

# Mathematics

**Mathematics: working hard together, achieving together, making every lesson count**

The Mathematics Team will provide students with exciting, relevant and challenging Mathematics, delivered by dedicated staff. Students will understand the underlying principles of the mathematics they learn, making links and developing reasoning skills and logical thinking.

They will progress towards being independent mathematicians who take ownership of their learning and can identify correct and incorrect work for themselves. Students will have their confidence encouraged and their complacency challenged in order to maximise potential. To achieve this, staff will design and develop simple and effective systems and interesting and effective teaching ideas and resources to enable classroom delivery and promote mathematics across the school.

Autumn		Spring		Summer	
Data Handling, data collection, representing and analysing data.	Factoring Expressions, Solving Equations, including Numerical Methods	Inverse operations and Accuracy. Angles Triangles Polygons, Nets, plans and elevations	Factors, Multiples, Primes (HCF/LCM) Probability	Perimeter, Area and Volume, including parts of a circle Averages and measure of Spread	Changing the subject of a formula  Linear Graphs
Formulae and Expressions	Fractions, Decimals and Percentages Index Laws	Ratio			

Students will receive one piece of homework per week that will be marked and returned to the student at the next available opportunity. The piece of work will be designed to last between 1 hour and 1½. Unless otherwise stated by the teacher students should complete homework in their book and show all working out. Homework could take a variety of formats including:

- Worksheet
- Research Project
- MathsWatch
- Revision
- Exam Practice

In Year 9 your child will continue their studies on either the Foundation or Higher pathway. Again, there is a flexible approach should the need arise for a change in pathway. In the year 9 programme of study, both pathways have been designed to complement each other should a change be required.

Higher		
Unit	Duration (WEEKS)	Learning Objectives/Outcomes
Data Handling	5	<ul style="list-style-type: none"> <li>Classifying data</li> <li>Collecting Data</li> <li>Analysing Data</li> <li>Interpreting Data</li> <li>Sampling</li> </ul>
The four operations, cubes, cube roots and squares	1	<ul style="list-style-type: none"> <li>Calculations using the correct order of operations</li> <li>Recall integer squares from <math>1 \times 1</math> to <math>15 \times 15</math> and their corresponding square roots.</li> <li>Recall the Cubes of 2, 3 4, 5 and 10 and their corresponding cube roots.</li> <li>Solve problems involving the four operations</li> </ul>
Expressions, Equations and Formulae	4	<ul style="list-style-type: none"> <li>Forming Expressions</li> <li>Simplifying Expressions</li> <li>Expanding Brackets</li> <li>Factorising Expressions</li> <li>Solving Equations including Numerical Methods</li> <li>Substitution into Formulae</li> </ul>
Fractions, Decimals and Percentages	2	<ul style="list-style-type: none"> <li>FDP equivalence</li> <li>Fours rules of fractions</li> <li>Ordering rational numbers</li> <li>Calculations involving Percentages</li> <li>Percentage Change</li> <li>Expressing one quantity as a percentage of another quantity.</li> </ul>
Index Laws	2	<ul style="list-style-type: none"> <li>Simplifying Expressions using the rules of indices</li> <li>Calculations involving the rules of indices</li> </ul>
Percentages; Compound interest, Depreciation and Reverse problems	1	<ul style="list-style-type: none"> <li>Compound Interest</li> <li>Depreciation</li> <li>Reverse Percentages</li> </ul>
Inverse Operations and Accuracy	1	<ul style="list-style-type: none"> <li>Understand 'reciprocal' as multiplicative inverse, knowing that any non-zero number multiplied by its reciprocal is 1</li> <li>Use given calculations to find the answers to other calculations.</li> <li>Rounding values to a given number of decimals places and significant figures.</li> <li>Estimate the answers to calculations by rounding to one significant figure.</li> </ul>

Angles and Triangles	2	<ul style="list-style-type: none"> <li>• Classify Triangles</li> <li>• Calculations of unknown angles in or around triangles</li> <li>• Calculations of angles on parallel lines</li> <li>• Angle reasoning</li> <li>• Problem solving involving angles</li> </ul>
Polygons	1	<ul style="list-style-type: none"> <li>• Classifying Polygons</li> <li>• Calculating interior angles with polygons</li> <li>• Calculating exterior angles with polygons</li> <li>• Calculating unknown angles within problems involving conjoined polygons</li> <li>• Understand why some polygons tessellate.</li> </ul>
Net, Plans and Elevations	1	<ul style="list-style-type: none"> <li>• Draw accurate nets of given solids</li> <li>• Recognise solids from given nets</li> <li>• Draw and interpret accurate diagrams involving plans and elevations</li> <li>• Understand and recognize 3D coordinates</li> </ul>
Ratio	2	<ul style="list-style-type: none"> <li>• Share quantities in a given ratio</li> <li>• Simplify ratio including 1:n and n:1</li> <li>• Solve problems involving more than one ratio</li> <li>• Solve problems involving ratio and algebra</li> <li>• Solve problems involving ratio and geometry</li> </ul>
Factors, multiples and Primes	1	<ul style="list-style-type: none"> <li>• Express values as a product of their prime factors</li> <li>• Solve problems involving HCF and LCM</li> <li>• Use products of primes to calculate HCF and LCM</li> </ul>
Probability	3	<ul style="list-style-type: none"> <li>• Calculating probability</li> <li>• Experimental probability (Relative Frequency)</li> <li>• Sample space diagrams</li> <li>• Independent and dependent events</li> <li>• Probability Tree Diagrams</li> </ul>
Perimeter, Area and Volume	3	<ul style="list-style-type: none"> <li>• Area and Perimeter of 2D Shapes</li> <li>• Volume of solids</li> <li>• Calculating areas of sectors</li> <li>• Calculating Arc lengths</li> </ul>
Handling Data	2	<ul style="list-style-type: none"> <li>• Scatter Graphs</li> <li>• Cumulative Frequency</li> <li>• Box plots</li> <li>• Histograms</li> <li>• Problems involving averages.</li> </ul>
Changing the subject of formulae	1	<ul style="list-style-type: none"> <li>• Rearrange given formulae</li> <li>• Rearrange formulae by a given subject that appears more than once.</li> </ul>
Linear Graphs	2	<ul style="list-style-type: none"> <li>• Plotting linear graphs from tables of values</li> <li>• Recognise Gradient and y-intercept.</li> <li>• Plotting linear graphs using the gradient and intercept</li> </ul>



- |  |  |  |
|--|--|--|
|  |  | <ul style="list-style-type: none"><li>• Calculating the equations of parallel and perpendicular lines</li><li>• Calculating the equations of lines given two points.</li></ul> |
|--|--|--|





Foundation		
Unit	Duration (WEEKS)	Learning Objectives/Outcomes
Data Handling	5	<ul style="list-style-type: none"> <li>Classifying data</li> <li>Collecting Data</li> <li>Analysing Data</li> <li>Interpreting Data</li> <li>Sampling</li> </ul>
The four operations, cubes, cube roots and squares	1	<ul style="list-style-type: none"> <li>Calculations using the correct order of operations</li> <li>Recall integer squares from <math>1 \times 1</math> to <math>15 \times 15</math> and their corresponding square roots.</li> <li>Recall the Cubes of 2, 3, 4, 5 and 10 and their corresponding cube roots.</li> <li>Solve problems involving the four operations</li> </ul>
Expressions, Equations and Formulae	4	<ul style="list-style-type: none"> <li>Forming Expressions</li> <li>Simplifying Expressions</li> <li>Expanding Brackets</li> <li>Factorising Expressions</li> <li>Solving Equations including Numerical Methods</li> <li>Substitution into Formulae</li> </ul>
Fractions, Decimals and Percentages	2	<ul style="list-style-type: none"> <li>FDP equivalence</li> <li>Fours rules of fractions</li> <li>Ordering rational numbers</li> <li>Calculations involving Percentages</li> <li>Percentage Change</li> <li>Expressing one quantity as a percentage of another quantity.</li> </ul>
Index Laws	2	<ul style="list-style-type: none"> <li>Simplifying Expressions using the rules of indices</li> <li>Calculations involving the rules of indices</li> </ul>
Percentages; Simple Interest and Compound Interest	1	<ul style="list-style-type: none"> <li>Simple Interest</li> <li>Compound Interest</li> </ul>
Inverse Operations & Accuracy	1	<ul style="list-style-type: none"> <li>Understand 'reciprocal' as multiplicative inverse, knowing that any non-zero number multiplied by its reciprocal is 1</li> <li>Use given calculations to find the answers to other calculations.</li> <li>Rounding values to a given number of decimals places and significant figures.</li> </ul>

		<ul style="list-style-type: none"> <li>Estimate the answers to calculations by rounding to one significant figure.</li> </ul>
Angles and Triangles	2	<ul style="list-style-type: none"> <li>Classify Triangles</li> <li>Calculations of unknown angles in or around triangles</li> <li>Calculations of angles on parallel lines</li> <li>Angle reasoning</li> <li>Problem solving involving angles</li> </ul>
Polygons	1	<ul style="list-style-type: none"> <li>Classifying Polygons</li> <li>Calculating interior angles with polygons</li> <li>Calculating exterior angles with polygons</li> <li>Calculating unknown angles within problems involving conjoined polygons</li> <li>Understand why some polygons tessellate.</li> </ul>
Net, Plans and Elevations	1	<ul style="list-style-type: none"> <li>Draw accurate nets of given solids</li> <li>Recognise solids from given nets</li> <li>Draw and interpret accurate diagrams involving plans and elevations</li> </ul>
Ratio	2	<ul style="list-style-type: none"> <li>Share quantities in a given ratio</li> <li>Simplify ratio including 1:n and n:1</li> <li>Solve problems involving ratio and algebra</li> <li>Solve problems involving ratio and geometry</li> </ul>
Factors, multiples and Primes	1	<ul style="list-style-type: none"> <li>Express values as a product of their prime factors</li> <li>Solve problems involving HCF and LCM</li> <li>Use products of primes to calculate HCF and LCM</li> </ul>
Probability	3	<ul style="list-style-type: none"> <li>Calculating probability</li> <li>Experimental probability (Relative Frequency)</li> <li>Sample space diagrams</li> <li>Independent and dependent events</li> <li>Probability Tree Diagrams</li> </ul>
Perimeter, Area and Volume	3	<ul style="list-style-type: none"> <li>Area and Perimeter of 2D Shapes</li> <li>Volume of Prisms</li> <li>Calculating areas of sectors</li> <li>Calculating Arc lengths</li> </ul>
Handling Data	2	<ul style="list-style-type: none"> <li>Scatter Graphs</li> <li>Pie Charts</li> <li>Pictograms</li> <li>Stem and Leaf Diagrams</li> <li>Problems involving averages.</li> </ul>
Changing the subject of formulae	1	<ul style="list-style-type: none"> <li>Rearrange given formulae</li> </ul>

Linear Graphs	2	<ul style="list-style-type: none"> <li>• Plotting linear graphs from tables of values</li> <li>• Recognise Gradient and y-intercept.</li> <li>• Plotting linear graphs using the gradient and intercept</li> <li>• Recognising the equations of parallel lines</li> </ul>
---------------	---	---

