

Subject:

# MATHEMATICS

## [Secure pathway]

Mathematics Intent:

The Maths department aims to challenge and inspire students to build logical, independent thinking skills, enabling a strong mathematical foundation to develop for every student, supporting success throughout the curriculum and throughout life.

Our Exam Board is: OCR

### The Big Questions...

#### Year 10

##### September-December:

- How are measurements converted and interpreted while applying the appropriate degree of accuracy? How do speed, distance and time interact with each other? What are irrational numbers and why would you use them? Which is the most appropriate average in certain situations and why? What angle facts can be derived from polygons, especially a right-angled triangle?

##### January-April:

- How do you apply the rules of Algebra to manipulate and solve quadratic and cubic equations? What information can you derive from a graph? How can formulae be utilised to calculate missing values? How do you find the values of two variables given two different scenarios? How much material is needed to construct a 3D shape? How are the area/volume of composite shapes calculated? How likely is a specific set of events to happen in a certain environment?

##### May-July:

- What part do graphs play in interpreting and converting two sets of data? How do you calculate lengths and angles in 3D? What are composite functions and how are they interpreted? What real world scenarios can be modelled as exponential growth and decay?

#### Year 11

##### September-December:

- How do you recognise the key facts about a circle from its equation? How many different ways are there to solve a quadratic equation? What is the constant of proportionality and when is it relevant? How does direct proportion differ from inverse proportion? What makes a vector different from a linear graph? What do trigonometric graphs represent and how can they be transformed? Can you find the lengths of sides and angles in any triangle?

##### January-April:

- How do you move and stretch functions using transformations? How do you find a specific number given the  $n^{\text{th}}$  term of a quadratic sequence? What are the circle theorems and why are they useful? How do you calculate the rate of change given two variables?  
The remainder of this term will focus on topics highlighted, for each specific year 11 class, during the first Maths Mock exam (December) and prepare students for their second mock (March).

##### May-July:

- This term will focus on topics highlighted, for each specific Year 11 class, during the second Maths Mock exam.

#### What skills will I develop?

In addition to the key Mathematical knowledge that students will master, a sound understanding of Mathematics will also develop logical thinking skills that enable the solving of the more complex problems that life throws at us. Mathematics underpins much of the world around us and forms the basis of the knowledge needed to be successful both in education and beyond. Students are coached on techniques to break a problem into smaller more manageable parts and encouraged to transfer the skill they have learnt in the Maths class to other areas of the curriculum.

#### What great resources can I use?

- <https://vle.mathswatch.co.uk/vle/> contains teaching videos for every Maths topic with interactive (method and exam) questions. Clip numbers are often provided on revision materials. Marked on-line for instant feedback. (Used for Year 11 homework)
- <https://www.mymaths.co.uk/> - on-line lessons on every Maths topic with linked practice questions. Marked on-line so students get instant feedback. (Often used for Year 10 homework)
- <https://www.mathsgenie.co.uk/gcse.html> - selection of past GCSE questions sorted by Maths topic, with worked answers - excellent for final exam preparation.
- <https://www.ocr.org.uk/qualifications/gcse/mathematics-j560-from-2015/> - exam board website with the full Mathematics GCSE specification.

#### How will I be assessed?

Each week homework will be set, with details on SMHW. Knowledge of a topic will be assessed using the results of this work. At the end of some topics there will be a Topic Assessment. Students will know in advance and will be expected to prepare well. The assessments are open book and students may use their classwork or revision notes in these tests. End of year exams will take place in Year 10, where they will sit a full GCSE paper and be graded using the OCR grade boundaries.

**Examination:** The end of the GCSE course is 100% exam-based and will involve three GCSE papers, taken at the end of Year 11. All papers are 1hr 30mins long.

#### Three ways that parents/carers can help...

1. Ensure your child has all the Maths equipment that may be needed at all times. At any point a calculator, ruler, compass, protractor, pencil or rubber could be required in a Maths lessons.
2. Encourage your child to approach their Maths homework as an opportunity to ensure they have a good understanding of that specific topic, rather than a task to tick to say it is done. (Year 11 homework is designed to revise all the key GCSE topics across the year.)
3. Students are encouraged to select areas for improvement following every assessment/Skill-up. Ask your child what topics they have chosen and let them describe what they have done to ensure their understanding has improved. This should involve 'doing' some Maths. Maths revision works best in small chunks of 15-20 minutes each evening and should involve 'doing' rather than 'reading'.