



RUGBY SCHOOL

## **16+ ENTRANCE EXAMINATIONS for entry in September 2024**

**All written examination papers are 1 hour long**

Dictionaries are not permitted in any written papers – except those candidates whose first language is not English; who apply in advance, and qualify for the use of a dictionary under current JCQ rules, may apply to use a non-electronic, bilingual dictionary.

### **Compulsory subjects**

#### **English**

##### **Structure of paper**

- A comprehension passage
- A writing task related to the comprehension passage: there will be a choice of topics.

No prior knowledge is required.

##### **Skills being tested**

The ability to understand texts in terms of interpretation and analysis of linguistic and expressive techniques; the ability to write clear, concise, well-structured and expressive English.

#### **Mathematics**

Recognising that some students will know that their future educational path does not explicitly include maths, the exams will provide for everyone.

The exam will consist of 3 Sections, A, B and C.

Candidates choose one of two routes through the paper, based on their future aspirations.

- **Group 1: Sections A and B should be completed by candidates not intending to study Maths in the Sixth Form, or who intend to study IB Standard Level Maths.** This will cover questions roughly equivalent to GCSE grades 5-8.
- **Group 2: Sections B and C should be completed by candidates intending to study Maths or Further Maths at A level, or IB maths at Higher Level.** This will cover questions roughly equivalent to GCSE grades 6-9 and beyond.

*A Group 1 candidate can choose to sit the Group 2 sections instead if they consider themselves a strong mathematician (anticipating a grade 9 at GCSE).*

The topic list gives details of the requirements for each paper. Note that a topic may appear more than once across the two papers, but is likely to require deeper mathematical insight in Section C than in Section A.

### **Topic List**

#### **Section A (Non-maths A Level and IB SL)**

*The content of the Edexcel IGCSE Foundation exam is assumed throughout.*

##### **Algebra:**

Manipulating expressions – expanding brackets, factorising into single and double brackets, simplifying algebraic sums and products  
Solving equations – linear equations (including involving fractions), quadratic equations  
Indices – rules thereof  
Substituting into expressions  
Plotting linear and non-linear graphs from tables

##### **Number:**

Surds  
Indices  
Order of operations  
Disproof by counterexample (formal proof not expected)  
Fractional arithmetic  
Percentages, fractions, and decimals  
Ratio  
HCF and LCM  
Rounding to DP and SF

##### **Geometry:**

Pythagoras  
Trigonometry in right angled triangles  
Area and perimeter of 2D shapes  
Volume and surface area of 3D shapes

The IGCSE Foundation Specification can be found at this address:

<https://qualifications.pearson.com/content/dam/pdf/International%20GCSE/Mathematics%20A/2016/Specification%20and%20sample%20assessments/International-GCSE-in-Mathematics-Spec-A.pdf>

**Formulae Sheet** (*to be included as part of both exam papers*)

#### **Arithmetic Sequences and Series**

General term,  $U_n = a + (n - 1)d$   
Sum to  $n$  terms,  $S_n = \frac{n}{2}[2a + (n - 1)d]$

#### **Section B (All candidates)**

As above, but additionally:

##### **Algebra:**

Expanding more than two brackets, simultaneous equations, completing the square

##### **Number:**

Rounding and range of values.  
Arithmetic Sequences and Series

##### **Geometry:**

Similar shapes (in 2D and 3D)

Trigonometry all triangles

**Probability of up to three events**  
(including conditional)

#### **Section C (Maths and Further Maths A Level and IB HL)**

As above, but additionally:

##### **Algebra:**

Explaining and reasoning mathematically

##### **Number:**

Problems involving properties of numbers

##### **Geometry:**

Coordinate Geometry

#### **The quadratic equation**

The solutions of  $ax^2 + bx + c = 0$  where  $a \neq 0$  are given by:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

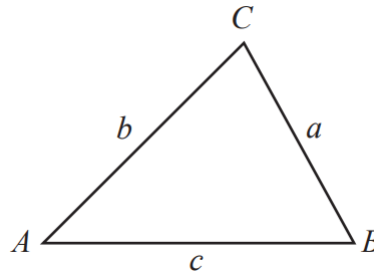
## Trigonometry

In any triangle, ABC,

$$\frac{a}{\sin(A)} = \frac{b}{\sin(B)} = \frac{c}{\sin(C)}$$

$$a^2 = b^2 + c^2 - 2bc\cos(A)$$

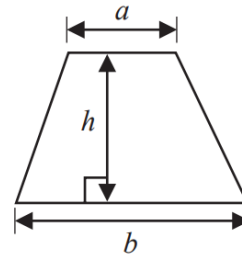
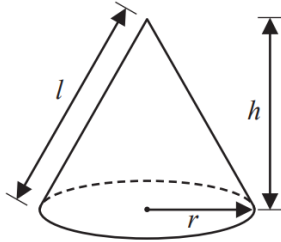
$$\text{Area} = \frac{1}{2}absin(C)$$



Volume of cone =  $\frac{1}{3}\pi r^2 h$

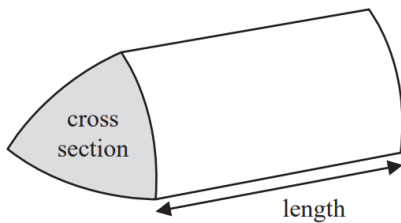
Area of trapezium =  $\frac{1}{2}(a + b)h$

Curved surface area of cone =  $\pi r l$



### Volume of prism

= area of cross section  $\times$  length

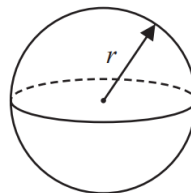
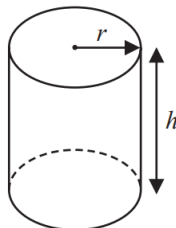


Volume of cylinder =  $\pi r^2 h$

Curved surface area of cylinder =  $2\pi r h$

Volume of sphere =  $\frac{4}{3}\pi r^3$

Surface area of sphere =  $4\pi r^2$



## Additional subject

### Art

- Candidates will be asked to draw directly from observation, working in charcoal from a still life arrangement in the Design Centre Art Studios. The drawing will be on an A1 scale, and will take 1 Hour.
- They will also be expected to bring a portfolio of their work with them to be discussed in an interview with the Head of the Art department.

## Biology

### Structure of Paper

- Multiple Choice 30 marks
- Structured Questions 30 marks

### Required Knowledge

- Standard GCSE Biology syllabus knowledge.
- Covering a variety of areas including molecules, cells, animal physiology, plant physiology, ecology and inheritance

### Skills Being Tested

- Knowledge of biological concepts
- Ability to perform simple calculations using information provided (e.g. percentage change, ratios, rates)
- Analyse data and graphs
- Draw graphs
- Ability to construct a practical set-up
- Ability to critique experimental methodology

## Chemistry

### Structure of the paper

- Multiple choice (30 marks)
- Structured questions (30 marks)

### Required knowledge to answer the paper

- Fundamental GCSE material: atomic structure; elements/compounds/mixtures; word equations; chemical formulae; chemical equation balancing; separation techniques; metallic/ionic/covalent bonding; diamond/graphite/C<sub>60</sub>; alkanes/alkenes; relative formula mass; reaction rates; alkali metals; halogens and noble gases.
- Candidates will be provided with a periodic table. They should be confident using the following concepts: group number; period number; atomic number and mass number.

### Skills being tested

- The ability to recall key facts
- The ability to read and comprehend unfamiliar material
- The ability to apply basic principles to unfamiliar situations
- The ability to analyse data and graphs
- The ability to construct clear and logical answers

## Classical Civilisation

### Structure of paper:

- 3 sections; 15 marks (and recommended 20 minutes) per section.
- Ancient societies: factual recall / analysis and explanation / personal response.
- Ancient literature: factual recall / analysis and explanation / literary analysis.

- Discursive essay: evaluative response based on factual recall and appropriate selection of evidence.

### Required knowledge:

1. Knowledge from any area of the classical world will be credited. Evidence could be taken from GCSE modules including 'Myth and Religion', 'Women in the Ancient World', 'The Homeric World', 'Roman City Life' and 'War and Warfare'. Questions may require candidates to apply their existing knowledge in different ways.
2. Understanding of themes in at least one extended classical text (e.g. Homer's *Odyssey* or Ovid's *Metamorphoses*). Specific plot knowledge will not be required. Reference to any ancient literature may be made and will be credited equally.

### Skills being tested:

- Recall of factual detail.
- Analysis of material and evaluative response to question.

## Computer Science

### Structure of Paper

- Section A – Hardware and Software (25 marks)
- Section B – Programming (25 marks)
- Section C – Implications of Computer Use (5 marks)

### Required Knowledge

- Students are expected to have a strong understanding of the GCSE Computing syllabus although some areas of the assessment will test knowledge beyond this point.
- The written assessment content is taken from the GCSE course sections that relate to programming and coding constructs, data representation, hardware, software, networking, computer architectures and the use and effect of digital technology across society.
- Practical programming skills will also be assessed, and candidates should be able to interpret a real-world problem before analysing, designing and then implementing a solution using a high-level language.

### Skills Being Tested

- Knowledge of fundamental and advanced programming principles.
- Implementation of sub-routines including parameters and arguments.
- Problem solving, analysis and critical thinking.
- An awareness of the impacts of digital technology across different areas of society.
- The quality of written communication.

## Design

### Structure of the paper

- The paper will consist of just one question or design task.
- Part one will ask for a range of concepts to be produced for a given brief.
- Part two will ask for a developed solution of the selected concept or concepts.

- The format will be A3 plain paper.

### **Required knowledge to answer the paper**

- Knowledge of materials and their uses.
- Knowledge of the Design Process.
- Awareness of appropriate construction techniques.

### **Skills being tested**

- Ability to analyse a brief and identify key criteria needed to develop a viable solution.
- Drawing skills – isometric techniques and use of colour.
- Creative ability – production of a range of innovative, feasible solutions.
- Evaluative decision making – ability to show through annotation justification for choices made.

## **Geography**

### **Structure of the paper**

Section A: Compulsory data response question testing general Geographical skills.

Section B: Candidates are required to answer one mini-essay question (1-2 sides), chosen from a variety of titles.

### **Required knowledge to answer the paper**

- No prior subject knowledge is needed for the skills question. A synoptic approach may be adopted bringing in knowledge from several different subjects and experiences.
- GCSE level (any specification) subject knowledge is needed for the mini essays.

### **Skills being tested**

- Ability to use and evaluate visual and numerical resource stimuli.
- Ability to infer conclusions from visual or numerical resource stimuli.
- Ability to write an essay based on the title given and coming to a clear conclusion.

## **History**

### **Structure of the paper**

- 1 source-based question (parts a and b). 10 marks
- 1 essay. 20 marks.

### **Required knowledge to answer the paper**

- no specific knowledge required

### **Skills being tested**

- source comprehension
- the ability to recall, select and deploy historical knowledge
- the ability to construct argument through explanation, analysis and substantiated judgement

## Latin and Greek

### Structure of paper:

- Comprehension and short translation based on a passage of unprepared Latin/Greek, using OCR GCSE vocabulary and grammar
- English to Latin/Greek sentences using OCR GCSE 'restricted vocabulary' list
- Literary Criticism questions on an unseen text, with translation provided

### Required knowledge:

- OCR GCSE Vocabulary and Grammar
- Basic literary appreciation techniques

### Skills being tested:

- Ability to understand an unseen Latin/Greek text
- Ability to form Latin and Greek sentences from English originals
- Literary criticism of an unseen text

## Modern Languages – French/German/Spanish

### Structure of paper

The language papers in French, German and Spanish include:

- Comprehension exercises
- Grammar exercises
- An essay in the target language

### Required prior knowledge:

Students will normally be expected to answer reading comprehension questions in the target language and in English on a variety of GCSE themes. We expect students to show awareness of GCSE grammar and the ability to manipulate it. The essay will focus on one of the current GCSE themes. We are aware that candidates have been studying languages for different amounts of time and so we look for potential. Our ideal candidate is one that has very secure and accurate knowledge of what they have covered so far.

### Skills being tested:

- Reading comprehension - the ability to read for detail and for gist.
- Grammatical knowledge – students are advised to consult the list of grammar requirements for GCSE in their chosen language.
- Writing - the ability to write a detailed, focused and accurate essay in the target language containing a wide range of simple and complex structures, and a wide range of vocabulary appropriate to the task.

If a candidate is invited to be considered for a scholarship, there will be an interview conducted in the target language, covering GCSE-style general conversation questions. We are looking for the ability to extend answers, a good accent and the ability to move away from what may have been pre-learnt or prepared.

## Music

### Structure of the paper:

- Performance on main instrument; 10mins
- Aural tests; 10 mins
- Listening Skills; 20 mins
- Essay; 20 mins

### Required knowledge to answer the paper:

- Knowledge to roughly ABRSM Grade V music theory level
- Performing ability of ABRSM Grade V or above
- Experience of GCSE level listening skills

### Skills being tested:

- Performing ability; demonstrating secure technical control through a musical, convincing and assured performance
- Aural skills; recognition of cadences, notating a melody from listening, aural identification of intervals, etc
- Listening skills; recognising instruments, time signatures, textures, rhythms, composition devices, etc
- Essay; writing style and ability to organise and structure extended prose

## Physics

### Structure of Paper:

- Multiple Choice 20 marks
- Structured Short Written Answers 40 marks

### Required Knowledge:

- Standard GCSE formulae and units need to be learnt (and will not be provided)
- Knowledge and Understanding of Electricity, Waves, Forces and Motion and Energy at GCSE level

### Skills Being Tested:

- Knowledge of key physics facts
- Understanding of physics principles and ability to apply them
- Ability to perform calculations using information provided
- Ability to construct logical, structured written explanations

## Physical Education

### Structure of Paper

Three sections are examined:

- Applied Anatomy and Physiology
- Health, Fitness & Well Being
- Socio-cultural Issues & Sports Psychology



Each section is broken down into multiple choice and short structured questions, with 20 marks available for each section.

### Required Knowledge

Standard GCSE Physical Education syllabus knowledge.

The paper covers a variety of areas on anatomy and physiology, health, fitness, well being, socio-cultural issues and sports psychology.

These areas can be further broken down into the following topics: The skeletal, muscular, cardiovascular and respiratory systems. The effects of exercise on the body, principles of training, components of fitness, types of training, injury prevention, nutrition, health and well-being. Performance enhancing drugs, factors affecting participation in sport, media, sponsorship, skill, motivation, mental preparation and SMART goal setting.

### Skills Being Tested

Application of theoretical knowledge to practical activities.

Ability to demonstrate a topical and relevant knowledge of current issues in sport and physical education.'

## Religious Studies (Philosophy & Theology)

### Structure of paper:

- A 2, 4, 6, 8 and 12 mark question
- One of each question will be on the paper
- These questions will ask about religious belief. The candidate may refer to philosophical or ethical ideas where relevant.

### Required knowledge:

- GCSE-level knowledge of religion (the most commonly studied areas at GCSE level). Philosophy and Ethics can be referred to throughout the paper where the candidate sees fit.

### Skills being tested:

- Knowledge of religious beliefs and teachings. Knowledge of philosophy and ethics can be used where the candidate feels appropriate.
- Understanding of differences in religious belief and practice and how this may influence an individual.
- The ability to form a coherent and persuasive argument using analysis and evaluation, using precise technical terminology.

## Theatre Studies

### Structure of paper

A one hour paper

Two questions will be set:

- Practical work that you have been involved in: an essay that will ask candidates to reflect on their strengths and relative weaknesses as a *performer* or *designer* in one previous production, or extract from a play, in which they have been involved.  
(30 minutes)

- Live Theatre Evaluation: an essay that will ask them to analyse a professional theatre production. This can be from a digital platform, such as Digital Theatre+

In their answer candidates should describe **key moments** from at least one actor's performance, but they can also make reference to any, or all, of the following production elements: set; lighting; sound; special effects; costume and/or make-up.

(30 minutes)

#### **Required knowledge:**

- GCSE-level knowledge of subject specific terminology.
- A live theatre performance experience that can be recalled in detail.

#### **Skills being tested**

- The ability to apply subject specific language accurately and purposefully
- The ability to evaluate and analyse personal performance/design skills
- Analysis of production elements
- The ability to write clearly and concisely in a well-structured and expressive manner