

Maths

Intent:

Year 8 Mathematics revisits topics within new contexts whilst extending and further developing mathematical thinking and skills. They will experience “mastery” alongside more traditional teaching methods to gain a deeper understanding, more confidence and competence in their mathematics. Each term is split into two halves with a common theme, each half is split into further blocks that ensure students spend enough time to get a deep understanding of the topic covered. Blocks have been designed with interleaving as a key element enabling students to revisit previous work, develop knowledge and understanding and further extend their skills. Number work is emphasized throughout the blocks alongside estimation. Calculator skills have been

Context:

Continuing to build on the mastery concepts introduced in year 7.

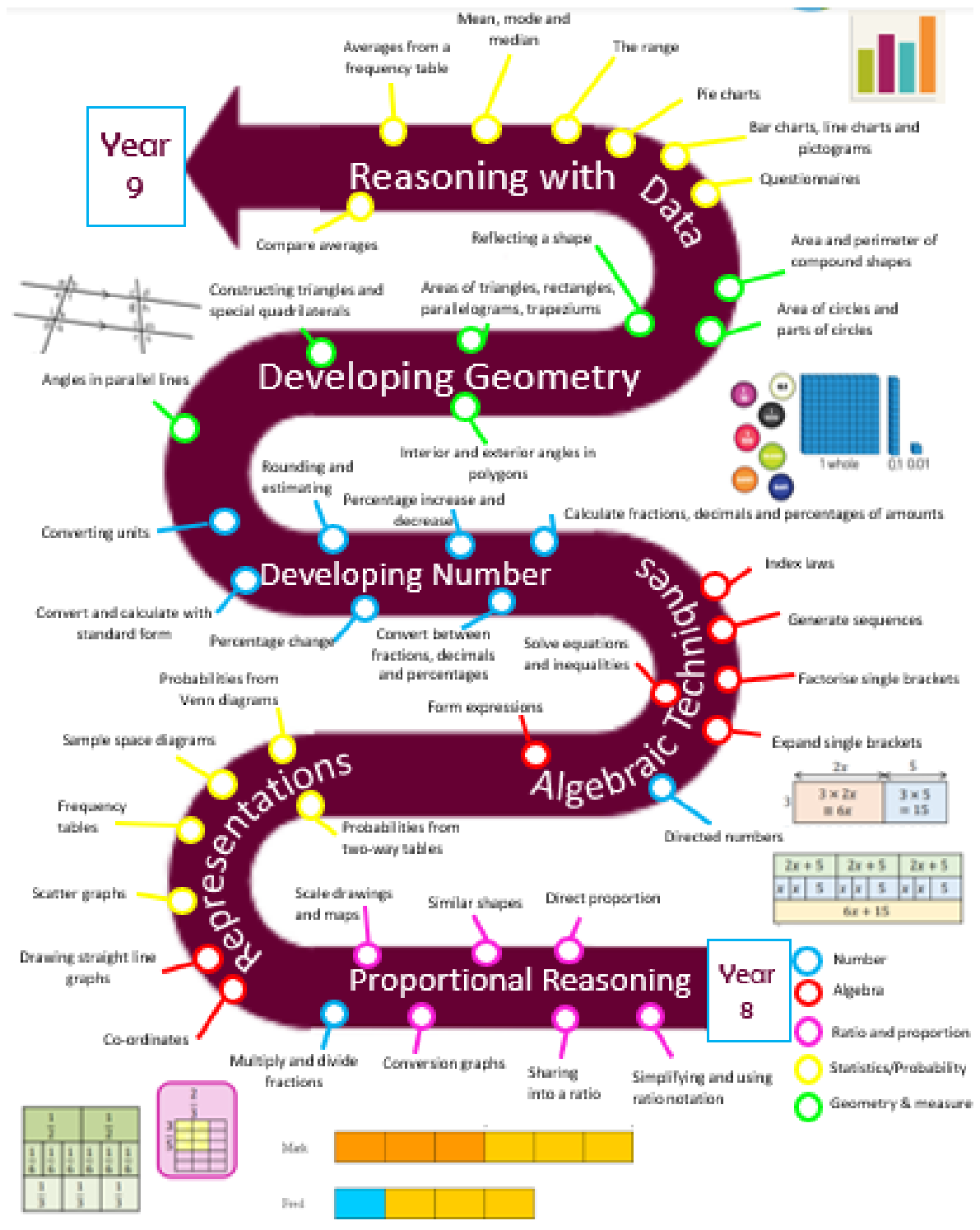
The Big Picture—Intent: Y8 Mathematics is the revisiting of topics within new contexts whilst extending and further developing mathematical thinking and skills. They will experience “mastery” alongside more traditional teaching methods to gain a deeper understanding, more confidence and competence in their mathematics. Each term is split into two halves with a common theme, each half is split into further blocks that ensure students spend enough time to get a deep understanding of the topic covered. Blocks have been designed with interleaving as a key element enabling students to revisit previous work, develop knowledge and understanding and further extend their skills. Number work is emphasized throughout the blocks alongside estimation. Calculator skills have been incorporated throughout the curriculum, thus enabling all students to access the materials presented. Any student will be able to follow the main content of all lessons with higher levels being accesses as and when a class/student requires it.

Content / Units	Skills	Knowledge	Prior—Y7	Next—Y9
<ul style="list-style-type: none"> • Proportional reasoning • Representations • Algebraic Techniques • Developing Number • Developing Geometry • Reasoning with Data 	<ul style="list-style-type: none"> • To simplify and share in ratios • To multiply and divide fractions • To plot and interpret linear graphs • To plot and interpret scatter graphs • To draw and interpret two-way tables, sample paces and Venn diagrams • To expand and factorise single brackets • To generate sequences • To use the laws of indices • To use multipliers to solve percentage problems • To convert and calculate In standard form • To calculate the areas of trapezia and circles • To reflect shapes in a line of reflection • To construct and interpret different graphs • To find the mean, median, mode and range 	<ul style="list-style-type: none"> • To know and understand ratio representation • To know how to use proportional reasoning to solve problems involving currencies, scale drawings and maps • To know how to model situations using expressions, formulae and graphs • To know how to form expressions, formulae, identities, equations and inequalities (and know the difference between these) • To know the conversions between metric units • To know and understand BIDMAS • To know how to estimate to check answers to problems • To know the rules of angles in parallel lines and in polygons • To know the formula for area of trapezia and circles • To know how to collect and represent data, and identify misleading representations 	<p>Learning in Y7 will be built upon and reinforced to improve understanding and mastery of topics.</p>	<p>Learning in Y9 will build upon the understanding and knowledge gained in Y7 and Y8, in preparation for KS4.</p>

Implementation	Marches Futures Links	Summative Assessment
<p>There will be 17 LP blocks of approx. 2 weeks each. Each lesson will involve an interleaving starter activity. Independence and study skills will be fostered through: challenging questions and problems, group and pair work, modelling, homework and PLC after each half termly assessment. Lessons will be based around multiple representations; Concrete, Pictorial, Abstract to give a deeper understanding of concepts. Reasoning will be developed through the exploration of mathematical patterns and images with a variety of problem solving methods for just one question. Learning to move forward and uncover mathematical ideas from mistakes and misconceptions via true/false, spot the mistake and other reasoning tasks where students are required to make a judgement and justify their answers. TOPs and Literacy key words will be provided for each block to enable students to recall key-words, facts, formulas and/or formal methods. WOW moments will occur when students solve complex problems, when the barrier wall disappears and they have a moment of satisfying clarity (no matter how brief) or spotting a relationship that was previously unseen. Numeracy and calculator skills will be embedded.</p>	<p>Fun Maths Roadshow to take place annually</p> <p>Continue to develop our learners understanding of numeracy and confidence working with number</p>	<p>Formal assessment will take place after each block</p> <p>Half termly assessment will take place in lieu of the final block assessment</p> <p>Hegarty Maths tasks set as homework to consolidate learning.</p> <p>Low-stakes testing as required</p> <p>Live marking will occur during lessons as required</p>

Impact:

Students will have increased understanding and confidence in Maths and be able to apply new skills to a variety of new and challenging mathematical problems. Students will know more and remember more. There will be an increase in attainment, evidenced in regular, formal and interleaved assessments.



Autumn Half Term 1 – Proportional Reasoning

Block 1 – Weeks 1 and 2	Block 2 – Weeks 3 and 4	Block 3– Weeks 5 and 6
Ratio and Scale <ul style="list-style-type: none"> Understand ratio and its link to multiplication Use ratio notation Reduce ratios to simplest form Solve ratio problems Calculate the circumference of a circle 	Multiplicative Change <ul style="list-style-type: none"> Use scale factors, linking to ratio, to solve simple direct proportion problems Convert between currencies, including using graphs Draw and interpret scale diagrams and maps 	Multiplying and dividing fractions <ul style="list-style-type: none"> Multiply and divide a fraction by an integer Multiply and divide a fraction by a fraction Understand and use the reciprocal
Notes/Links/Interleaving <ul style="list-style-type: none"> Revisit area Revisit equations Revisit converting improper fractions and mixed numbers Link to fractions of an amount 		Additional Higher Content <ul style="list-style-type: none"> Express any ratio in the form $1:n$ Explore direct proportion graphs Multiply and divide mixed numbers Multiply and divide simple algebraic fractions

Autumn Half Term 2 – Representation

Block 4 – Weeks 7 to 9	Block 5 – Weeks 10 and 11	Block 6 – Week 12
Working in the Cartesian plane <ul style="list-style-type: none"> Plot and interpret straight line graphs Understand and use the equations of a straight line, including lines parallel to the axes Make links between direct proportion and straight lines of the form $y = kx$ Model situations by translating them into expressions, formulae and graphs 	Representing data <ul style="list-style-type: none"> Draw and interpret scatter graphs Understand correlation Draw and use lines of best fit Understand grouped and ungrouped, discrete and continuous data Design and use one and two-way tables 	Probability <ul style="list-style-type: none"> List outcomes using sample space diagrams for one and two events Find probabilities using tables and Venn diagrams
Notes/Links/Interleaving <ul style="list-style-type: none"> Revisit calculation with directed number Link to solving one and two-step linear equations Revisiting Venn diagrams and set notation Links to representing data and using graphs in other areas of the curriculum 		Additional Higher Content <ul style="list-style-type: none"> Find the mid-point of a line segment Explore gradient Explore non-linear graphs Use the product rule for counting

Spring Half Term 1 – Algebraic Techniques

Block 1 – Weeks 1 to 4

Brackets, equations and inequalities

- Expand, and factorise into, single brackets
- Form and use expressions, formulae and identities
- Form and solve equations and inequalities with and without brackets
- Distinguish between equations, expressions, formulae and identities

Block 2 – Week 5

Sequences

- Generate sequences using more complex rules, e.g. with brackets and squared terms, both in words and algebraically

Block 3 – Week 6

Indices

- Form expressions using indices
- Understand and use the addition and subtraction rules

Notes/Links/Interleaving

- Revisit the use of directed number
- Solve equations set in the context of earlier contexts – shapes, angles, probability, ratio etc.

Additional Higher Content

- Expand a pair of binomials
- Solve equations and inequalities with unknowns on both sides
- Find the rule for the n^{th} term of a linear sequence
- Explore powers of powers

Spring Half Term 2 – Developing number

Block 4 – Weeks 7 and 8

Fractions and percentages

- Develop understanding of fractions, decimals and percentages
- Evaluate percentage increases and decreases
- Use multipliers to solve percentage problems
- Express one number as a percentage of another

Block 5 – Weeks 9 and 10

Standard index form

- Convert between numbers in ordinary and standard form
- Compare numbers given in standard form
- Calculate with numbers given in standard form, with and without a calculator

Block 6 – Weeks 11 and 12

Number sense

- Develop mental strategies
- Convert between metric measures and units
- Estimation, including rounding to a given number of decimal places
- Use the order of operations

Notes/Links/Interleaving

- Revisit fraction, decimal and percentage equivalence
- Revisit formal methods for calculation, for integers and fractions
- Compare and use ratios in the context of FDP

Additional Higher Content

- Finding the original given any percentage
- Understand and use surd notation
- Understand and use negative and simple fractional indices
- Convert between units of area and volume
- Use error interval notation

Summer Half Term 1 – Developing geometry		
Block 1 – Weeks 1 and 2	Block 2 – Weeks 3 and 4	Block 3– Weeks 5 and 6
Angles in parallel lines and polygons <ul style="list-style-type: none"> Review Y7 angles rules Understand and use parallel lines and angles Revisit geometric notation Work out angles in special quadrilaterals Find and use the sum of interior and exterior angles of a polygon Prove simple geometric facts 	Area of a trapezia and circles <ul style="list-style-type: none"> Review area of shapes covered in year 7 Calculate the area of a trapezium Calculate the area of a circle, and the area of parts of a circle Use significant figures Calculate the area of compound shapes 	Line symmetry and reflection <ul style="list-style-type: none"> Recognise line symmetry in polygons and other shapes Reflect shapes in horizontal, vertical and diagonal lines
Notes/Links/Interleaving <ul style="list-style-type: none"> Revisit forming and solving equations Revisit properties of shapes Revisit equations of straight lines 		Additional Higher Content <ul style="list-style-type: none"> Perform standard constructions including perpendiculars Understand and use the properties of diagonals of quadrilaterals

Summer Half Term 2 – Reasoning with data	
Block 4 – Weeks 7 to 10	Block 5 – Weeks 11 and 12
The data handling cycle <ul style="list-style-type: none"> Understand and use primary and secondary sources of data Collect data, including using questionnaires Interpret and construct statistical diagrams, including multiple bar charts Construct and interpret pie charts Compare distributions using charts Identify misleading graphs 	Measures of location and dispersion <ul style="list-style-type: none"> Revisit the median and mean, including finding the total given the mean Find the mean of grouped data Work out the mode and modal class Choose the appropriate average Comparing distributions using measures
Notes/Links/Interleaving <ul style="list-style-type: none"> Revisit finding the range Use algebraic substitution to form lists for averages and the range Links to data collection and representation in other areas of the curriculum 	Additional Higher Content <ul style="list-style-type: none"> Find unknown data values given the mean or changes in the mean Explore histograms for unequal groups Find the median from a table of values

Glossary of Key Terms:

LORIC

Interleaving

Mastery