



# MATHEMATICS DEPARTMENT

Curriculum Overview



The curriculum at West Derby School reflects the aspirations we have for all students. It is designed to be as ambitious as the National Curriculum, offering a first-class education that is rich in knowledge and skills, whilst also being broad and balanced throughout the key stages. In Mathematics we deliver a mastery scheme of work to develop confident mathematicians who are problem solvers, capable of taking their knowledge from school into real life situations.

## Departmental Overview

The Mathematics Department is comprised of thirteen teachers and is located over two floors of the Derby Building. Each classroom has an interactive whiteboard and the department has access to two class sets of laptops and two class sets of iPads. This technology provides support for the pupils with their classwork and enables them to learn independently. Using these, pupils can make use of the apps and online support provided for them by the department.

SEND pupils are considered at every stage of planning and delivery of the curriculum. Our strategies are consistent across all classes and we regularly meet as a department to share what is working well with our SEND pupils. We often find that a predictable routine, and small, manageable chunks of learning support many pupils in their learning. We have additional support in lessons for SEND pupils and aim to keep class sizes as small as possible where we can. In addition to whole school strategies, we are keen to make Maths not only accessible, but also enjoyable for all pupils. With this in mind, we strive to create rich learning activities in a style that pupils become accustomed to quickly, allowing them to know for themselves how they are progressing and ask increasingly specific questions as their confidence grows.

## Departmental Staff

Mr H Handhill	Director of Mathematics
Mr M Donga	Director of Mathematics
Mr C Smith	Deputy Head Mathematics
Mrs E Rice	Deputy Head Mathematics
Mrs G Gavin	Assistant Head Mathematics
Miss M Haslam	Assistant Head Mathematics
Mr T Keating	Mathematics Teacher
Mr S Donohue	Mathematics Teacher, Head of Sixth Form
Mrs T Swain	Mathematics Teacher, Assistant Headteacher
Mrs S Wilkinson	Mathematics Teacher, Deputy Headteacher and SLT Line Manager

# Year 7 Mathematics (KS3)

## Curriculum Overview

### Brief Overview

<u>Term 1</u>	<u>Term 2</u>	<u>Term 3</u>
<ul style="list-style-type: none"> <li>➤ The Number System</li> <li>➤ Operating with Number</li> <li>➤ Fractions &amp; Percentages</li> </ul>	<ul style="list-style-type: none"> <li>➤ Ratio &amp; Proportion</li> <li>➤ Expressions, Functions and Formula</li> <li>➤ Analysing &amp; Displaying Data</li> <li>➤ Probability</li> </ul>	<ul style="list-style-type: none"> <li>➤ Lines and Angles</li> <li>➤ Sequences and graphs</li> <li>➤ Transformations</li> </ul>

In Year 7 pupils follow objectives from the National Curriculum. Pupils are encouraged to build on their knowledge from Key Stage 2, developing their mathematical thinking and preparing them for the GCSE examinations. Pupils are taught to justify their methods and explain their reasoning ensuring they become resilient and independent problem solvers. All classes will follow the same topics however more support is given to lower ability and more depth is applied to the higher ability.

### New Knowledge (What we would like students to know and understand by the end of year 7)

Throughout year 7, pupils will be given the opportunity to consolidate their learning from KS2 as well as being introduced to new aspects of Mathematics such as more complex algebra and graphs. Pupils will learn new skills such as algebraic manipulation and how to use Mathematical equipment.

### Disciplinary Vocabulary

<https://app.weduc.co.uk/get/external/p/id/7d72b30235a6c9d455f0a0574889975103a98112997c484c783eb30565ba32a8.xlsx>

### Prior Learning and Recall

<u>Term 1</u>	<u>Term 2</u>	<u>Term 3</u>
<ul style="list-style-type: none"> <li>➤ Number bonds</li> <li>➤ Written and mental methods using the four operations</li> <li>➤ Place value</li> <li>➤ Fractions and proportion</li> </ul>	<ul style="list-style-type: none"> <li>➤ Understanding what the Mean, Median and Mode are.</li> <li>➤ Ordering positive and negative numbers including decimals and fractions.</li> <li>➤ Basic rules of number</li> </ul>	<ul style="list-style-type: none"> <li>➤ Properties of shapes</li> <li>➤ Expressions, Functions &amp; Formulae</li> </ul>

### Examinations/Key Assessments

Following a baseline assessment at the start of the year, regular assessment takes place during lessons and a more formal assessment is given once each term to track a pupil's progress. Classwork will be marked in detail by the class teacher, informing pupils of how they are doing, highlighting areas of weakness and strength. Pupils are also taught to mark their own work and the work of their peers. This allows pupils to understand how their work is assessed and how it can be improved.

### Homework (Including Links)

This is set once a week and is designed to support the work done during lessons. The work will be set on Sparx maths which is programmed by an AI system designed to bespoke the tasks to suit the needs of each individual student. There are video available for the students to watch on questions that they are struggling with. All pupils will be given A5 homework books. These should be use to help them complete working out that will be require for their homework. They should also be use to write down questions and answers in order to help them with the Sparx bookmark questions. As well as using Sparx to complete compulsory homework, students can also complete independent tasks that will gain them XP points and prizes. We encourage that all pupils should strive to not only complete their homework, but also complete as many independent tasks as they can.

Homework is set every Wednesday at 9am and is due in on the following Wednesday at 11pm. Homework support clubs are available at lunchtimes on Tuesday and Thursday in D22.

As it is school policy to set homework, a detention will be issued. Parents will receive an email every Sunday to notify them of any incomplete homework.

Prior to assessment periods, pupils may receive an increased volume of homework or independent study work. This will help them to prepare for exam revision in the future.

## How Parents can Help

- Other useful website to use:
  - MyMaths - <https://www.mymaths.co.uk/>
  - Sparx Maths - <https://sparxmaths.com/>
  - Oak Academy - <https://www.thenational.academy/>
  - Corbett Maths - <https://corbettmaths.com/>
  - Maths Genie - <https://www.mathsgenie.co.uk/>
  - Just Maths (more tailored towards GCSE) - <https://justmaths.co.uk/>
- Check *Satchel One* regularly and ensure all work is completed to a good standard.
- Ensure that basic equipment is brought to each lesson. A pen, pencil and ruler are the minimum requirements.
- Encourage the use of the Internet for homework completion and revision (see useful websites list).
- Talk about the Mathematics that your child is studying and in the world around them. Encourage the use of the correct terms and language (see parent booklet on school website).
- Ensure pupils revise for assessment tests.

# Year 8 Mathematics (KS3)

## Curriculum Overview

### Brief Overview

<u>Term 1</u>	<u>Term 2</u>	<u>Term 3</u>
<ul style="list-style-type: none"> <li>➤ Number</li> <li>➤ Decimals and Ratio</li> <li>➤ Calculating with Fractions</li> </ul>	<ul style="list-style-type: none"> <li>➤ Percentages, Decimals and Fractions</li> <li>➤ Area and Volume</li> <li>➤ Expressions and Equations</li> <li>➤ Straight-line Graphs</li> </ul>	<ul style="list-style-type: none"> <li>➤ Lines and Angles</li> <li>➤ Statistics, Graphs and Charts</li> <li>➤ Real-life Graphs</li> </ul>

In Year 8 pupils follow objectives from the new National Curriculum. Pupils are encouraged to build on their knowledge from Key Stage 2 and year 7, developing their mathematical thinking and preparing them for the GCSE examinations. Pupils are taught to justify their methods and explain their reasoning ensuring they become resilient and independent problem solvers. All classes will follow the same topics however more support is given to lower ability and more depth is applied to the higher ability.

### New Knowledge (What we would like students to know and understand by the end of year 8)

Mathematics follows a spiral learning scheme so pupils may revisit some topics from previous years however there will be more of an emphasis on depth within the topic. Pupils should take their knowledge from previous years and build on it in order to improve. During year 8 there is more of a focus on graphs, in particular real life graphs and straight line graphs.

### Disciplinary Vocabulary

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### Prior Learning and Recall

<u>Term 1</u>	<u>Term 2</u>	<u>Term 3</u>
<ul style="list-style-type: none"> <li>➤ Fractions and proportion</li> <li>➤ Written and mental methods using the four operations</li> <li>➤ Operations with powers of 10</li> <li>➤ Place value</li> </ul>	<ul style="list-style-type: none"> <li>➤ Operating between fractions and percentages</li> <li>➤ Properties of shapes</li> <li>➤ Sequences and graphs</li> <li>➤ Expressions, Functions and Formula</li> </ul>	<ul style="list-style-type: none"> <li>➤ Angle facts</li> <li>➤ Calculating and understanding averages</li> <li>➤ Sequences and graphs</li> <li>➤ Expressions, Functions and Formula</li> </ul>

### Examinations/Key Assessments

Regular assessment takes place during lessons and a more formal assessment will be given once each term to track a pupil's progress throughout the year. Classwork will be marked in detail by the class teacher, informing pupils of how they are doing, highlighting areas of weakness and strength. Pupils are also taught to mark their own work and the work of their peers. This allows pupils to understand how their work is assessed and how it can be improved.

### Homework (Including Links)

This is set once a week and is designed to support the work done during lessons. The work will be set on Sparx maths which is programmed by an AI system designed to bespoke the tasks to suit the needs of each individual student. There are video available for the students to watch on questions that they are struggling with. All pupils will be given A5 homework books. These should be use to help them complete working out that will be require for their homework. They should also be use to write down questions and answers in order to help them with the Sparx bookmark questions. As well as using Sparx to complete compulsory homework, students can also complete independent tasks that will gain them XP points and prizes. We encourage that all pupils should strive to not only complete their homework, but also complete as many independent tasks as they can.

Homework is set every Wednesday at 9am and is due in on the following Wednesday at 11pm. Homework support clubs are available at lunchtimes on Tuesday and Thursday in D22.

As it is school policy to set homework, a detention will be issued. Parents will receive an email every Sunday to notify them of any incomplete homework.

Prior to assessment periods, pupils may receive an increased volume of homework or independent study work. This will help them to prepare for exam revision in the future.

## How Parents can Help

- Other useful website to use:
  - MyMaths - <https://www.mymaths.co.uk/>
  - Sparx Maths - <https://sparxmaths.com/>
  - Oak Academy - <https://www.thenational.academy/>
  - Corbett Maths - <https://corbettmaths.com/>
  - Maths Genie - <https://www.mathsgenie.co.uk/>
  - Just Maths (more tailored towards GCSE) - <https://justmaths.co.uk/>
- Check *Satchel One* regularly and ensure all work is completed to a good standard.
- Ensure that basic equipment is brought to each lesson. A pen, pencil and ruler are the minimum requirements.
- Encourage the use of the Internet for homework completion and revision (see useful websites list).
- Talk about the Mathematics that your child is studying and in the world around them. Encourage the use of the correct terms and language (see parent booklet on school website).
- Ensure pupils revise for assessment tests.

# Year 9 Mathematics (KS3)

## Curriculum Overview

### Brief Overview

<u>Term 1</u>	<u>Term 2</u>	<u>Term 3</u>
<ul style="list-style-type: none"> <li>➤ Indices and Standard Form</li> <li>➤ Expressions and Formulae</li> <li>➤ Dealing with Data</li> <li>➤ Multiplicative Reasoning</li> </ul>	<ul style="list-style-type: none"> <li>➤ Sequences, Inequalities, Equations and Proportion</li> <li>➤ Circles, Pythagoras and Prisms</li> <li>➤ Graphs</li> </ul>	<ul style="list-style-type: none"> <li>➤ Probability</li> <li>➤ Comparing Shapes</li> <li>➤ Constructions</li> </ul>

In Year 8 pupils follow objectives from the new National Curriculum. Pupils are encouraged to build on their knowledge from Key Stage 2 and year 7, developing their mathematical thinking and preparing them for the GCSE examinations. Pupils are taught to justify their methods and explain their reasoning ensuring they become resilient and independent problem solvers. In Year 8 pupils follow objectives from the new National Curriculum. Pupils are encouraged to build on their knowledge from Key Stage 2 and year 7/8, developing their mathematical thinking and preparing them for the GCSE examinations. Pupils are taught to justify their methods and explain their reasoning ensuring they become resilient and independent problem solvers. In Year 8 pupils follow objectives from the new National Curriculum. Pupils are encouraged to build on their knowledge from Key Stage 2 and year 7, developing their mathematical thinking and preparing them for the GCSE examinations. Pupils are taught to justify their methods and explain their reasoning ensuring they become resilient and independent problem solvers. All classes will follow the same topics however more support is given to lower ability and more depth is applied to the higher ability.

### New Knowledge (What we would like students to know and understand by the end of year 9)

Mathematics follows a spiral learning scheme so pupils may revisit some topics from previous years however there will be more of an emphasis on depth within the topic. Pupils should take their knowledge from previous years and build on it in order to improve. During year 9 there are a number of new topics which the pupils will face, particularly to do with shapes. Pupils will be introduced to calculating area and volume of 3D shapes along with seeing new topics such as Pythagoras theorem and standard form.

### Disciplinary Vocabulary

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### Prior Learning and Recall

<u>Term 1</u>	<u>Term 2</u>	<u>Term 3</u>
<ul style="list-style-type: none"> <li>➤ Order of operations</li> <li>➤ Ratio and proportion</li> <li>➤ Calculating and understanding averages</li> </ul>	<ul style="list-style-type: none"> <li>➤ Substitution</li> <li>➤ Using mathematical equipment such as a protractor and a compass</li> <li>➤ Area and perimeter of 2D shapes</li> <li>➤ Algebraic manipulation i.e. simplifying expressions</li> </ul>	<ul style="list-style-type: none"> <li>➤ Scales and measure</li> <li>➤ Ratio and proportion</li> <li>➤ Area and Volume of 2D and 3D shapes</li> <li>➤ Angle facts</li> </ul>

### Examinations/Key Assessments

Regular assessment takes place during lessons and a more formal assessment will be given once each term to track a pupil's progress throughout the year. Classwork will be marked in detail by the class teacher, informing pupils of how they are doing, highlighting areas of weakness and strength. Pupils are also taught to mark their own work and the work of their peers. This allows pupils to understand how their work is assessed and how it can be improved.

### Homework (Including Links)

This is set once a week and is designed to support the work done during lessons. The work will be set on Sparx maths which is programmed by an AI system designed to bespoke the tasks to suit the needs of each individual student. There are video available for the students to watch on questions that they are struggling with. All pupils will be given A5 homework books. These should be use to help them complete working out that will be require for their homework. They should also be use to write down questions and answers in order to help them with the Sparx bookmark questions. As well as using Sparx to complete compulsory homework, students can also complete independent tasks that will gain them XP points and prizes. We encourage that all pupils should strive to not only complete their homework, but also complete as many independent tasks as they can.

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#### How Parents can Help

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  - Maths Genie - <https://www.mathsgenie.co.uk/>
  - Just Maths (more tailored towards GCSE) - <https://justmaths.co.uk/>
- Check *Satchel One* regularly and ensure all work is completed to a good standard.
- Ensure that basic equipment is brought to each lesson. A pen, pencil and ruler are the minimum requirements.
- Encourage the use of the Internet for homework completion and revision (see useful websites list).
- Talk about the Mathematics that your child is studying and in the world around them. Encourage the use of the correct terms and language (see parent booklet on school website).
- Ensure pupils revise for assessment tests.



# Year 10 Mathematics (KS4)

## Curriculum Overview

### Brief Overview

<u>Higher</u>	<u>Foundation</u>
<b>Term 1</b> <ul style="list-style-type: none"> <li>➤ Number: Powers, Roots, Indices and Surds</li> <li>➤ Expressions, Formulae and Proof</li> <li>➤ Data: Averages and Range</li> </ul>	<b>Term 1</b> <ul style="list-style-type: none"> <li>➤ Number: Powers and Decimals, HCF and LCM, Roots and Rounding</li> <li>➤ Algebra: Expressions, Expanding and Factorising</li> <li>➤ Drawing and Interpreting Graphs, Tables and Charts</li> </ul>
<b>Term 2</b> <ul style="list-style-type: none"> <li>➤ Data: Averages and Range</li> <li>➤ Fractions, Percentages &amp; Ratio</li> <li>➤ Angles, polygons, Pythagoras and Trigonometry</li> </ul>	<b>Term 2</b> <ul style="list-style-type: none"> <li>➤ Fractions and Percentages</li> <li>➤ Algebra: Equations, Inequalities and Sequences</li> <li>➤ Angles, Polygons and Parallel Lines</li> </ul>
<b>Term 3</b> <ul style="list-style-type: none"> <li>➤ Graphs: Real-life, Algebraic, Circles and Rates of Change</li> <li>➤ Perimeter, Area and Volume,</li> <li>➤ Transformations, Constructions, Plans and Elevations and Bearings</li> <li>➤ Algebra: Quadratics, Inequalities, Simultaneous Equations</li> </ul>	<b>Term 3</b> <ul style="list-style-type: none"> <li>➤ Statistics: Sampling and Averages</li> <li>➤ Perimeter, Area and Volume</li> <li>➤ Graphs</li> </ul>

There is now a greater emphasis on problem-solving skills, which will require a level of skill in each of these areas and will test your ability to apply these skills in a variety of situations. Work in lessons can be individual, paired, group work or whole-class discussion. You may be completing an exercise to practise a skill, or discussing a new concept to address misconceptions and alternative methods. To do this, you will be taught how and when to use appropriate mathematical software and calculators. You will learn written methods and formulae required to solve problems, given exam practice questions and shown how to work independently and revise for your exams.

### New Knowledge (What we would like students to know and understand by the end of their GCSE)

Throughout the GCSE curriculum there is an emphasis on exam practice, understanding how to structure an answer, problem solving and time keeping. Along with learning the content, pupils will build resilience and independence which are key skills for them to carry forward into the next part of their education.

### Disciplinary Vocabulary

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### Prior Learning and Recall

<u>Higher</u>	<u>Foundation</u>
<ul style="list-style-type: none"> <li>➤ Factors, multiples and primes</li> <li>➤ Converting between fractions, decimals and percentages</li> <li>➤ Algebraic manipulation including simplifying expressions, solving multi step equations, expanding brackets and factorising.</li> <li>➤ Using mathematical equipment such as a protractor and compass</li> <li>➤ Properties of 2D and 3D shapes</li> <li>➤ Area and volume of 2D and 3D shapes</li> <li>➤ Angle facts</li> <li>➤ Proportion</li> <li>➤ Constructing graphs</li> <li>➤ Calculating averages</li> <li>➤ Recognising a sequence both numerically and graphically.</li> <li>➤ Calculating using the four operations, including with fractions and decimals.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Number bonds</li> <li>➤ Place value</li> <li>➤ Operating with powers of 10</li> <li>➤ Calculating using the four operations, including with fractions and decimals</li> <li>➤ Using mathematical equipment such as a protractor and compass</li> <li>➤ Recognising a sequence both numerically and graphically.</li> <li>➤ Recall the formulae for area of 2D shapes</li> <li>➤ Calculating averages</li> <li>➤ Angles facts</li> </ul>

## Examinations/Key Assessments

GCSE Maths is assessed by three written papers; paper 1 is a non-calculator assessment and a calculator may be used for papers 2 and 3. Each exam will contribute to your overall grade. There are two tiers of entry, Foundation (grades 1 to 5) and higher tier (grades 4 to 9), and assessment is by written examination only.

## Homework (Including Links)

This is set once a week and is designed to support the work done during lessons. The work will be set on Sparx maths which is programmed by an AI system designed to bespoke the tasks to suit the needs of each individual student. There are video available for the students to watch on questions that they are struggling with. All pupils will be given A5 homework books. These should be use to help them complete working out that will be require for their homework. They should also be use to write down questions and answers in order to help them with the Sparx bookmark questions. As well as using Sparx to complete compulsory homework, students can also complete independent tasks that will gain them XP points and prizes. We encourage that all pupils should strive to not only complete their homework, but also complete as many independent tasks as they can.

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As it is school policy to set homework, a detention will be issued. Parents will receive an email every Sunday to notify them of any incomplete homework.

Prior to assessment periods, pupils may receive an increased volume of homework or independent study work. This will help them to prepare for exam revision in the future.

## How Parents can Help

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  - Sparx Maths - <https://sparxmaths.com/>
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  - Just Maths - <https://justmaths.co.uk/>
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- Ensure that basic equipment is brought to each lesson. A pen, pencil and ruler are the minimum requirements.
- Encourage the use of the Internet for homework completion and revision (see useful websites list).
- Talk about the Mathematics that your child is studying and in the world around them. Encourage the use of the correct terms and language (see parent booklet on school website).
- Ensure pupils revise for assessment tests.

# Year 11 Mathematics (KS4)

## Curriculum Overview

### Brief Overview

<u>Higher</u>	<u>Foundation</u>
<b>Term 1</b> <ul style="list-style-type: none"> <li>➤ Multiplicative Reasoning</li> <li>➤ Further Statistics</li> <li>➤ Functions &amp; Surds</li> <li>➤ Similarity &amp; Trigonometry</li> <li>➤</li> </ul>	<b>Term 1</b> <ul style="list-style-type: none"> <li>➤ Transformations &amp; Vectors</li> <li>➤ Ratio</li> <li>➤ Direct &amp; Inverse Proportion</li> <li>➤ Multiplicative Reasoning</li> <li>➤ Similarity</li> </ul>
<b>Term 2</b> <ul style="list-style-type: none"> <li>➤ Probability</li> <li>➤ Quadratic &amp; Cubic's</li> <li>➤ Perimeter, Area &amp; Volume 2</li> <li>➤ Circle Theorems</li> <li>➤ Algebraic Fractions</li> </ul>	<b>Term 2</b> <ul style="list-style-type: none"> <li>➤ Probability</li> <li>➤ Perimeter, Area &amp; Volume 2</li> <li>➤ Fractions, Indices &amp; Standard Form</li> <li>➤ Right-Angled Triangles</li> </ul>
<b>Term 3</b> <ul style="list-style-type: none"> <li>➤ Vectors</li> <li>➤ Proportion Graphs</li> <li>➤ Proof</li> </ul>	<b>Term 3</b> <ul style="list-style-type: none"> <li>➤ Constructions, Loci &amp; Bearings</li> <li>➤ Quadratics Equations &amp; Graphs</li> </ul>

There is now a greater emphasis on problem-solving skills, which will require a level of skill in each of these areas and will test your ability to apply these skills in a variety of situations. Work in lessons can be individual, paired, group work or whole-class discussion. You may be completing an exercise to practise a skill, or discussing a new concept to address misconceptions and alternative methods. To do this, you will be taught how and when to use appropriate mathematical software and calculators. You will learn written methods and formulae required to solve problems, given exam practice questions and shown how to work independently and revise for your exams.

### New Knowledge (What we would like students to know and understand by the end of GCSE)

Throughout the GCSE curriculum there is an emphasis on exam practice, understanding how to structure an answer, problem solving and time keeping. Along with learning the content, pupils will build resilience and independence which are key skills for them to carry forward into the next part of their education.

### Disciplinary Vocabulary

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### Prior Learning and Recall

<u>Higher</u>	<u>Foundation</u>
<ul style="list-style-type: none"> <li>➤ Factors, multiples and primes</li> <li>➤ Converting between fractions, decimals and percentages</li> <li>➤ Algebraic manipulation including simplifying expressions, solving multi step equations, expanding brackets and factorising.</li> <li>➤ Using mathematical equipment such as a protractor and compass</li> <li>➤ Properties of 2D and 3D shapes</li> <li>➤ Area and volume of 2D and 3D shapes</li> <li>➤ Angle facts</li> <li>➤ Proportion</li> </ul>	<ul style="list-style-type: none"> <li>➤ Number bonds</li> <li>➤ Place value</li> <li>➤ Operating with powers of 10</li> <li>➤ Calculating using the four operations, including with fractions and decimals</li> <li>➤ Using mathematical equipment such as a protractor and compass</li> <li>➤ Recognising a sequence both numerically and graphically.</li> <li>➤ Recall the formulae for area of 2D shapes</li> <li>➤ Calculating averages</li> <li>➤ Angles facts</li> </ul>

- Constructing graphs
- Calculating averages
- Recognising a sequence both numerically and graphically.
- Calculating using the four operations, including with fractions and decimals.

### Examinations/Key Assessments

GCSE Maths is assessed by three written papers; paper 1 is a non-calculator assessment and a calculator may be used for papers 2 and 3. Each exam will contribute to your overall grade. There are two tiers of entry, Foundation (grades 1 to 5) and higher tier (grades 4 to 9), and assessment is by written examination only.

### Homework (Including Links)

This is set once a week and is designed to support the pupils with their upcoming GCSE exams. Pupils will have an exam practice lesson where they will be taught how to understand and answer exam style questions. Pupils will then be given an exam paper to take home so that they can practice these skills at home. The task will be detailed on *Satchel One*, so that pupils and their parents can easily access the work and deadlines. As it is school policy to set homework, a detention will be issued and/or a letter sent home if they are not completed regularly. Prior to assessment periods, pupils may receive an increased volume of homework or independent study work. This will help them to prepare for exam revision in the future. Homework may be set online using *MyMaths* or *MathsWatch* websites. This provides support and immediate feedback on the work you have done and allows the class teacher to keep a record of a pupil's progress.

### How Parents can Help

- Other useful website to use:
  - MyMaths - <https://www.mymaths.co.uk/>
  - Sparx Maths - <https://sparxmaths.com/>
  - Oak Academy - <https://www.thenational.academy/>
  - Corbett Maths - <https://corbettmaths.com/>
  - Maths Genie - <https://www.mathsgenie.co.uk/>
  - Just Maths (more tailored towards GCSE) - <https://justmaths.co.uk/>
- Check *Satchel One* regularly and ensure all work is completed to a good standard.
- Ensure that basic equipment is brought to each lesson. A pen, pencil and ruler are the minimum requirements.
- Encourage the use of the Internet for homework completion and revision (see useful websites list).
- Talk about the Mathematics that your child is studying and in the world around them. Encourage the use of the correct terms and language (see parent booklet on school website).
- Ensure pupils revise for assessment tests.

# Year 12/13 Mathematics (KS5)

## Curriculum Overview

### Brief Overview

<u>Term 1</u>	<u>Term 2</u>	<u>Term 3</u>
<b>Year 12</b> <ul style="list-style-type: none"> <li>➤ Algebra Expressions</li> <li>➤ Quadratics</li> <li>➤ Equations and Inequalities</li> <li>➤ Graphs and Transformation</li> <li>➤ Straight Line Graphs</li> <li>➤ Circles</li> <li>➤ Data Collection</li> <li>➤ Measures of Location and Spread</li> <li>➤ Introduction to Mechanics</li> <li>➤</li> </ul>	<ul style="list-style-type: none"> <li>➤ Algebraic Methods</li> <li>➤ Binomial Expansion</li> <li>➤ Trigonometric Ratios</li> <li>➤ Trigonometric Identities &amp; Equations</li> <li>➤ Representations of Data</li> <li>➤ Correlation</li> <li>➤ Probability</li> <li>➤ Constant Acceleration</li> </ul>	<ul style="list-style-type: none"> <li>➤ Vectors</li> <li>➤ Differentiation</li> <li>➤ Integration</li> <li>➤ Exponentials and Logarithms</li> <li>➤ Statistical Distributions</li> <li>➤ Hypothesis</li> <li>➤ Forces and Motion</li> <li>➤ Variable Acceleration</li> </ul>
<b>Year 13</b> <ul style="list-style-type: none"> <li>➤ Algebraic Methods</li> <li>➤ Functions and Graphs</li> <li>➤ Sequences and Series</li> <li>➤ Binomial Expansion</li> <li>➤ Radians</li> <li>➤ Regression, Correlation &amp; Hypothesis Testing</li> <li>➤ Moments</li> </ul>	<ul style="list-style-type: none"> <li>➤ Trigonometric Functions</li> <li>➤ Trigonometry and Modelling</li> <li>➤ Parametric Equations</li> <li>➤ Differentiation</li> <li>➤ Conditional Probability</li> <li>➤ Friction</li> <li>➤ Projectiles</li> </ul>	<ul style="list-style-type: none"> <li>➤ Numerical Methods</li> <li>➤ Integration</li> <li>➤ Vectors</li> <li>➤ Normal Distribution</li> <li>➤ Applications of Forces</li> <li>➤ Further Mechanics</li> </ul>

The study of A-level Mathematics can be both an exciting and challenging prospect. You will develop your abilities to reason logically, generalise and construct mathematical proofs, using mathematics as an effective means of communication. You will relate mathematics to real life situations, representing various scenarios mathematically by constructing models and theorems. Several University courses require A-level mathematics. If you are thinking of studying Science, Engineering, Architecture, Accounting, Business, Computing or Teaching A-level Mathematics can provide you with the skills necessary to succeed.

### New Knowledge (What we would like students to know and understand by the end of A level)

- Circles (when the centre is not at origin)
- Trigonometric ratios and identities
- Logarithms
- Differentiation
- Integration
- Parametric equations
- Radians
- Binomial expansion

- Sum of a series
- Algebraic proof
- Statistical models

#### Disciplinary Vocabulary

<https://app.weduc.co.uk/get/external/p/id/7d72b30235a6c9d455f0a0574889975103a98112997c484c783eb30565ba32a8.xlsx>

#### Prior Learning and Recall

- Laws of indices
- Factorising quadratics
- Completing the square
- Using quadratic equation
- Solving simultaneous equations
- Plotting/sketching linear graphs
- Transformation of graphs (when the graph is already drawn)

#### Examinations/Key Assessments

Both AS and A level Mathematics are assessed by a set of terminal exams. A minimum specification calculator is required for these examinations.

#### Homework (Including Links)

A substantial homework is set at least once a week and will be detailed on *Satchel One*. Past papers and revision guides are available for all students.

#### How Parents can Help

- Check *Show My Homework* regularly encourage your son/daughter to complete all work to a good standard.
- Encourage the use of the Internet for homework completion, revision and independent study (see useful websites list).
- Ensure pupils revise for assessment tests and mock exams.
- Revision guides and workbooks are available for purchase from the maths department.

# Year 12/13 Further Mathematics (KS5)

Mathematics aim for year 7:

## Curriculum Overview

### Brief Overview

<u>Term 1</u>	<u>Term 2</u>	<u>Term 3</u>
<b>Year 12</b> <ul style="list-style-type: none"> <li>➤ Complex Numbers</li> <li>➤ Argand Diagrams</li> <li>➤ Series</li> <li>➤ Roots of Polynomials</li> <li>➤ Algorithms</li> <li>➤ Graphs and Networks</li> <li>➤ Discrete Random Variables</li> </ul>	<ul style="list-style-type: none"> <li>➤ Volumes of Revolution</li> <li>➤ Matrices</li> <li>➤ Linear Transformations</li> <li>➤ Algorithms on Graphs</li> <li>➤ Route Inspection</li> <li>➤ Poisson Distributions</li> </ul>	<ul style="list-style-type: none"> <li>➤ Proof by Induction</li> <li>➤ Vectors</li> <li>➤ Linear Programming</li> <li>➤ Critical Path Analysis</li> <li>➤ Hypothesis Testing</li> <li>➤ Chi-squared Tests</li> </ul>
<b>Year 13</b> <ul style="list-style-type: none"> <li>➤ Complex Numbers</li> <li>➤ Series</li> <li>➤ Methods of Calculus</li> <li>➤ Volumes of Revolution</li> <li>➤ The Travelling Salesman Problem</li> </ul>	<ul style="list-style-type: none"> <li>➤ Polar Coordinates</li> <li>➤ Hyperbolic Functions</li> <li>➤ Methods in Differential Equations</li> <li>➤ This Simplex Algorithm</li> <li>➤ Geometric and Negative Binomial Distributions</li> </ul>	<ul style="list-style-type: none"> <li>➤ Modelling with Differential Equations</li> <li>➤ Trigonometric Ratios</li> <li>➤ Central Limit Theorem</li> <li>➤ Probability Generating Functions</li> <li>➤ Quality of Tests</li> </ul>

The study of A-level Further Mathematics can be both an exciting and challenging prospect. You will develop your abilities to reason logically, generalise and construct mathematical proofs, using mathematics as an effective means of communication. You will relate mathematics to real life situations, representing various scenarios mathematically by constructing models and theorems. Several University courses require A-level Further Mathematics to study subjects such as Mathematics or Physics. More Universities now ask for the A-level Further Mathematics as a desirable A-Level for pupils to have taken in order to start their courses.

### New Knowledge (What we would like students to know and understand by the end of A-Level Further Maths)

- Complex numbers with Argand diagrams
- Roots of polynomials (higher than quadratic)
- Volumes of 3D shapes using volumes of revolutions
- Matrices with linear transformation
- Proof using proof by induction
- Polar coordinates
- Hyperbolic Functions
- Complex differential equations
- Algorithms
- Critical path analysis
- Linear programming

### Disciplinary Vocabulary

<https://app.weduc.co.uk/get/external/p/id/7d72b30235a6c9d455f0a0574889975103a98112997c484c783eb30565ba32a8.xlsx>

### Prior Learning and Recall

- Laws of indices
- Factorising quadratics
- Completing the square
- Using quadratic equation
- Solving simultaneous equations
- Plotting/sketching linear graphs
- Transformation of graphs (when the graph is already drawn)

Pupils will also be required to know majority of A-Level Maths which will be taught to them along side Further Maths. Therefore students will be given prior knowledge homeworks and activities in lesson to help gain an understanding of aspects taught in A-Level Maths, to allow them to access the A-Level Further Maths content.

### Examinations/Key Assessments

Both AS and A level Further Mathematics are assessed by a set of terminal exams. A minimum specification calculator is required for these examinations.

### Homework (Including Links)

A substantial homework is set at least once a week and will be detailed on *Show My Homework*. Past papers and revision guides are available for all students.

### How Parents can Help

- Check *Show My Homework* regularly encourage your son/daughter to complete all work to a good standard.
- Encourage the use of the Internet for homework completion, revision and independent study (see useful websites list).
- Ensure pupils revise for assessment tests and mock exams.
- Revision guides and workbooks are available for purchase from the maths department.