Maths

Intent:

Year 7 Mathematics is a challenging transition to the study of secondary Mathematics. 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 2 parts with a common theme, then 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.

Context:

Most feeder primaries use the White Rose scheme of work or a hybrid of this— this feeds well into our mastery curriculum.

The Big Picture—Intent: Y7 Mathematics is a challenging transition to the study of secondary Mathematics. 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 2 parts with a common theme, then 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.
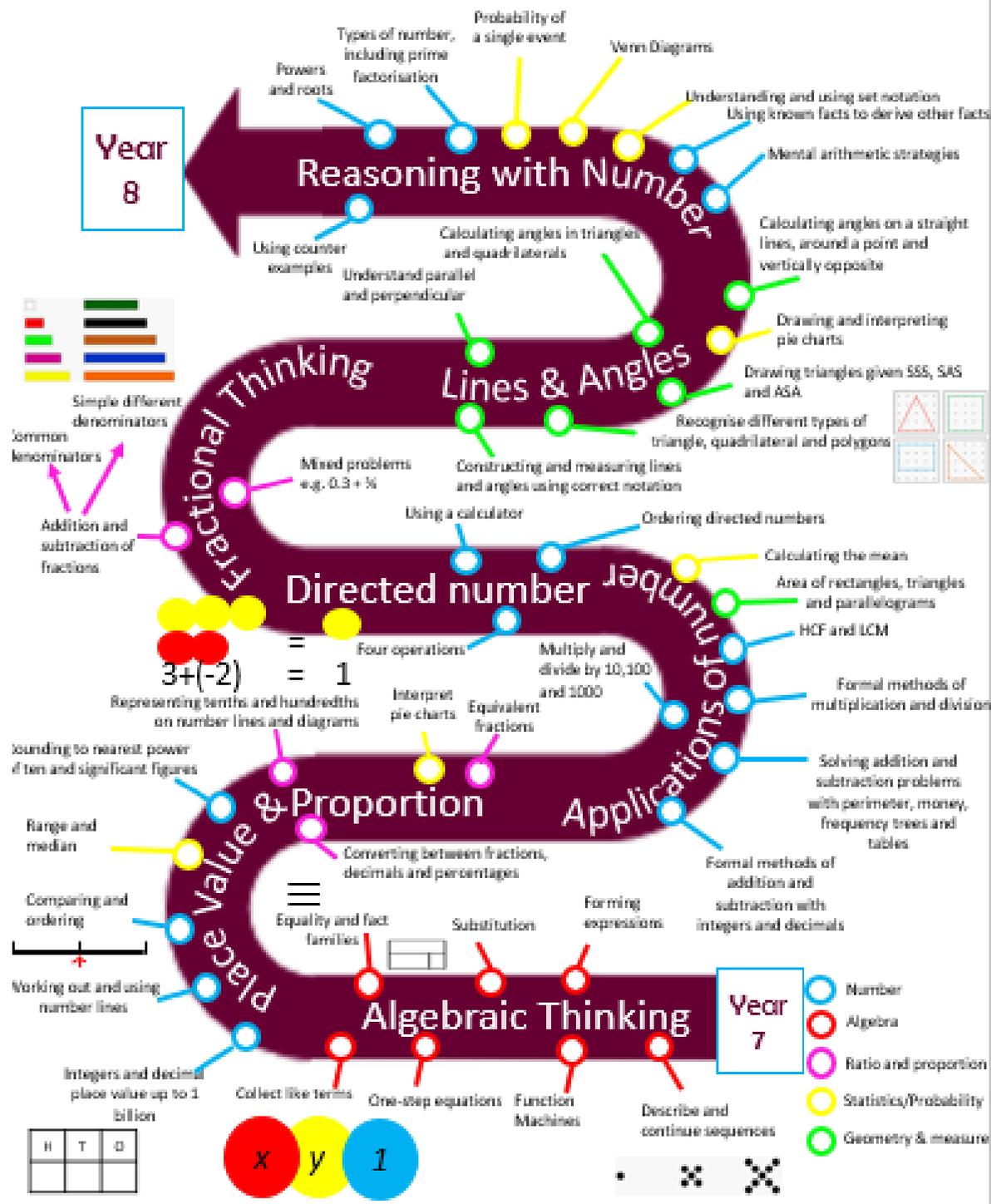
YEAR 7 MATHS

Scheme of Learning YEAR OVERVIEW

Content / Units	Skills	Knowledge	Prior—Y6	Next—Y8
• Algebraic thinking • Place value and proportion • Applications of number • Directed numbers • Fractional thinking • Lines and angles • Reasoning with number.	• To describe and continue sequences • To use function machines • To round numbers to powers of 10 • To convert between fractions, decimals and percentages • To find the mean, median and range • To use formal methods for the four operations • To calculate with directed numbers • To add and subtract fractions • To draw and measure angles • To construct triangles • To draw and interpret Venn diagrams.	• To know and understand the meanings of equality and equivalence • To know when to apply each of the four operations to problems • To know how estimation and rounding can be used to check answers • To know and understand BIDMAS • To know the meaning of factors, multiples, and primes • To know the meaning of square (and roots), cube, and triangular numbers • To know the different angle rules in straight lines, triangles and quadrilaterals • To know the meaning of probability and understand the language used • To know how to represent problems pictorially	Learning in Y6 will be built upon and reinforced to create a strong foundation of understanding.	Learning in Y8 will build upon the understanding and knowledge gained in Y7, going into more detail with previously learned topics, and applying skills to new topics.

Implementation	Marches Futures Links	Summative Assessment
There will be 15 LP blocks of approx. 2-3 weeks each. Each lesson will involve an interleaving starter. 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 keywords, 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.	Fun Maths Roadshow to take place annually Continue to develop our learners understanding of numeracy and confidence working with number	Three formal benchmarking assessments will take place every half term. Hegarty Maths tasks set as homework to consolidate learning. Low-stakes testing as required Live marking will occur during lessons as required

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.

YEAR 7 MATHS LEARNING JOURNEY

Year 8

Reasoning with Number

- Powers and roots
- Types of number, including prime factorisation
- Probability of a single event
- Venn Diagrams
- Understanding and using set notation
- Using known facts to derive other facts
- Mental arithmetic strategies
- Using counter examples
- Calculating angles in triangles and quadrilaterals
- Understand parallel and perpendicular
- Calculating angles on a straight lines, around a point and vertically opposite

Lines & Angles

- Drawing and interpreting pie charts
- Drawing triangles given SSS, SAS and ASA
- Recognise different types of triangle, quadrilateral and polygons
- Constructing and measuring lines and angles using correct notation

Fractional Thinking

- Simple different denominators
- Common denominators
- Addition and subtraction of fractions
- Mixed problems e.g. 0.3 + ½
- Using a calculator
- Ordering directed numbers

Directed number

$3+(-2) = 1$

- Four operations
- Multiply and divide by 10, 100 and 1000
- Calculating the mean
- Area of rectangles, triangles and parallelograms
- HCF and LCM
- Formal methods of multiplication and division
- Interpret pie charts
- Equivalent fractions
- Representing tenths and hundredths on number lines and diagrams
- Rounding to nearest power of ten and significant figures

Applications of number

- Solving addition and subtraction problems with perimeter, money, frequency trees and tables
- Formal methods of addition and subtraction with integers and decimals

Value & Proportion

- Range and median
- Comparing and ordering
- Converting between fractions, decimals and percentages
- Equality and fact families
- Substitution
- Forming expressions

Place Value

- Working out and using number lines
- Integers and decimal place value up to 1 billion

Algebraic Thinking

- Collect like terms
- One-step equations
- Function Machines
- Describe and continue sequences

Year 7

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Legend
- ◯ Number
- ◯ Algebra
- ◯ Ratio and proportion
- ◯ Statistics/Probability
- ◯ Geometry & measure

Autumn Half Term 1 – Algebraic Thinking

Block 1 – Weeks 1 and 2	Block 2 – Weeks 3 and 4	Block 3– Weeks 5 and 6
Exploring sequences • Describe and continue sequences in diagram and number forms, both linear and non-linear • Compare numerical and graphical forms	**Understanding and using algebraic notation** • 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

Notes/Links/Interleaving	Additional Higher Content
• Calculators should be used throughout this unit, building in teaching efficient use of calculators and informal estimation • All material is this unit is revisited and extended in forthcoming units	This introductory unit is designed to be accessed by all students – exemplification documents will illustrate tasks suitable for students of different levels of prior attainment including challenge for higher attainers.

Autumn Half Term 2 – Place Value and Proportion

Block 4 – Weeks 7 to 9	Block 5 – Weeks 10 to 12
Place value and ordering • Recognise and use integer place value up to one billion • Recognise and use decimal place value to at least hundredths • Work out intervals and use number lines • Compare and order numbers • 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	**Fraction, decimal and percentage equivalence** • Represent tenths and hundredths on diagrams and number lines • Interchange between fractions, decimals and percentages for multiples of one tenths and one quarter • Interpret pie charts • Equivalent fractions • Convert between other fractions, decimals and percentages

Notes/Links/Interleaving	Additional Higher Content
• Solve equations with fractions, including fractional coefficients • Consider sequences with fractions	• Explore and use standard index form • Explore fractions above one • Convert multiples of one eighth to decimals and percentages

Spring Half Term 1 – Application of Number

Block 1 – Weeks 1 and 2	Block 2 – Weeks 3 to 5	Block 3 – Week 6
Addition and Subtraction • Use mental and formal written methods of addition with integers and decimals, including choosing the most appropriate method • Solve problems in the context of perimeter, money and frequency trees and tables • Solve problems in the context of bar charts and line charts	**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 the 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

Notes/Links/Interleaving	Additional Higher Content
• Perimeter problems to revisit equations and simplifying • Tables to include distance charts and simple timetables • Revisit rounding • Choosing when to use mental, written or calculator methods • Order of operations to be revisited with negative numbers	• Explore addition of numbers given in standard form • Evaluate the area of a trapezium • Find the HCF and LCM of algebraic expressions • Find areas involving algebraic expressions • Use fractions greater than 1

Spring Half Term 2 – Directed Number and Fractional Thinking

Block 4 – Weeks 7 to 9	Block 5 – Weeks 10 to 12

Directed Number
• Order directed numbers, both in contextualised and abstract situations
• Revisit four operations to include directed number
• Use a calculator with directed number
• Solve two-step equations (with and without a calculator)
• Use the order of operations
	Adding and subtracting fractions
	• Represent tenths and hundredths on diagrams and number lines
	• Convert mixed numbers and improper fractions
	• Add and subtracting fractions with
	   • the same denominator
	   • one denominator a multiple of the other
	   • different denominators
	• Add and subtract fractions and decimals e.g $\frac{3}{4} + 0.2$

Notes/Links/Interleaving	Additional Higher Content
• Include inequality number lines • Revisit sequences, substitution and equations	• Negative square roots • Higher powers

Summer Half Term 1 – Lines and angles

Block 1 – Weeks 1 to 3	Block 2 – Weeks 4 to 6
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** • Calculate and use angles at a point, angles on a straight line and vertically opposite angles • Calculate missing angles in triangles and quadrilaterals
Notes/Links/Interleaving • Revisit simplifying and perimeter in e.g. polygons • Form and solve equations in geometric settings • Revisit mental and formal methods of addition and subtraction, including with decimals	**Additional Higher Content** • Understand and use parallel lines rules • Understand and use the sum of angles in any polygon • Derive simple proofs using angles rules

Summer Half Term 2 – Reasoning with number

Block 3 – Weeks 7 and 8	Block 4 – Weeks 9 and 10	Block 5 – Weeks 11 and 12
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	**Prime numbers and proof** • Recognise prime, square and triangle numbers • Express a number as a product of prime factors • Powers and roots • Make and test conjectures • Understand and use counterexamples

Notes/Links/Interleaving	Additional Higher Content
• Revisit FDP equivalence, and simple FDP addition and subtraction • Revisit factors and multiples, both numerically and algebraically	• Understand and use the complement of a set • Use prime factors to find HCFs and LCMs

Glossary of Key Terms:

LORIC

Interleaving

Mastery