

## Subject: Mathematics

These are the objectives a student on each Pathway needs to achieve by the end of year 7, to ensure they are making expected progress:

	Outline of Objective	Outline of Objective	Outline of Objective	Outline of Objective
Pathway 1	<p><u>All objectives included here and all objectives stated in Pathway 2</u></p> <p><u>Half Term 1A</u> <u>Algebraic Thinking</u></p> <ul style="list-style-type: none"> <li>This introductory unit is designed to be accessed by all students – exemplification documents will illustrate tasks suitable for students if different levels of prior attainment including challenge for higher attainers.</li> </ul>	<p><u>Half Term 1B</u> <u>Place Value and Proportion</u></p> <ul style="list-style-type: none"> <li>Explore and use standard index form</li> <li>Explore fractions above one</li> <li>Convert multiples of one eighth to decimals and percentages</li> </ul>	<p><u>Half Term 2A</u> <u>Application of Number</u></p> <ul style="list-style-type: none"> <li>Explore addition of numbers given in standard form</li> <li>Evaluate the area of a trapezium</li> <li>Find the HCF and LCM of algebraic expressions</li> <li>Use fractions greater than 1</li> </ul>	<p><u>Half Term 2B</u> <u>Directed Number and Fractional Thinking</u></p> <ul style="list-style-type: none"> <li>Negative square roots</li> <li>Higher powers</li> </ul>
	<p><u>Half Term 3A</u> <u>Lines and Angles</u></p> <ul style="list-style-type: none"> <li>Understand and use parallel line rules</li> <li>Understand and use the sum of angles in any polygon</li> <li>Derive simple proofs using angles rules.</li> </ul>	<p><u>Half Term 3B</u> <u>Reasoning with Number</u></p> <ul style="list-style-type: none"> <li>Understand and use the complement of a set</li> <li>Use prime factors to find HCFs and LCMs</li> </ul>		
Pathway 2	<p><u>Half Term 1A</u> <u>Algebraic Thinking</u></p> <p>Exploring Sequences</p> <ul style="list-style-type: none"> <li>Describe and continue sequences in diagram and number forms, both linear and non-linear</li> <li>Compare numerical and graphical forms.</li> </ul> <p>Understanding and using algebraic notation</p>	<p><u>Half Term 1B</u> <u>Place Value and Proportion</u></p> <p>Place Value and Ordering</p> <ul style="list-style-type: none"> <li>Recognise and use integer place value up to one billion.</li> <li>Recognise and use decimal place value to at least hundredths</li> <li>Work out intervals and use number lines</li> <li>Compare and order numbers</li> </ul>	<p><u>Half Term 2A</u> <u>Application of Number</u></p> <p>Addition and Subtraction</p> <ul style="list-style-type: none"> <li>Use mental and formal written methods of addition with integers and decimals, including choosing the most appropriate method.</li> <li>Solve problems in the context of perimeter, money and frequency trees and tables.</li> <li>Solve problems in the context of bar charts and line charts.</li> </ul>	<p><u>Half Term 2B</u> <u>Directed number and Fractional Thinking</u></p> <p>Directed Number</p> <ul style="list-style-type: none"> <li>Order directed numbers, both in contextualised and abstract situations</li> <li>Revisit four operations to include directed number</li> <li>Use a calculator with directed number</li> <li>Solve two step equations ( with and without a calculator)</li> <li>Use the order of operations</li> </ul>

## KS3 Assessment – Year 7 Progress Grid

- Use single function machines and series of two function machines with numbers, bar models and letters.
- Use and interpret algebraic notation.
- Understand and use inverse operations.
- Form and substitute into expressions, including to generate sequences.
- Represent functions graphically.

### Equality and Equivalence

- Understand equality
- Use fact families
- Form and solve one step equations
- Understand equivalence of algebraic expressions
- Collect like terms.

### Half Term 3A Lines and Angles

#### Construction and measuring

- Understand and use letting and labelling notation for lines and angles.
- Draw and measure lines and angles accurately
- Classify angles
- Identify and draw parallel and perpendicular lines
- Recognise types of triangle, quadrilateral and other polygons
- Construct triangles given SSS, SAS, ASA
- Draw and interpret pie charts

### Geometric Reasoning

- Use ordered lists to find the range and the median of a set of numbers
- Round numbers to positive powers of ten
- Round numbers to one significant figure.

### Fractions, decimals and percentage equivalence.

- Represent tenths and hundredths on diagrams and number lines
- Interchange between fractions, decimals and percentages for multiples of one tenth and one quarter.
- Interpret pie charts.
- Equivalent fractions
- Convert between other fraction, decimals and percentages.

### Half Term 3B Reasoning with Number

#### Developing number Sense

- Mental arithmetic strategies
- Use known facts to derive other facts
- Evaluate an algebraic expression given a related fact
- Use estimation

#### Sets and Probability

- Understand and use set notation
- Draw and interpret Venn diagrams
- Understand and use the language of probability
- Calculate the probability of a single event
- Use the sum of probabilities of an event is 1

### Multiplication and division

- Multiply by 10, 100 and 1000, 0.1 and 0.01, and convert metric units.
- Use mental and formal written methods of multiplication and division.
- Find HCF and LCM of small numbers
- Evaluate areas of triangles, rectangles and parallelograms.
- Find the mean of a set of numbers.
- Find simple fractions and percentages of amounts.
- Begin to use the order of operations.

### Fractions and percentages of amounts

- Work out simple fractions and percentages of amounts, with and without a calculator.

### Adding and subtracting fractions

- Represent tenths and hundredths on diagrams and number lines.
- Convert mixed numbers and improper fractions with the same denominator, one denominator a multiple of the other and different denominators.
- Add and subtract fractions and decimals to each other.

## KS3 Assessment – Year 7 Progress Grid

<b>Pathway 3</b>	<ul style="list-style-type: none"> <li>Calculate and use angles at a point, angles on a straight line and vertically opposite angles.</li> <li>Calculate missing angles in triangle and quadrilaterals.</li> </ul>	<p>Prime numbers and Proof</p> <ul style="list-style-type: none"> <li>Recognise prime, square and triangle numbers</li> <li>Express a number as a product of prime factors</li> <li>Powers and roots</li> <li>Make and test conjectures</li> <li>Understand and use counter examples</li> </ul>		
	<u>Half Term 1A</u> <u>Algebraic Thinking</u>	<u>Half Term 1B</u> <u>Place Value and Proportion</u>	<u>Half Term 2A</u> <u>Application of Number</u>	<u>Half Term 2B</u> <u>Directed number and Fractional Thinking</u>
	Exploring Sequences <ul style="list-style-type: none"> <li>Describe and continue sequences in diagram and number forms, both linear and non-linear</li> </ul>	Place Value and Ordering <ul style="list-style-type: none"> <li>Recognise and use integer place value up to one billion.</li> <li>Recognise and use decimal place value to at least hundredths</li> <li>Work out intervals and use number lines</li> <li>Compare and order numbers</li> <li>Use ordered lists to find the range and the median of a set of numbers</li> </ul>	Addition and Subtraction <ul style="list-style-type: none"> <li>Use mental and formal written methods of addition with integers and decimals, including choosing the most appropriate method.</li> <li>Solve problems in the context of perimeter, money and frequency trees and tables.</li> <li>Solve problems in the context of bar charts and line charts.</li> </ul>	Directed Number <ul style="list-style-type: none"> <li>Order directed numbers, both in contextualised and abstract situations</li> <li>Revisit four operations to include directed number</li> <li>Use a calculator with directed number</li> <li>Solve two step equations ( with and without a calculator)</li> <li>Use the order of operations</li> </ul>
	Understanding and using algebraic notation <ul style="list-style-type: none"> <li>Use single function machines and series of two function machines with numbers, bar models and letters.</li> <li>Use and interpret algebraic notation.</li> <li>Understand and use inverse operations.</li> <li>Form and substitute into expressions, including to generate sequences.</li> </ul>	Fractions, decimals and percentage equivalence. <ul style="list-style-type: none"> <li>Represent tenths and hundredths on diagrams and number lines</li> <li>Interchange between fractions, decimals and percentages for multiples of one tenths and one quarter.</li> <li>Equivalent fractions</li> </ul>	Multiplication and division <ul style="list-style-type: none"> <li>Multiply by 10,100 and 1000, and convert metric units.</li> <li>Use mental and formal written methods of multiplication and division.</li> <li>Find HCF and LCM of small numbers</li> <li>Evaluate areas of triangles and rectangles</li> <li>Find the mean of a set of numbers.</li> <li>Find simple fractions and percentages of amounts.</li> <li>Begin to use the order of operations.</li> </ul>	Adding and subtracting fractions <ul style="list-style-type: none"> <li>Represent tenths and hundredths on diagrams and number lines.</li> <li>Convert mixed numbers and improper fractions with the same denominator and where one denominator is a multiple of the other</li> <li>Add and subtract fractions and decimals to each other.</li> </ul>
	Equality and Equivalence <ul style="list-style-type: none"> <li>Understand equality</li> <li>Use fact families</li> <li>Form and solve one step equations</li> <li>Understand equivalence of algebraic expressions</li> <li>Collect like terms.</li> </ul>			
	<u>Half Term 3B</u> <u>Reasoning with Number</u>			

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#### Prime numbers and Proof

- Recognise prime, square and triangle numbers
- Express a number as a product of prime factors
- Powers and roots