CURRICULUM MAP FOR MATHEMATICS YEAR 7

HALF TERM 1:
Place Value, The Number Line and Operations

NP1: Place Value and The Number Line

- Writing integers and decimals in words and numbers.
- Ordering positive integers and decimals.
- Ordering negative integers and decimals.
- Multiplying and dividing by positive and negative powers of ten.
- Rounding: to 'the nearest', to a given number of decimal places, to a given number of significant figures.
- Common metric conversions.
- Finding the midpoint of two numbers.
- Finding the median of discrete data.
- ***Working in different bases (e.g. binary).***

NP2: Addition and Subtraction

- Mental and written strategies for addition of positive integers and decimals, including application to (worded) problems.
- Mental and written strategies for subtraction of integers and decimals, including application to (worded) problems.
- Applying addition and subtraction to problems involving the perimeter of polygons and angle facts (angles around a point and on a straight line).
- Applying addition to finding the mean & range of a discrete dataset.
- ***Working in different bases (e.g. binary).***

Opportunities for wider reading and key words:
Students will read worded problems with pronunciation corrected when necessary.

Key words:
Integers
Natural Numbers
Round
Placeholder
Significant Figures
Median

Sum
Difference
Summand
Minuend
Subtrahend
Vector
Complement
Commutative
Associative
Additive Inverse
Additive Identify
Perimeter
Path
Vertex

Opportunities for extended writing:
Students will complete a 'What a bad one looks like' known as WABOLL; an incorrectly answered question. Students are required to identify the misconceptions and provide a written explanation in their own words.

Students will mathematically reason how they have arrived at an answer for a given angle using relevant angle properties.

Speak like an expert:
Emphasis will be on using the correct terminology in correctly reading decimals; 3.21 is read as "three point two one" and **not** "three point twenty one".

Emphasis on students using the correct place value terminology when reading figures; the value of 3 in 0.831 is "3 hundreths" and **not** "0.03"

Emphasis on using correct angle properties such as "angles around a point/full turn" and **not** "angles around a circle".

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		**Homework, links to careers, personal development and other subjects:** **Homework**: Set weekly to revise key concepts covered. **Personal Development:** Reasoning skills. Working with worded problems using addition and subtraction. *E.g. Calculating and working with money.* **Careers**: Finance, Statistics, Construction. **Links to other subjects:** Business: Financial skills – calculations with money. Geography/Science: Calculating averages and measures of spread. Understanding of decimals and place value when comparing figures.
HALF TERM 2: **Number Operations and Types of Number** **<u>NP3: Multiplication and Division</u>** • Fluent recall of the multiplication tables to 12x12. • Mental and written strategies for multiplication of positive integers and decimals. • Finding multiples and the lowest common multiple by systematic listing. • Mental and written strategies for division of positive integers and decimals, Understanding division as the inverse of multiplication. • Finding factors and the highest common factor by systematic listing. • Multiplicative reasoning: getting from one number to another by multiplying rather than adding. • Applying multiplication and division to problems involving rectilinear area, the volume of cubes and cuboids, simple proportion problems and money problems. **<u>NP4: Powers, Roots and Primes</u>** • Fluent recall of squares to 15^2 and cubes to 10^3. • Evaluating powers, evaluating numerical expressions with exponents, understanding index form. • Calculating roots and understanding them as the inverses of exponents. • The addition and subtraction rules for multiplication and division of powers. • Fluent recall of prime numbers less than 100. • The Fundamental Theorem of Arithmetic.		**Opportunities for wider reading and key words:** Students will read worded problems with pronunciation corrected when necessary. **Key words:** Product Multiplier Multiplicand Commutative Associative Distributive Multiple LCM – Lowest Common Multiple Quotient Divisor Dividend Multiplicative Inverse Reciprocal Non-commutativity Non-associativity Factor HCF – Highest Common Factor Coprime Area Rectangle Square Volume Cube Cuboid Power Exponent Index Square Cube Root Surd

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		Prime HCF – Highest Common Factor
		**Opportunities for extended writing:** Students will complete a 'What a bad one looks like' known as WABOLL; an incorrectly answered question. Students are required to identify the misconceptions and provide a written explanation in their own words. Students will reason why a number is or is not a factor/multiple of another. Students will reason why a number is prime, coprime or neither.
		**Speak like an expert:** Verbal recall of times tables. Students will reason why a number is or is not a factor/multiple of another, Students will reason why a number is prime, coprime or neither using correct terminology. Emphasis on students using the correct terminology when saying powers or root; 3^4 is "three to the power 4" **not** "three four". Students will be able to read a power of 2 as squaring and a power of 3 as cubing. Students will be able to read $\sqrt{}$ as square root and similarly with cube root, fourth root etc… Units of measurement read correctly; $15m^2$ is read as "15 metres squared".
		**Homework, links to careers, personal development and other subjects:** **Homework:** Set weekly to revise key concepts covered. **Personal Development:** Working with worded problems using multiplication and division. *E.g. Calculations with multiple quantities or sharing amounts. Links to area, volume, proportion and money.* **Careers**: Construction, Finance, Photography, Computer Science, Physics. **Links to other subjects:** Science/Computer Science: Area of 2D shapes, Volume of 3D shapes. Powers linking to algorithms and scientific prefixes.

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HALF TERM 3:
Order of Operations and Directed Numbers

NP5: Order of Operations

- Order of operations with the four operations.
- Order of operations including exponents.
- Breaking the order of operations with brackets.
- Applying the order of operations to problems with integers and decimals.

NP6: Directed Numbers

- Understanding negative numbers in various contexts, including temperature and finance, and on a number line (vertical and horizontal).
- Addition with directed numbers.
- Subtraction with directed numbers.
- Multiplication and division with directed numbers.
- Powers of negative numbers.
- Using the order of operations with directed numbers and applying directed number knowledge to contextual problems.

Opportunities for wider reading and key words:
Students will read worded problems with pronunciation corrected when necessary.

Key words:
Commutative
Non-commutative

Zero Pairs
Additive Inverse

Opportunities for extended writing:
Students will complete a 'What a bad one looks like' known as WABOLL; an incorrectly answered question. Students are required to identify the misconceptions and provide a written explanation in their own words.

Speak like an expert:
Students will be able to reason why numbers are larger than or smaller than each other referring to the number line.

Students will be able to articulate the precedence of operations when calculating mulit-step problems.

Homework, links to careers, personal development and other subjects:

Homework: Set weekly to revise key concepts covered.

Personal Development: Understanding negative numbers in various contexts. *E.g. Temperature and finance.*

Careers: Finance, Engineering, Meteorology, Computer Programming.

Links to other subjects: Science/Business/ Geography: Ability to understand the value of and compare negative figures when working with temperatures or financial figures.

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HALF TERM 4:
Fractions

NP7: Fractions

- Knowing that a fraction can represent a part of a whole, or a division of two integers.
- Understanding visual and numerical representations of proper and improper fractions.
- Understanding equivalent fractions, including 'simplest form'.
- Comparing the size of fractions through common denominator or common numerator.
- Knowing the complement to 1 of a proper fraction.
- Adding and subtracting fractions.
- Finding a fraction of a number.
- Expressing one number as a fraction of another, and finding a whole given a fraction of it.
- Multiplying and dividing fractions.
- Using the order of operations with fractions and applying fraction knowledge to contextual problems.
- ***Binary fractions***

Opportunities for wider reading and key words:
Students will read worded problems with pronunciation corrected when necessary.

Key words:
Rational Numbers
Numerator
Denominator
Proper
Improper
Coprime
Complement

Opportunities for extended writing:
Students will complete a 'What a bad one looks like' known as WABOLL; an incorrectly answered question. Students are required to identify the misconceptions and provide a written explanation in their own words.

Speak like an expert:
Students will be expected to understand and use the phrase:
"Dividing is the same as multiplying by the reciprocal"

Students will be able to use correct terminology when referring to each part of a fraction such as saying "the numerator is".

Students will read fractions such as $\frac{3}{7}$ as "three sevenths" or "three over seven" or "three out of seven".

Students to understand that "fractions represent divisions". Students are able to recognise that $\frac{3}{7}$ is equivalent to "three divided by 7".

Students able to read mixed numbers such as $2\frac{3}{7}$ as "two and three sevenths".

Homework, links to careers, personal development and other subjects:

Homework: Set weekly on to revise key concepts covered.

Personal Development: Understanding and calculating discounts/reductions/increases. *E.g. A TV is reduced by $\frac{1}{4}$ of its original value.* Measuring quantities for recipes. *E.g. $\frac{1}{4}$ of a pack of butter is needed for a recipe.*

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		Understanding of statistics. E.g. $\frac{1}{3}$ of people voted for a particular party in an election. **Careers**: Catering, Construction, Nursing, Pharmacy, Measurements, Finance, Statistics. **Links to other subjects:** Science/Business/Geography: Ability to calculate, compare, convert and reason with fractions.
HALF TERM 5: **FDP Equivalence and Introduction to Algebra** **<u>NP8: Percentages, Fractions and Decimals</u>** • Knowing that a percentage is a fraction with denominator 100. • Finding equivalent fractions, decimals and percentages and ordering a mix of fractions, decimals and percentages. • Knowing the difference between, and how to write, recurring and terminating decimals. • Finding a percentage of an amount, including where the percentage is greater than 100%. • Finding the percentage of an amount using decimal multipliers. • Expressing one number as a percentage of another. • Applying knowledge of percentages to problems, including simple percentage increase and decrease and interpreting pie charts. **<u>A1: Introduction to Algebraic Thinking</u>** • Generalising number to algebra, recognising the concept of an 'unknown variable'. • Simplifying simple additive linear expressions with no more than three variables • Solving simple 'unknown value' problems, using a range of symbols, including blank boxes and letters • Substituting numbers for variables presented as a range of symbols, including blank boxes and letters		**Opportunities for wider reading and key words:** Students will read worded problems with pronunciation corrected when necessary. **Key words:** Equivalent Recurring Terminating Unknown Variable
		**Opportunities for extended writing:** Students will complete a 'What a bad one looks like' known as WABOLL; an incorrectly answered question. Students are required to identify the misconceptions and provide a written explanation in their own words. Students will be able to interpret pie charts and make/evaluate conclusions from these diagrams.
		**Speak like an expert:** Students will understand that "percent" means "out of 100". Students will understand and use the word equivalent. E.g. $\frac{1}{2}$ is equivalent to 0.5 which is also equivalent to 50%. Students will refer to as unknown as a "variable".
		**Homework, links to careers, personal development and other subjects:** **Homework**: Set weekly to revise key concepts covered. **Personal Development:** Understanding that quantities can be represented as fractions, decimals and percentages. *E.g. 50% off in a*

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		shop is equivalent to subtracting half of the original cost. **Careers**: Catering, Construction, Nursing, Pharmacy, Measurements, Finance, Computer Science, Engineering, Physics. **Links to other subjects:** Science/Business/Geography: Ability to convert and understand the equivalent value of fractions, decimals and percentages. Computer Science/Science: Understanding the concept of a variable and beginning to solve equations.
HALF TERM 6: **Manipulating and Simplifying Algebraic Expressions** **<u>A2: Manipulating and Simplifying Expressions 1</u>** • Knowing the conventions of algebraic notation, including ab for a*b, 3y for y+y+y and 3*y, a^4 for a*a*a*a, a^2b for a*a*b, a/b for division, coefficients as fractions not decimals, implied brackets. • Collecting like terms, including terms with non-unit exponents. • Simplifying indices and coefficients when multiplying and dividing, including the multiplication rule for indices (power of a power). • Creating algebraic expressions to represent various contexts.		**Opportunities for wider reading and key words:** Students will read worded problems with pronunciation corrected when necessary. **Key words:** Expression Term Coefficient Variable Constant Monomial Binomial Polynomial
		**Opportunities for extended writing:** Students will complete a 'What a bad one looks like' known as WABOLL; an incorrectly answered question. Students are required to identify the misconceptions and provide a written explanation in their own words.
		**Speak like an expert:** Emphasis on correctly reading algebraic terminology. Students will be able to read $3y$ as "three y" and "three lots of y". Students will be able to read ab as "a multipled by b" and "ab". Students will be able to read coefficients. E.g. "The coefficient of $3y$ is 3". Students will be able reason why terms are like terms or not.

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		**Homework, links to careers, personal development and other subjects:** **Homework**: Set weekly to revise key concepts covered. **Personal Development:** Logical thinking skills. Ability to represent concepts in algebraic contexts. **Careers**: Engineering, Physics, Astronomy, Electrician, Finance. **Links to other subjects:** Science/Computer Science: Understanding the foundation concepts of Algebra.