is equally weighted. Final course grades are assessed by the Teacher responsible for the EPQ at the School.

#### **Unit 1 – Dissertation**

- A theoretical written project on any topic presenting an argument, e.g. research into a biological, historical or environmental issue.

#### **Unit 2 – Investigation/ Field Study**

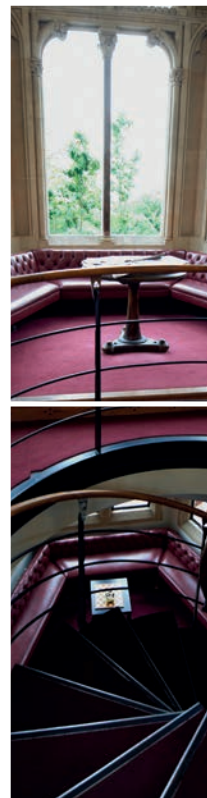
- A practical investigatory project involving the collection of data, e.g. a scientific investigation, a geographical study of erosion, a biological study of pollution, a statistical survey.

#### **Unit 3 – Performance**

- Development of practical skills resulting in a performance, e.g. performing music, drama, sport.

#### **Unit 4 – Artefact**

- For example, making a painting or sculpture, designing a piece of furniture or a garment, creating a website, solving an engineering/construction problem, producing a piece of graphic design.





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