2021-22 CURRICULUM MAP FOR MATHS YEAR 7

HALF TERM 1: Number Operations & Properties and Decimals

Number Operations & Properties
- use of correct mathematical symbols (<, >, ≤, ≥, =, ≠).
- use of column addition and subtraction of integers.
- use of grid multiplication to multiply 2 large integers.
- divide an integer by an integer using short division (bus stop method).
- understand that operations have an inverse and can be used to check answers.
- use simple direct proportion to find single amounts or a multiple of an amount.
- recall, and use a calculator, to evaluate powers and roots.
- extend the number line – recap ordering negative numbers.
- complete the four operations with negative numbers.
- use of BIDMAS hierarchy of operations to complete calculations (including negative numbers).
- identify factors of a given number.
- identify multiples of a given number.
- understand HCF stands for highest common factor and can list factors of two numbers to find it.
- *reading and representing inequalities on a number line.*
- *understand LCM stands for lowest common multiple and can list multiples of two numbers to find it.*
- *understood what is meant by a prime number and can express a number as a product of its prime factors.*

Decimals
- understand our number system is base 10 and the value of digits in a place value table.
- understand the use of placeholders in decimal numbers.
- ordering decimals and be able to compare two decimals using the correct mathematical symbol.
- use the column method to add and subtract decimals.
- use a place value table to multiply and divide numbers by powers of 10.
- multiply two decimal numbers (first multiplying by powers of 10 to create an integer multiplication completed using grid method, then divide by the same power of 10).
- round a number to the nearest power of 10 using a place value table.
- round to a given number of decimal places using a place value table.
- understand what is meant by a significant figure and be able to identify them.
- round to a given number of significant figures and can use this to estimate the answer to a calculation.
- *adapt a question to form an equivalent calculation.*
- *identify methods for addition and subtraction of numbers that are not base 10 (eg the difference between two times).*
- *use a related calculation to answer to question (eg if 24 x 1.6 = 28.4 then what is 0.24 x 16?).*

Students will read worded problems – with pronunciation corrected when necessary.
Integer

<, >, ≤, ≥, =, ≠
BIDMAS (and other synonyms)
Inverse
Factors and multiples (including HCF and LCM)
Prime
Placeholder
Place value
Decimal places
Significant figures
Estimation
Equivalent

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.

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

Extended Do Now Topics
1. Use of mathematical symbols
2. Column addition nad subtraction
3. Grid multiplication
4. Bus stop division
5. Negative numbers
6. Factors and multiples
7. Calculations with decimals

HALF TERM 2: Fractions and Percentages

Fractions

- understand the term equivalent fraction and be able to find equivalent fractions (including simplifying fractions).
- understand what mixed numbers and improper fractions are and be able to convert between the two.
- use of equivalent fractions to order and compare (using correct mathematical symbols).
- multiply a fraction by an integer and calculate a fraction of an amount.
- use of equivalent fractions add and subtract fractions with common and uncommon denominators.
- divide two fractions.
- understand that a percentage is a measure per every 100 and can be written as an equivalent fraction with its denominator being 100 (including percentages greater than 100%)
- use of a place value table to find equivalent fractions for decimals (including decimals greater than 1).
- use of short division to find an equivalent decimal for a fraction (including improper and mixed numbers).
- order and compare fractions, decimals and percentages using the correct mathematical symbols.
- *add, subtract, multiply and divide mixed numbers.*

Percentages

- use of division and multiplication to find a percentage of amount without a calculator.
- use of equivalent decimals (multipliers) to find a percentage of an amount using a calculator.
- increase/decrease an amount by a given percentage.
- calculate an original amount using reverse percentages.
- calculate simple interest and see the applications in the real world.
- express one number as a percentage of another.
- use a calculator to find a percentage change.
- apply percentages knowledge to real life problems including identifying a "best buy".
- *have an appreciation for the relationships of percentages of amounts.*
- *understand the difference between simple interest and compound interest.*

Students will read worded problems – with pronunciation corrected when necessary.

Fraction (proper, improper, mixed number)
Numerator
Denominator
Equivalent
Simplify
Of
Percent/percentage
Decimal multiplier
Increase/decrease
Simple interest
Simple depreciation
Reverse (%)
Change (%)
Compound interest/depreciation

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 need to verbally explain key words and concepts. e.g. 0.4 is not equivalent to 4% because…

Extended Do Now Topics
Including HT1, topics to include a variety from:
1. Mixed numbers and improper fractions
2. Calculations with fractions
3. Understanding percentages
4. Equivalent FDP
5. Calculations with percentages

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HALF TERM 3: Probability and Ratio

Probability
- understand the probability scale (worded and numerical 0-1) and be able to place events in the correct place on the scale.
- express the probability of an event occurring as a fraction.
- understand that the probability of an impossible event occurring is 0 (and not a fraction with 0 as the numerator).
- understand what is meant by exhaustive events.
- understand, and use, that the sum of the probabilities of exhaustive events is 1.
- calculate the probability of an event not occurring.
- list outcomes of events systematically to calculate a probability.
- draw a sample space diagram to calculate a probability of an event occurring.
- *calculate the probability of two events combined.*
- *understand the difference between relative frequency and theoretical probability.*
- *calculate relative frequency.*
- *made judgements on fairness by comparing relative frequency and theoretical probability.*

Ratio
- interpret and use map scales when written as a ratio.
- use a ratio to complete scale drawings.
- understand that a ratio compares parts against each other (and not against the whole like a fraction).
- use a ratio to compare one part against the whole (proportion).
- identify equivalent rations (including simplifying ratios).
- use of equivalent ratios to find a missing amount.
- use a bar model to represent ratios visually.
- dividing an amount by a given ratio using the bar model.
- *simplifying ratios with three parts.*
- *compare parts of a ratio using the bar model.*

Students will read worded problems – with pronunciation corrected when necessary.

Probability (impossible, even chance, certain)
Event
Occurring
Exhaustive
Sample space
Bias/unbias
Relative frequency
Theoretical probability
Ratio
Proportion

Students will have the opportunity to interpret worded problems to calculate the probability of events. They will also need to practise presenting their systematic listing of outcomes in a clear, concise manner.

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 need to verbally explain key words and concepts. e.g. the probability of winning the lottery is not even chance, or $\frac{1}{2}$ because you can either win it or not win it. Context of questions will need to be discussed and understood.

Reading ratios correctly 3 : 5 is read as "3 to 5" not "3 ratio 5" or "3 dot dot 5" or "3 colon 5".

Extended Do Now Topics
Including Term 1, topics to include a variety from:
1. Probability scale
2. Calculating probabilities
3. Sample space diagrams
4. Ratio

HALF TERM 4: Measures and 2 Dimensional Shapes

Ratio (continuation from previous half term)

- compare ratios with fractions and percentages.
- *combine two ratios into one equivalent ratio.*

Measures

- convert between metric units of measurement (length, mass and capacity).
- convert between metric and imperial units of measurement.
- understand units of length, area and volume.
- read scales of measure accurately (including in real life).
- convert between digital and analogue time.
- complete calculations involving time.
- understand what acute, right, obtuse and reflex angles are and can identify each type.
- Describe a line segment (AB refers to the two end points of a line) and an angle (ABC refers to the angle at vertex B from points A and C) using letter notations.
- know how to show a right angle on a diagram.
- accurately measure angles using a protractor.
- accurately draw angles using a protractor.
- *estimate lengths, weights and the size of an angle.*
- *accurately construct triangles given two side lengths and an angle.*
- *accurately construct triangles given two angles and a side length.*
- *use a pair of compasses to construct a triangle given three side lengths.*

2 Dimensional Shapes

- recall the names of 2D shapes.
- identify the properties of 2D shapes and understand how to show this on a diagram (parallel, equal…)
- understand what is meant by the terms regular and irregular.
- identify scalene, isosceles and equilateral triangles by measuring side lengths and/or angles.
- plot cartesian coordinates in all four quadrants.
- identify lines of symmetry in 2D shapes.
- understand what perimeter is and be able to calculate the perimeter of 2D shapes.
- calculate the perimeter of 2D shapes when all lengths are given.
- calculate the perimeter of a shape when lengths are in different units.
- understand the applications of perimeter and be able to solve real life problems.
- calculate the area of squares and rectangles.
- *investigate the relationship between the circumference (perimeter) of a circle and its radius.*
- *investigate the relationship between the area of a circle and its radius.*

Students will read worded problems – with pronunciation corrected when necessary.

Metric (length, area and volume)
Imperial
Digital time
Analogue time
Angle and types of angles (acute, right, obtuse and reflex angles)
Line segment
Vertex
Construct
Polygon
Parallel
Perpendicular
Regular
Irregular
Types of triangles (scalene, isosceles and equilateral)
Quadrilateral
cartesian coordinates
quadrants
Symmetry
Perimeter
Area
Compound shape
Radius and diameter
Circumference

Students will have the opportunity to create their own worded problem(s) and written descriptions of 2D shapes using the correct mathematical language.

Correct notation when describing a line segment or an angle and identifying parallel or lines of an equal length.

Units written (and said) correctly 15m^2 is read as "15 metres squared"

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 encouraged to use the correct terminology when describing diagrams and to include the correct units, discussing the appropriateness of different units. Students will demonstrate how to correctly describe a shape using its mathematical properties for a peer to recognise it.

Extended Do Now Topics
Including HT3, topics to include a variety from:

		1. Units
		2. Properties of 2d shapes
		3. Coordinates
		4. Symmetry
		5. Perimeter
		6. Area

HALF TERM 5: Angle Properties

2 Dimensional Shapes (continued from previous half term)
- calculate the area of triangles and parallelograms.
- calculate the area of compound shapes when all lengths are given.
- *calculate the perimeter of compound shapes (including finding missing lengths).*
- *calculate the area of compound shapes (including finding missing lengths).*
- *calculate the area of a trapezium.*

Angle Properties
- describe a turn or direction using compass points.
- understand that an angle of 180° represents a straight line.
- calculate missing angles on a straight line.
- understand the terms interior and exterior angles.
- know that the sum of the interior angles of a triangle is 180°.
- calculate missing angles in a triangle.
- use properties of 2D shapes to find missing angles in special triangles.
- find an exterior angle using the property of angles on a straight line.
- know that the sum of the angles around a point is 360°.
- calculate missing angles around a point.
- understand that 3 figure bearings are a direction, always measured from North in a clockwise direction.
- calculate missing angles in quadrilaterals by recalling the properties of the shape.
- *calculate a missing exterior angle.*
- *calculate an exterior angle of a regular polygon.*
- *calculate angles in irregular quadrilaterals.*
- *investigate angles in parallel lines.*

Students will read worded problems – with pronunciation corrected when necessary.

Turn
Interior
Exterior
3 Figure bearing

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 able to give written justification of why they have arrived at an answer using angle properties.

Students will need to verbally explain key words and concepts and will be encouraged to refer to angles using letter notation.

Extended Do Now Topics
Including Term 2, topics to include a variety from:
1. Finding the area of shapes
2. Understanding angle properties
3. Calculating missing angles

HALF TERM 6: Processing and Presenting Data

Processing Data
- understand the terms discrete and continuous data and be able to give examples of both.
- calculate measure of central tendency for a list of numbers (mode, median and mean).
- comment and make judgements on the spread of a list of numbers (range and outliers).
- describe and compare distributions using appropriate measures.
- construct and interpret tally charts and frequency tables.
- identify the mode from a tally chart or frequency table.
- complete a data collection sheet.
- *calculate the mean from a frequency table of discrete data.*
- *appropriately group continuous data to complete a tally chart or frequency table.*

Presenting Data
- construct and interpret bar charts (including identifying the mode).
- construct and interpret pictograms (including identifying the mode).
- construct and interpret vertical line graphs (including identifying the mode).
- *construct and interpret pie charts.*
- *use scatter graphs to compare two variables to establish whether they have a relationship or not.*

Students will read worded problems – with pronunciation corrected when necessary.

Discrete
Continuous
Average (mode, median, mean)
Spread/consistency (range and outliers)
Distribution
Frequency
Vertical/horizontal
Axis/axes
Variables

Students will have the opportunity to complete a handling data project. Data will be collected, processed, presented and analysed. The data will be written up to explain the mathematics in context to the original data collected.

Students will need to verbally explain key words and concepts and will be compiling their own data collection sheets for the handling data project. Working in small groups to find the most efficient and effective way of doing so.

Extended Do Now Topics
Including HT5, topics to include a variety from:
1. Calculating averages
2. Tally charts
3. Frequency tables
4. Bar charts
5. Pictograms
6. Line graphs