CURRICULUM MAP FOR MATHS
YEAR 10

HALF TERM 1: Ratio and Percentages

- ***Capture recapture methods for estimating population size.***
- ***Writing a recurring decimal as an equivalent fraction in its simplest form.***

Ratio

- Convert between units of time, length, weight, *capacity,* ***area and volume*** using ratios/ratio tables.
- Write ratios for a situation, either from words or a diagram.
- Read and write using the correct notation for ratio.
- Simplify ratios and be able to identify equivalent ratios.
- Use a bar model to model ratio problems.
- Share an amount by a given ratio.
- *Find a missing amount in a ratio.*
- *Calculate missing amounts when given a comparison between parts of a ratio.*
- ***Combine ratios using LCM.***

Percentages

- Convert between equivalent percentages, decimals and fraction in their simplest form.
- Calculate a percentage of an amount without a calculator.
- Increase/decrease an amount by a given percentage without a calculator.
- Understand the use of percentage multipliers and be able to use equivalent decimals to find a percentage of an amount on a calculator.
- *Use percentage multipliers to be able to increase/decrease an amount by a given percentage.*
- *Calculate the percentage change, using inverse operations by considering a decimal multiplier.*
- *Calculate an original amount given the percentage change and the new amount (reverse percentages).*
- Calculate simple interest over a number of years.
- *Calculate compound interest and depreciation over a number of years and understand why this is different to simple interest.*
- ***Calculating the percentage increase/decrease after a repeated percentage change.***

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

Students will practise writing their answers showing full workings out and understand what they will be awarded individual marks for using a mark scheme.

In order to ease the understanding of exam questions, using correct terminology will be emphasised in lessons. Students will also be encouraged to discuss their answers with peers when relevant to develop their understanding of keywords further.

Homework – (Extended Do Now Topics)

1. Converting units
2. Ratio
3. Converting between FDP
4. Percentage calculations
5. Percentage multipliers
6. Calculating interest

CURRICULUM MAP FOR MATHS
YEAR 10

HALF TERM 2: Algebra and Graphs

Algebra

- Simplify algebraic expressions by collecting like terms, multiplying and dividing terms.
- Expand a single bracket using grid method.
- Expand two brackets using grid method.
- ***Expand three brackets and fully simplify the answer.***
- Factorise an expression into one bracket
- *Factorise an expression into 2 brackets*
- ***Complete the square for a quadratic expression that can't be factorised.***
- Substitute positive values into formulae.
- Substitute negative values into formulae.
- *Substitute values into scientific formulae (SUVAT)*
- Change the subject of a formula by balancing to maintain equality.
- *Change the subject of scientific formulae (SUVAT)*
- ***Change the subject of a formula where the subject appears twice.***
- Use function machines to find an output given its input.
- Use function machines to find an input given its output.
- *Use function machines to write an expression for the inverse of a function.*
- ***Read and use function notation including evaluating (substitution), compound and inverse functions.***
- ***Manipulate algebraic fractions.***

Graphs

- Plot co-ordinates in all four quadrants.
- Plot the graph of a linear function by completing a table of values.
- Identify which functions will create a linear graph.
- Identify the gradient and y-intercept of a linear graph from its equation.
- Identify a linear graph's y-intercept
- *Calculate the gradient of a linear graph*
- *Find the equation of a linear graph by identifying the y-intercept and calculating the gradient.*
- Understand that parallel lines have the same gradient.
- *Find the equation of a parallel line through a given point.*
- ***Calculate the gradient of a line through two given co-ordinates.***
- ***Find the equation of a line through two given co-ordinates.***
- ***Understand the relationship between the gradients of perpendicular lines.***
- ***Find the equation of a perpendicular line through a given point.***
- ***Use a tangent to estimate the gradient of a curve at any given point.***
- ***Calculate the area under a graph and be able to interpret this as distance in a velocity time graph.***

Students will read worded problems – with pronunciation corrected when necessary. Key words from KS3 to continue to be used with additions of:

Binomial
Function
Compound function
Inverse function

Students will practise writing their answers showing full workings out and understand what they will be awarded individual marks for using a mark scheme.

In order to ease the understanding of exam questions, using correct terminology will be emphasised in lessons. Students will also be encouraged to discuss their answers with peers when relevant to develop their understanding of keywords further.

Homework – (Extended Do Now Topics Including HT1, topics to include a variety from)

1. Simplifying algebra
2. Expanding brackets
3. Factorising expressions
4. Substitution
5. Rearranging
6. Linear graphs

CURRICULUM MAP FOR MATHS YEAR 10

HALF TERM 3: Pythagoras' Theorem and Trigonometry

Pythagoras' Theorem

- Understand that the hypotenuse (largest side) of a right-angled triangle is always opposite the largest angle; the right angle.
- Calculate the length of a hypotenuse in a right-angled triangle.
- Calculate the length of a shorter side of a right-angled triangle.
- *Use Pythagoras' Theorem to check if a triangle contains a right angle.*
- ***Use Pythagoras' Theorem in 3 dimensions to calculate the length of diagonals in cubes and cuboids.***

Trigonometry

- Identify the hypotenuse, opposite and adjacent sides in a right-angled triangle relative to a given angle.
- Identify which trigonometric function can be used given the sides and/or angle that has been given.
- Calculate a missing side in a right-angled triangle when given an angle and another side.
- Calculate a missing angle in a right-angled triangle when given two sides.
- *Decide whether to use Pythagoras' Theorem or trigonometry for problems involving right-angled triangles and apply this to worded problems.*
- *Calculate the exact trigonometric values for 0, 30, 45, 60 and 90 degrees for sine, cosine and tangent.*
- ***Apply the trigonometric ratios to find angles and lengths in 3-D.***
- ***Know and apply the sine rule to find unknown lengths and angles*** $\frac{a}{sinA} = \frac{b}{sinB} = \frac{c}{sinC}$.
- ***Know and apply the cosine rule to find unknown lengths and angles*** $a^2 = b^2 + c^2 - 2bccosA$.

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

Students will practise writing their answers showing full workings out and understand what they will be awarded individual marks for using a mark scheme.

In order to ease the understanding of exam questions, using correct terminology will be emphasised in lessons. Students will also be encouraged to discuss their answers with peers when relevant to develop their understanding of keywords further.

Homework – (Extended Do Now Topics Including Term 1, topics to include a variety from)

1. Using Pythagoras' Theorem
2. Labelling right-angled triangles
3. Choosing a trigonometric function
4. Using Trigonometry to find a missing length
5. Using Trigonometry to find a missing angle

CURRICULUM MAP FOR MATHS
YEAR 10

HALF TERM 4: Perimeter, Area and Volume

Perimeter, Area and Volume

- Calculate the perimeter of a shape given all dimensions.
- Calculate the perimeter of a compound shape.
- *Calculate the perimeter of a triangle where Pythagoras' Theorem or trigonometry must first be used to find all lengths.*
- Calculate the circumference of a circle.
- Calculate the length of an arc for a given sector.
- *Calculate the perimeter of a sector.*
- Know and apply the formulae to calculate the area of: squares, rectangles, parallelograms, triangles and trapezia.
- Calculate the area of a circle.
- *Calculate the area of a sector.*
- ***Use $\frac{1}{2}absinC$ to calculate the area of any triangle.***
- ***Calculate the area of a segment.***
- Construct the nets of 3d shapes.
- Know how to find the surface area of prisms.
- Know and apply the formulae to calculate the volume of cuboids and other prisms including cylinders.
- *Find the surface area and volume of spheres, pyramids, cones and composite solids.*

Students will read worded problems – with pronunciation corrected when necessary. Key words from KS3 to continue to be used with additions of:

Arc
Sector
Segment

Students will practise writing their answers showing full workings out and understand what they will be awarded individual marks for using a mark scheme.

In order to ease the understanding of exam questions, using correct terminology will be emphasised in lessons. Students will also be encouraged to discuss their answers with peers when relevant to develop their understanding of keywords further.

Homework – (Extended Do Now Topics Including HT3, topics to include a variety from)

1. Calculating the perimeter
2. Calculating the circumference
3. Finding the arc length
4. Finding the area of shapes
5. Finding the area of circles
6. Finding the surface area of shapes 7. Finding the volume of shapes

CURRICULUM MAP FOR MATHS
YEAR 10

HALF TERM 5: **Number**

Number

- Use a Venn diagram to organise data.
- Use ξ to denote the universal set; all the items to be included in a Venn diagram.
- *Use ∪ to denote the union of two sets and ∩ to denote the intersection of two sets.*
- ***Use ' to denote to complement of a set.***
- List factors and multiples of a number.
- Identify prime numbers from a list.
- Express a number as a product of its prime factors.
- Use a Venn diagram to sort the prime factors of two different numbers.
- *Use prime factor decomposition and a Venn diagram to find the HCF and LCM of two (large) numbers.*
- Evaluate powers and roots of numbers with integer answers.
- Use the laws of indices when multiplying and dividing two terms with the same base.
- Use the laws of indices to simplify a term involving brackets.
- *Understand what a negative index represents.*
- *Evaluate negative indices for numerical bases.*
- ***Understand what a fractional index represents.***
- ***Evaluate fractional indices for numerical bases.***

Students will read worded problems – with pronunciation corrected when necessary. Key words from KS3 to continue to be used with additions of:
Exponent

Students will practise writing their answers showing full workings out and understand what they will be awarded individual marks for using a mark scheme.

In order to ease the understanding of exam questions, using correct terminology will be emphasised in lessons. Students will also be encouraged to discuss their answers with peers when relevant to develop their understanding of keywords further.

Homework – (Extended Do Now Topics Including Term 2, topics to include a variety from)

1. Drawing Venn diagrams
2. Interpreting Venn diagrams
3. Know what a factor, multiple and prime number is
4. Write a number as a product of its prime factors
5. Simplify indices

CURRICULUM MAP FOR MATHS
YEAR 10

HALF TERM 6: **Number and Angles**

Number

- ***Understand that a surd is a square root that we cannot complete (has an irrational answer - doesn't have an integer answer).***
- ***Simplify and manipulate surds.***
- ***Rationalise the denominator of a fraction.***
- Read large numbers written in standard form and be able to write them as an ordinary number.
- Write large numbers in standard form.
- *Read small numbers written in standard form and be able to write them as an ordinary number.*
- *Write small numbers in standard form.*
- Compare the size of numbers that have been written in standard form.
- Add and subtract numbers that have been written in standard form.
- *Multiply two numbers that have been written in standard form.*
- *Divide two numbers that have been written in standard form.*
- *Apply the use of standard form in scientific context.*

Angles

- Apply angle properties of a straight line, around a point and in a triangle.
- *Work with and calculate interior and exterior angles in regular and irregular polygons.*
- Identify corresponding, alternate and co-interior angles in parallel lines.
- *Calculate missing angles in parallel lines.*
- ***Use circle theorems and be able to deduce a proof of the angle subtended at the centre of the circle is double the angle subtended at the circumference from the same chord.***

Students will read worded problems – with pronunciation corrected when necessary. Key words from KS3 to continue to be used with additions of:

Surd
Rational number
Irrational number
Rationalise
Chord
Subtended
Alternate segment
Same segment

Students will practise writing their answers showing full workings out and understand what they will be awarded individual marks for using a mark scheme.

In order to ease the understanding of exam questions, using correct terminology will be emphasised in lessons. Students will also be encouraged to discuss their answers with peers when relevant to develop their understanding of keywords further.

Homework – (Extended Do Now Topics Including HT5, topics to include a variety from)

1. Writing numbers in standard form 2. Writing numbers in ordinary form 3. Calculating with standard form
4. Using angle properties
5. Finding missing angles