Park School, Bolton Impact Trust Maths Curriculum

Rationale

We believe that a high quality mathematics education provides a foundation for understanding the world. For thousands of years Maths has been the key to finding solutions to the world's problems and is essential in continuing to solve problems in our world today. At Park School our pupils need a sound grasp of mathematical knowledge and skills in order to apply mathematical thinking effectively to solve problems successfully. Our Maths curriculum ensures that pupils develop these functional skills to help our pupils in everyday life and to access other subjects like science, art and technology. These skills will also play a significant part in securing their future career and in ensuring their financial literacy. We strive to equip pupils with the skills to become resilient, fluent and curious mathematicians, and we hope to share our own appreciation of the beauty and power of mathematics.

Knowledge

We ensure that throughout the Maths curriculum pupils acquire the key knowledge required to:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Character

We ensure that pupils develop their own character attributes by engaging with challenging problems, building their resiliency to tackle this by applying reason and logic. Pupils will learn to work with others, to justify their thinking and to develop their arguments using their mathematical knowledge.

Creativity

We ensure that pupils develop their understanding of how maths is linked with creative subjects such as art and music. We will also encourage pupils to approach problems creatively by exploring possible solutions using their knowledge and understanding of mathematics, and the understanding that some solutions are still yet to be found.

Innovative Thinking

We inspire pupils to use their mathematical knowledge in many different contexts to help them to solve problems. We encourage them to develop a critical, analytical and reasoned approach to problem solving that will serve them well in their academic studies and in adult life.

Transform

Pupils will transform the essential knowledge and skills that they are taught in the Maths curriculum into long-lasting success in the world of further study and work. Most forms of employment require the knowledge and skills that the maths curriculum will provide them with, and they will also be equipped to manage their personal finances and make sensible, well-thought-out and reasoned decisions.

Curriculum Design

The Maths curriculum for Bolton Impact Trust is carefully planned and sequenced so that knowledge builds upon prior knowledge and as pupils move through the academic year and the various pathways, knowledge and understanding is deepened and regularly revisited. Our curriculum topics are planned in a way which ensures that our pupils can experience the full programme of study at both key stages which build in depth and level of challenge for each term that they are with us. Knowledge and skills are repeated regularly to enable pupils to retrieve prior learning regularly, to increase their confidence, and to address the needs of the pupils who join us throughout the year and with vastly different abilities and experiences of the Maths curriculum prior to joining us. Pupils who leave us to return to mainstream are able to re-engage with the Maths curriculum there because we do not narrow their offer when they are with us.

The knowledge delivered in our mathematics curriculum is the product of careful selection, sequencing and linking of declarative, procedural and conditional knowledge. We believe, pupils need to systematically acquire core mathematical facts, concepts, methods and strategies to be able to experience success when problem-solving and in order to become proficient mathematicians. The curriculum is designed to clearly highlight the type of knowledge pupils are working on, and the G.C.S.E level equivalent of that work, be that Pre GCSE up to Grade 9. At the start of each topic, pupils are given a knowledge organiser which includes our curriculum intent broken down into mini steps, so it is clear to all what journey the pupils are following.

Mathematics is taught in single lessons of 45 minutes, which suits our pupils' characters and needs perfectly. All pupils have Maths 5 times per week, always before lunch. We follow a curriculum, consistent with the other academies in the trust, which identifies when each topic will be delivered and every small step associated with each topic. These small steps match the BIT levels we have adopted.

At Park School we record on a PLP what each pupil has completed for every lesson. This has many benefits. As a teacher we can readily give information to parents, pupils or host schools regarding the work they have completed. If we keep a pupil longer than a year, the PLP will highlight the small step levels they achieved previously so we can easily build on their learning. Lastly each pupil has one lesson per week dedicated to personalised learning. This time may be spent completing work towards a functional qualification matched to their ability, or through use of the PLP the teacher can find areas of weakness/ gaps in learning and aim to remedy this.

We aim to meet and greet the pupils for every lesson and ensure that they are ready to learn straight away. Should pupils need some time to compose themselves, we allow this either in the classroom or outside the room with a mentor. Entry tasks usually take the form of retrieval activities, challenging pupils to remember work from a previous lesson that same week, a lesson from a previous topic completed in that year, or a topic they completed a long time ago which may be pertinent to the lesson ahead.

We use strategic cold calling when asking questions to the class as many of our pupils find this difficult to cope with. As specialists who know the group well we always try to use probing questions and review learning throughout the lesson, however this could be on a 1-2-1 basis rather than openly so as to avoid anxieties. We also allow some pupils to write in separate books or on whiteboards if this helps them to focus and achieve to their potential in lesson.

During lesson we always promote ‘speaking like a mathematician’ and wherever possible explain the meaning and routes of words so as to assist pupils with their understanding. In addition, pupils sometimes take the lead with these discussions when we provide opportunities to prove something to be true, or when highlighting misconceptions. All pupils are encouraged to ask for support where needed and when this is being offered we try to re-read the questions so as to un-pick exactly what form the answer will take and possible steps to attempt on route to the answer. On larger, more functional styles of question, we encourage pupils to read one sentence at a time and if they can complete a ‘sum’ they should do so before moving on. This does help our pupils to gain marks for their workings, as opposed to reading a larger piece of text and becoming lost on how to reach the end goal because they cannot even begin to answer the bigger question.

Despite the high level of needs of most of our cohort, pupils at Park School consistently manage to progress well on their mathematics journey. We baseline pupils over a 4-6 week period, from when they arrive and use this as a robust starting baseline from which we try to improve their mathematics level. The baseline procedure includes some formative assessments using Pearson Steps, teacher observations of the work they complete according to the scheme of work, and the level of functional mathematics they are capable of completing in exam conditions. A barrier to pupil progress is often attendance, and we attempt to overcome this using our outreach programme. This involves a member of staff seeing the pupil in their home and giving/ receiving work based on their ability. However, progress here can be limited as they miss out on the quality of teaching provided in our centre.

Many of our pupils, irrespective of whether they return to their host school or not, will not have the capacity to sit GCSE examinations and therefore we feel it important that all pupils are given the opportunity to receive some form of award in Mathematics. Therefore, we aim to get all pupils a ‘qualification’ in mathematics be this Entry Level 1, 2 or 3, or Functional Skills Level 1 or 2. We facilitate this work in their personalised learning lesson they have each week, and enter them under exam conditions when the time is right.

The Bolton Impact Trust Maths Curriculum Intent– KS3

Key Stage 3 Overview					
Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Number properties and calculations	Measures	Factors and multiples	Probability	Expressions, functions and formulae	Algebraic and real-life graphs
Analysing and displaying data	Measuring and shapes 2D	Fractions, decimals and percentages	Angles and lines	Basic Equations	Graphs
Sequences	Shapes and measures in 3D	Multiplicative reasoning- Ratio	Polygons	Algebraic and geometric formulae	Transformations

We have revised the maths curriculum for key stage 3 in order to make it accessible to pupils who arrive throughout the year and remain with us on a short term basis. We have spread it across 6 half-terms to cover all of the key component knowledge of the key stage 3 mathematics curriculum. The different topics are logically sequenced so that knowledge is built upon knowledge throughout the term with pupils moving through the BIT levels as their knowledge and understanding deepens.

Pupils with us for more than one academic year will begin to revisit units in their 4th term, but will complete the unit at the next stage on from the one that they got to in their previous year. For example, a pupil may work through BIT levels 2 and 3 in Autumn 1 in their first year with us. In their second year with us, they will begin the Autumn 1 term working at BIT level 4.

An example of how topics are sequenced to move through the BIT levels as knowledge and understanding deepens- Pupils acquire declarative knowledge in the early stages and move onto the more complex procedural and conditional knowledge as they work through the small steps.

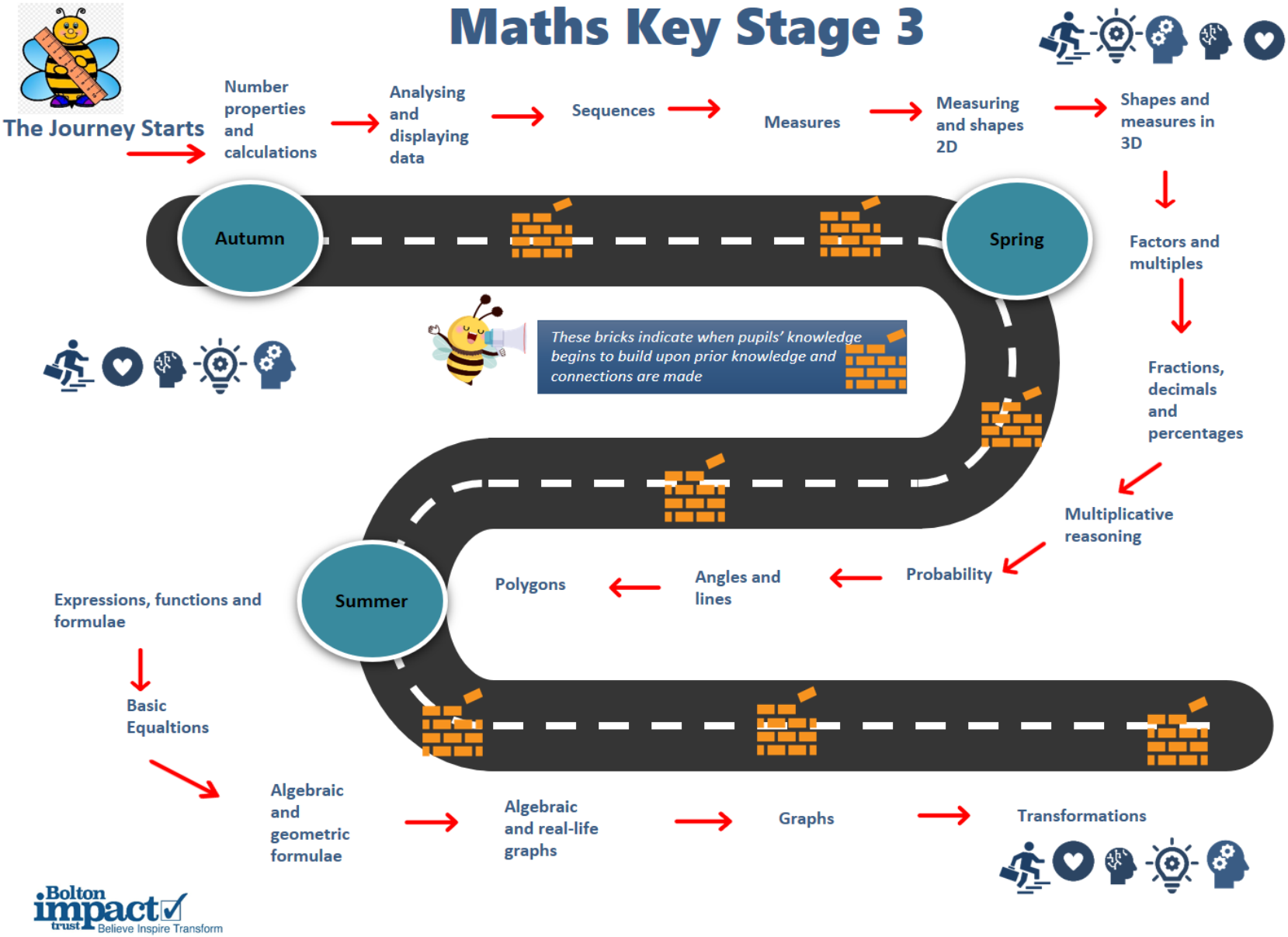
Ratio and Proportion	BIT Levels
Recognise differences in quantity and size	Pre 2
Multiply whole numbers up to 12's	Pre 4
Divide 1 and 2 digit numbers by single digits	Pre 4
Divide amounts equally into boxes	Pre 4
Simplify ratios	1
Convert fractions to ratio	1
Solve simple problems involving direct proportion	1
Write and interpret a ratio given a diagram or context	2
Compare products using basic best buy principles	2
Solve ratio problems using recipes	2
Simplify ratios with different units	2
Convert between miles and km	3
Convert between currencies when conversions are given	3
Express a number as a percentage of another	3
Divide an amount into given ratios	3
Solve problems by comparing 2 or more ratios	4
Calculate linear scale factors of similar shapes	4
Calculate missing dimensions of similar shapes	5
Interpret and solve best buy deals	5
Write, simplify and divide a ratio given complex situations	5
Convert between currencies to solve problems	5

Declarative
Procedural
Conditional

For pupils who are not working at age-related expectations we will work hard to move them through the BIT levels to bring them closer to their age-related stage. There is no limit to how quickly pupils move through the levels, although it is important that pupils achieve a deep understanding of each stage of the mathematics curriculum and are not rushed through it. As the guidance from the National Centre for Excellence in the Teaching of Mathematics states – *'A fundamental principle of teaching effectively in mathematics is that key ideas need to be understood deeply before moving on. A curriculum which encourages teachers to move on to the next topic too quickly, before key ideas are deeply understood, results in superficial learning.'*

Pupils can be grouped according to the BIT levels they are working at, but there is also the flexibility of being able to teach all or several of the levels in one key stage group using adaptive teaching. We also ensure that there is time set aside each week for targeted and individualised intervention work to help pupils who need specific support to understand some of the fundamental maths knowledge that they may have either missed in their mainstream schooling or failed to understand.

Key Stage 3 Curriculum Map



The Bolton Impact Trust Maths Curriculum Intent – KS4

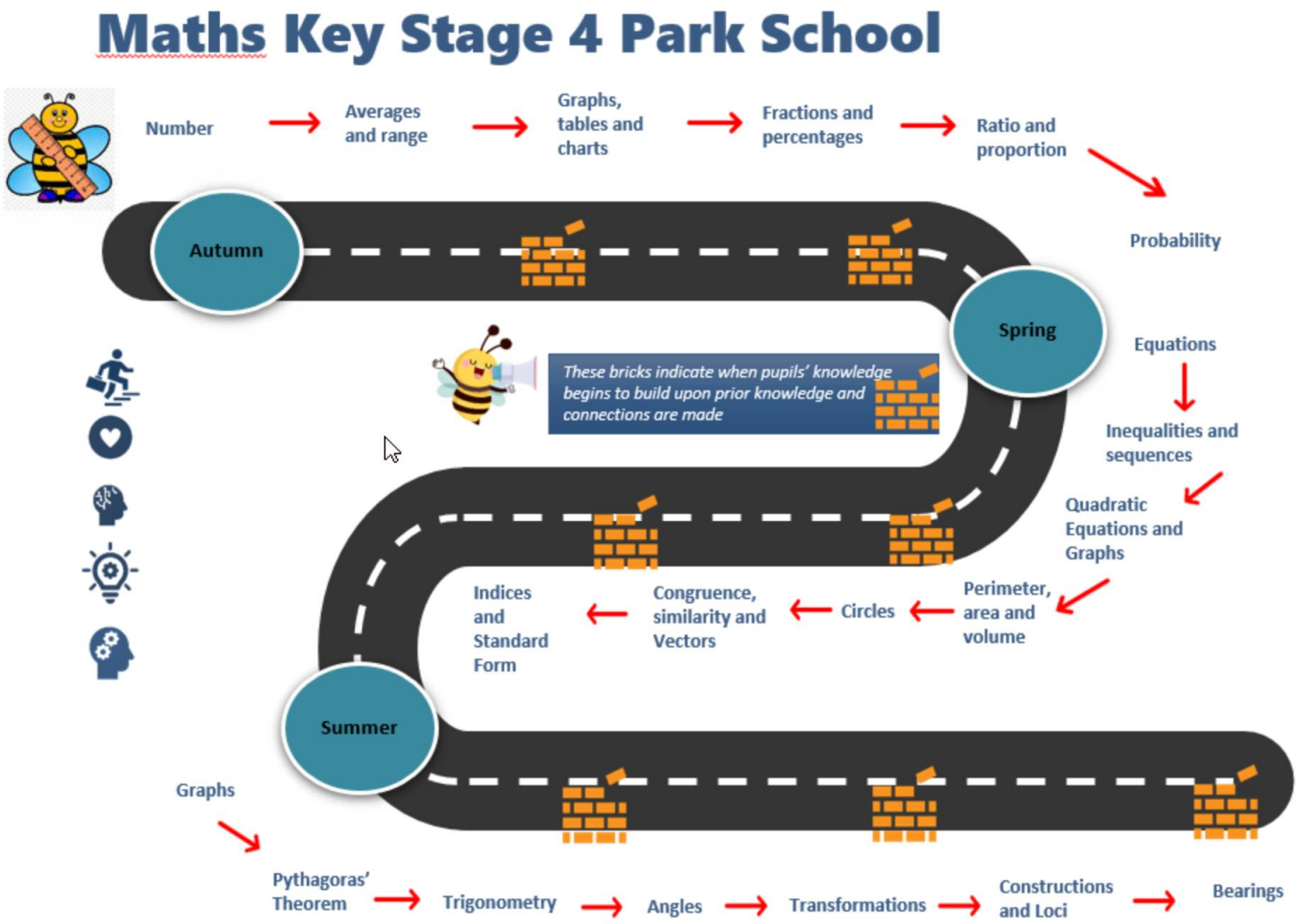
Key Stage 4 The key stage 4 curriculum continues to build upon the knowledge and skills that were delivered at key stage 3 in order for pupils to deepen their understanding, to master the fundamentals and to prepare for their formal examinations.

We have taken the same approach with the key stage 4 curriculum as we have for key stage 3. We have condensed the curriculum into a one year cycle, which means that pupils will access all of the key component knowledge that we have set out for key stage 4 over 6 half terms. This is to ensure that our key stage 4 pupils who may join us at any time during their key stage phase have every opportunity to access the full breadth of the Maths curriculum and learn the key component knowledge that we have identified as being important for them to know and to understand.

For every topic, pupils will access the key knowledge and skills within that topic on a scale which matches their ability. They will be led through the scale deepening their knowledge and building upon previous knowledge that they have acquired. If they remain with us for more than a year, they will revisit each unit of work, picking up where they left off and deepening their knowledge and skills further. The way in which we have sequenced the units over the half terms is carefully planned to ensure that knowledge and skills build through the units, but also across the units as the pupils remain with us. Within the mid-term plans there are explicitly planned opportunities for revisiting key component knowledge and skills from previous units of work and making explicit links for pupils on how this knowledge informs the new component knowledge that they are learning.

At key stage 4 we continue to include a one hour session each week of personalised mathematics intervention to address particular areas of misunderstanding and gaps in knowledge for all of our pupils to ensure that they are not prevented from making progress.

Key Stage 4 Curriculum Overview						
Key Stage 4	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Number	Fractions and percentages	Equations	Perimeter, area and volume	Graphs	Angles
	Averages and range	Ratio and proportion	Inequalities	Circles	Pythagoras Theorem	Constructions and Loci
	Graphs, tables and charts	Probability	Sequences	Congruence, similarity and vectors	Trigonometry	Bearings
			Quadratic equations and graphs	Indices and standard form	Transformations	


Maths Key Stage 4 Park School
Number
Averages and range
Graphs, tables and charts
Fractions and percentages
Ratio and proportion
Probability
Autumn
Spring
Equations
Inequalities and sequences
Quadratic Equations and Graphs
Perimeter, area and volume
Circles
Congruence, similarity and Vectors
Indices and Standard Form
These bricks indicate when pupils' knowledge begins to build upon prior knowledge and connections are made
Summer
Graphs
Pythagoras' Theorem
Trigonometry
Angles
Transformations
Constructions and Loci
Bearings

Assessment and Progress in Maths

For every topic, the mid-term plans set out the new knowledge and skills that pupils should acquire. During the term teachers use a range of formative and summative assessments to systematically check pupils' understanding and to establish what new knowledge and skills they have acquired. Every term teachers are asked to record any formative or summative assessments against the key knowledge objectives on the Insight system for the units of work that they have delivered. At the end of the term teachers are asked to use this assessment data to attribute a BIT level to each pupil.

The BIT levels range from Pre GCSE levels to GCSE grade 9. The grade descriptors are aligned with GCSE grades, Functional Skills levels and Pearson Steps. Progress is reported in these levels each term. These levels are moderated both by the Maths subject leads, SLT and the Trust's Central Team.

BIT Level Descriptors for Maths

Level	Descriptor					
	Number	**Algebra**	**Ratio and Proportion**	**Geometry**	**Statistics**	**Probability**
9	To achieve grade 9, students' evidence will show that they have securely met all the statements within the grade 9 descriptor, with stronger performance in most or all aspects of the grade 8 statements.					
	Number	**Algebra**	**Ratio and Proportion**	**Geometry**	**Statistics**	**Probability**
8a	To achieve this level students will be able to demonstrate all of the skills listed in 8b in all aspects of their work					
8b	Solve and Calculate the value of complex indices including surds	Calculate the nth term of a quadratic sequence	Set up, solve and interpret the answers in growth and decay problems	Sketch quadratic functions; identifying y and x-axis intercepts and turning points		Use a Venn diagram to calculate conditional probability
	Use and understand rational and irrational numbers	Solve simultaneous equations with one linear and one quadratic function		Use the Sine and Cosine rule in 3 dimensions		

		Calculate the gradient of the radius given the equation and centre of a circle		Prove all circle theorems algebraically		
		Calculate the acceleration and distance from Velocity-Time graphs		Use and apply Vectors to prove lines are collinear and parallel		
		Simplify and solve algebraic fractions				
8c	To achieve this level students will demonstrate that they meet the criteria for level 7a, but for some of their work they are beginning to be able to demonstrate some of the skills in 8b					
	Number	**Algebra**	**Ratio and Proportion**	**Geometry**	**Statistics**	**Probability**
7a	To achieve this level students will be able to demonstrate all of the skills listed in 7b in all aspects of their work					
7b	Evaluate numbers with positive, fractional and negative indices	Rearrange Formulae with same variable on both sides	Solve problems involving inverse and direct proportion including squares, square roots	Identify Trigonometric Graphs	Construct and Interpret histograms	Understand selection with or without replacement - And / Or Probability Questions
	Rationalise simple fractio in the denominator e.g. $\frac{3}{\sqrt{3}}$	Solve Quadratics using the formula, factorising and including completing the square	Plot and interpret Exponential Functions ($y=k^x$) for positive values of k	Use and apply Pythagoras in 3D situations	Use moving averages to identify seasonality and trends in time series data and use them to make predictions	Use a tree diagram to calculate conditional probability
	Write the denominator in terms of its prime factors, determine whether a fraction can be expressed as a recurring or terminating decimal.	Recognise the difference of two squares	Use similarity in length, area and volume to calculate scale factors and vice versa	Use and apply both Sine and Cosine rule to triangles and apply to bearing questions		
	Calculate limits using upper and lower bounds	Plot and find the equation of a circle		Enlarge a shape given a negative fractional scale factor		
		Calculate the equation of a line given two points and the		Use and apply all circle theorem's		

		equations of a perpendicular line				
		Solve inequalities algebraically and graphically		Use graphs to solve problems involving distance, speed and acceleration		
7c	To achieve this level students will demonstrate that they meet the criteria for level 6a, but for some of their work they are beginning to be able to demonstrate some of the skills in 7b					
	Number	**Algebra**	**Ratio and Proportion**	**Geometry**	**Statistics**	**Probability**
6a	To achieve this level students will be able to demonstrate all of the skills listed in 6b in all aspects of their work					
6b	Recall index factors such as n0, fractional powers	Use Iterative processes to generate sequences	Calculate reverse and compound percentage	Enlarge a shape given a negative integer scale factor	Plot and interpret cumulative frequency graphs	Calculate the outcomes of two or more events by using the product rule
	Understand the definition and multiply surds. E.g.: $\sqrt{16} \times \sqrt{4} = 8$	Use Iterative methods to calculate solutions.	Construct and solve equations involving direct proportion.	Describe fully a single transformation	Plot and interpret boxplots	Calculate a missing probability from a list or two-way table, including algebraic terms;
	Simplify surds into their simplest form. E.g.: $\sqrt{12} = 2\sqrt{3}$	Multiply three binomials E.g.: (x+5)(x+2)(x-3)	Use kinematics formula to calculate speed and acceleration from worded and graphical situations	Calculate and solve vector problems involving ratio	Plot a time-series graph	Use a two-way table to calculate conditional probability
	Convert a fraction to a recurring decimal and vice versa	Solve simple quadratics graphically and by factorising		Calculate interior and exterior angles of polygons	Construct and interpret tables and calculate averages from continuous data	
	Perform all four operations with fractions and mixed numbers	Solve and simplify algebraic fractions				
		Construct and solve simultaneous equations (both linear)				

6c	To achieve this level students will demonstrate that they meet the criteria for level 5a, but for some of their work they are beginning to be able to demonstrate some of the skills in 6b					
	Number	**Algebra**	**Ratio and Proportion**	**Geometry**	**Statistics**	**Probability**
5a	To achieve this level students will be able to demonstrate all of the skills listed in 5b in all aspects of their work					
5b	Use index notation including the use of negative integer powers	Construct and solve linear inequalities	Calculate missing dimensions in similar shapes	Calculate the area and arc length of a sector	Construct and interpret pie charts	Write probabilities using fractions, percentages or decimals
	Calculate the LCM and HCF of a number when given the prime factorisation of each number	Expand and factorise single and double brackets including difference of two squares	Calculate compound interest and depreciation after 2-5 years	Calculate the length of a line given two coordinates	Construct and interpret composite bar charts	Use tree diagrams to calculate the probabilities of two dependant events
	Calculate the upper and lower bounds of a number to a given degree of accuracy.	Substitute fractional and negative values into expressions	Write, simplify and divide a ratio given situations	Define a geometric progression and continue a sequence	Display data with an appropriate graph	Understand and use experimental and theoretical probability to calculate estimated outcomes
	Use upper and lower bounds in adding and subtracting calculations	Rearrange formulae and use to solve problems	Convert between currencies	Use and apply trigonometry to right-angled triangles including worded problems	Construct and interpret real-life graphs (including speed/distance/velocity graphs)	Work out probabilities from Venn diagrams to represent real-life situations and also ‘abstract’ sets of numbers/values
	Estimate answers to calculations with the use of rounding numbers		Interpret and solve best buy deals	Calculate volumes of 3D shapes and prisms		

	Multiply & divide integers and decimals by a number between 0-1			Transform shapes by reflecting, rotating, enlarging and translating (vectors)		
5c	To achieve this level students will demonstrate that they meet the criteria for level 4a, but for some of their work they are beginning to be able to demonstrate some of the skills in 5b					
	Number	**Algebra**	**Ratio and Proportion**	**Geometry**	**Statistics**	**Probability**
4a	To achieve this level students will be able to demonstrate all of the skills listed in 4b in all aspects of their work					
4b	Round decimals to any given accuracy	Expand and simplify brackets including with negatives e.g.: 3(x+4) - (x+5)	Calculate density, mass, volume, speed, time and distance	Construct triangles accurately given SSS, ASA, SAS	Apply and work out the fraction of each sector on a pie chart	
	Recall from memory the cubes of 1,2,3,4,5 & 10	Construct, use and rearrange simple formulae	Calculate linear scale factor of similar shapes	Construct perpendicular lines	Draw and interpret Distance-Time graphs	
	Add, subtract, multiply & divide numbers that are written in standard form	Plot and solve inequalities on a number line	Compare two ratios	Enlarge any shape given a positive scale factor	Calculate averages from frequency tables	
	Divide any integer by a decimal by converting to division by an integer e.g.: 6 ÷ 0.2 = 60 ÷ 2	Solve simultaneous equations graphically		Calculate missing lengths using Pythagoras Theorem		
	Add, subtract, multiply and divide fractions; including different denominators	Add and subtract simple algebraic fractions		Calculate interior, exterior and sum of angles in polygons		

	Convert simple fractions into recurring decimals using bus-stop method					
	Calculate percentage increase and decrease					
	Calculate simple interest					
4c	To achieve this level students will demonstrate that they meet the criteria for level 3a, but for some of their work they are beginning to be able to demonstrate some of the skills in 4b					
	Number	**Algebra**	**Ratio and Proportion**	**Geometry**	**Statistics**	**Probability**
3a	To achieve this level students will be able to demonstrate all of the skills listed in 3b in all aspects of their work					
3b	Round decimals to one and two decimals places	Expand, factorise and simplify a single bracket	Convert between miles to kilometres	Calculate the volume of a prism and cuboid.	Draw and interpret scatter graphs including line of best fit	Add simple probabilities
	Multiply and divide decimals	Substitute positive and negative integers into expressions and formulae	Convert between imperial units and currencies when conversions are given	Calculate the surface area of prism	Calculate the modal class from grouped data	Estimate the number of times an event will occur
	Be able to use positive and negative square roots, cube and cube roots	Calculate the nth term	Share an amount in a given ratio	Identify and name parts of circle	Plan and construct two-way tables	Interpret results of an experiment using the language of probability
	Add and subtract fractions by converting one fraction	Calculate the midpoint of a line on a coordinate grid and give the coordinate	Express a number as a percentage of another	Calculate the circumference and area of a circle		Know and work out the probability of an event not occurring is $1 - p$
	Order decimals, including those which have a differing number of decimal places	Solve problems involving shapes on coordinate grid		Calculate angles in Isosceles and Equilateral triangles		

	Calculate percentages of amounts using multipliers			Describe Rotations, Translations and Reflections		
	Increase and decrease an amount by a given percentage					
	Solve reverse percentage problems					
3c	To achieve this level students will demonstrate that they meet the criteria for level 2a, but for some of their work they are beginning to be able to demonstrate some of the skills in 3b					
	Number	**Algebra**	**Ratio and Proportion**	**Geometry**	**Statistics**	**Probability**
2a	To achieve this level students will be able to demonstrate all of the skills listed in 2b in all aspects of their work					
2b	Order, add and subtract positive and negative integers within contexts	Plot coordinates in all four quadrants	Convert between metric units	Identify and calculate angles on a straight line, around a point and vertically opposite	Draw and interpret frequency diagrams for discrete and continuous data	Understand and use the probability scale from 0 to 1
	List and simplify equivalent fractions	Simplify linear expressions	Write and interpret a ratio given a diagram or context	Measure and draw angles to nearest degree	Calculate the mode, median, mean and range from sets of data	List all outcomes using dice, spinners and coins
	Round decimals to the nearest integer	Multiply terms including single brackets by a positive integer	Compare products to work out best buy using simple proportions	Calculate missing angles in triangles and quadrilaterals	Draw and interpret line graphs	
	Multiply & divide any integer or decimal by powers of 10	Calculate a term-to-term rule and continue a sequence	Calculate speed, distance and time given situations	Identify properties of 3D shapes		
	Add and subtract decimals, including those with differing number of decimal places	Generate sequences from patterns]	Solve ratio problems involving recipes	Identify and construct nets of common 3D shapes		

	Use written methods to multiply & divide up to three-digit numbers by a two-digit number	Calculate the input and output of function machines (positive integers only)		Reflect, translate and rotate a shape		
	Convert between fractions, decimals and percentages			Calculate the area and perimeter of rectangles/squares/triangles		
	Express one number as a fraction of another and simplify			Calculate area and perimeter of compound shapes involving rectangles		
	Calculate percentages of amounts					
2c	To achieve this level students will demonstrate that they meet the criteria for level 1a, but for some of their work they are beginning to be able to demonstrate some of the skills in 2b					
	Number	**Algebra**	**Ratio and Proportion**	**Geometry**	**Statistics**	**Probability**
1a	To achieve this level students will be able to demonstrate all of the skills listed in 1b in all aspects of their work					
1b	Read, write and order integers, up to and including 4 digit numbers	Write and plot coordinates in the positive quadrant	Convert fractions to a ratio	Know the names and definitions of regular polygons up to decagon	Collect discrete data and record results using a frequency table	Discuss events using words such as likely, unlikely, certain and impossible
	Use mental methods to add and subtract positive and negative integers	Multiply, divide, add and subtract basic algebra	Write ratios in their simplest form	Name the different angles, acute, obtuse, right-angle and reflex	Draw a bar chart for discrete data	Place the probability of events on a scale from impossible to certain
	Use written methods to multiply & divide up to 3-digit numbers by a single-digit number		Solve simple problems involving direct proportion	Understand the properties of different quadrilaterals and triangles	Use the mode and range to describe sets of data	Find probabilities based on equally likely outcomes in simple contexts
	Multiply and divide whole numbers by powers of 10			Understand the definition of line symmetry and rotational symmetry	Read information and work out totals from a pictogram	
	Know the definition of a prime number and be able to list the first 10 prime numbers					

	Know the definition of multiples and factors and to be able to list them					
	Round whole numbers to the nearest 10, 100 and 1000					
	Use diagrams to find equivalent fractions and to make comparisons					
	Convert simple fractions into decimals, such as tenths and hundredths					
1c	To achieve this level students will demonstrate that they meet the criteria for level Pre GCSE 5 but for some of their work they are beginning to be able to demonstrate some of the skills in 1b					
	Number		**Ratio, Proportion and Measurement**	**Geometry**	**Statistics**	**Problem solving skills**
Pre GCSE 5	To achieve this level students will be able to demonstrate all of the skills listed in Pre-GCSE 5, in all of their work.					
	Count, read, write, order and compare numbers up to 1000		Calculate with money using decimal notation and express money correctly in writing in pounds and pence	Sort 2-D and 3-D shapes using properties including lines of symmetry, length, right angles, angles including in rectangles and triangles	Extract information from lists, tables, diagrams and charts and create frequency tables	Recognise, understand and use simple mathematical terms appropriate to Entry Level
	Add and subtract using three-digit whole numbers		Round amounts of money to the nearest £1 or 10p	Use appropriate positional vocabulary to describe position and direction including eight compass points and including full/half/quarter turns	Interpret information, to make comparisons and record changes, from different formats including bar charts and simple line graphs	Use the methods given above to produce, check and present results that make sense to an appropriate level of accuracy

	Divide three-digit whole numbers by single and double digit whole numbers and express remainders	Read, measure and record time using am and pm		Organise and represent information in appropriate ways including tables, diagrams, simple line graphs and bar charts	Present results with appropriate and reasoned explanation using numbers, measures, simple diagrams, charts and symbols
	Multiply two-digit whole numbers by single and double digit whole numbers	Read time from analogue and 24 hour digital clocks in hours and minutes		Use given mathematical information including numbers, symbols, simple diagrams and charts	
	Approximate by rounding numbers less than 1000 to the nearest 10 or 100 and use this rounded answer to check results	Use and compare measures of length, capacity, weight and temperature using metric or imperial units to the nearest labelled or unlabelled division			
	Recognise and continue linear sequences of numbers up to 100	Compare metric measures of length including millimetres, centimetres, metres and kilometres			
	Read, write and understand thirds, quarters, fifths and tenths including equivalent forms	Compare measures of weight including grams and kilograms			
	Read, write and use decimals up to two decimal places	Compare measures of capacity including millilitres and litres			
	Recognise and continue sequences that involve decimals	Use a suitable instrument to measure mass and length			
	To achieve this level students will demonstrate that they meet the criteria for Pre GCSE 4 but for some of their work they are beginning to be able to demonstrate some of the skills in PreGCSE 5b				
Pre GCSE 4	**Number**	**Ratio, Proportion and Measurement**	**Geometry**	**Statistics**	**Problem solving skills**
	To achieve this level students will be able to demonstrate all of the skills listed in Pre-GCSE 4, in all of their work.				

	Count reliably up to 100 items	Know the number of hours in a day and weeks in a year. Be able to name and sequence	Recognise and name 2-D and 3-D shapes including pentagons, hexagons, cylinders, cuboids, pyramids and spheres	Extract information from lists, tables, diagrams and bar charts	Use given mathematical information including numbers, symbols, simple diagrams and charts
	Read, write, order and compare numbers up to 200	Calculate money with pence up to one pound and in whole pounds of multiple items and write with the correct symbols (£ or p)	Describe the properties of common 2-D and 3-D shapes including numbers of sides, corners, edges, faces, angles and base	Make numerical comparisons from bar charts	Recognise, understand and use simple mathematical terms
	Recognise and sequence odd and even numbers up to 100	Read and record time in common date formats, and read time displayed on analogue clocks in hours, half hours and quarter hours.	Use appropriate positional vocabulary to describe position and direction including between, inside, outside, middle, below, on top, forwards and backwards	Sort and classify objects using two criteria	Use the methods given above to produce, check and present results that make sense
	Recognise and interpret the symbols +, – , x, ÷ and = appropriately	Use metric measures of length including millimetres, centimetres, metres and kilometres		Take information from one format and represent the information in another format including use of bar charts	Present appropriate explanations using numbers, measures, simple diagrams, simple charts and symbols
	Add and subtract two-digit numbers	Use measures of weight including grams and kilograms		Use the knowledge and skills listed above to recognise a simple problem and obtain a solution.	
	Multiply whole numbers in the range 0x0 to 12x12 (times tables)	Use measures of capacity including millilitres and litres			
	Divide two-digit whole numbers by single-digit whole numbers and express remainders	Read and compare positive temperatures			
	Approximate by rounding to the nearest 10, and use this rounded answer to check results	Read and use simple scales to the nearest labelled division			
	Recognise simple fractions (halves, quarters and tenths) of whole numbers and shapes	Understand hours from a 24-hour digital clock			

	Read, write and use decimals to one decimal place				
	To achieve this level students will demonstrate that they meet the criteria for Pre GCSE 3 but for some of their work they are beginning to be able to demonstrate some of the skills in PreGCSE 4b				
Pre GCSE 3	**Number**	**Ratio, Proportion and Measurement**	**Geometry**	**Statistics**	**Problem solving skills**
	To achieve this level students will be able to demonstrate all of the skills listed in Pre-GCSE 3, in all of their work.				
	Read, write, order and compare numbers up to 20	Recognise coins and notes and write them in numbers with the correct symbols (£ & p), where these involve numbers up to 20	Identify and recognise common 2-D and 3-D shapes including circle, cube, rectangle (incl. square) and triangle	Sort and classify objects using a single criterion	Use the knowledge and skills listed above to recognise a simple mathematical problem and obtain a solution
	Use whole numbers to count up to 20 items including zero	Read 12 hour digital and analogue clocks in hours	Use every day positional vocabulary to describe position and direction including left, right, in front, behind, under and above	Read and draw simple charts and diagrams including a tally chart, block diagram/graph	Address individual problems each of which draw upon knowledge and/or skills from one mathematical content area
	Add numbers which total up to 20, and subtract numbers from numbers up to 20	Know the number of days in a week, months, and seasons in a year. Be able to name and sequence	Read numerical information from lists		Use given mathematical information and recognise and use simple mathematical terms
	Recognise and interpret the symbols +, – and = appropriately	Describe and make comparisons in words between measures of items including size, length, width, height, weight and capacity			Use the methods given above to produce, check and present results that make sense and provide a simple explanation for those results.
	To achieve this level students will demonstrate that they meet the criteria for Pre GCSE 2 but for some of their work they are beginning to be able to demonstrate some of the skills in PreGCSE 3b				
Pre GCSE 2	**To achieve this level students will be able to demonstrate all of the skills listed in Pre-GCSE 2, in all of their work.**				
	Complete a range of classification activities using a given criterion				

	Talk about, recognise and copy simple repeating patterns and sequences
	Make simple estimates
	Join in rote counting to 10
	Recognise numerals 1-9 and relate them to sets of objects
	Recognise differences in quantity and size
	To achieve this level students will demonstrate that they meet the criteria for Pre GCSE 1 but for some of their work they are beginning to be able to demonstrate some of the skills in PreGCSE 3b
Pre GCSE 1	**To achieve this level students will be able to demonstrate all of the skills listed in Pre-GCSE 1, in all of their work.**
	Show awareness of cause and effects in familiar mathematical activities e.g. Knowing that a coin can be swapped for an item in a shop
	Show awareness of changes in shape, position or quantity
	Sort or match objects or pictures by recognising similarities
	Show an awareness of number activities and counting
	Demonstrate an understanding of one-to-one correspondence in a range of contexts
	Recognise differences in quantity and size

Maths Flight Path

In Maths, we have high expectations for our pupils and have created a flight path from which we judge the progress of our pupils each term. Once a pupil has been baselined, teachers calculate their expected progress using the flight path. Pupils who progress according to the flight path are judged as 'On track'. Those who do better are judged as working at 'Greater depth'. Those who are one sub-level behind on the flight path are judged as 'just below' and those who are further behind are judged as 'below'

Some pupils veer off the course of the flight path during their time with us for many different reasons. For those pupils who are not making expected flight path progress, we report on how many sub-levels of progress they have made in a term.