2022-23 CURRICULUM MAP FOR MATHS YEAR 11

HALF TERM 1: Percentages and Graphs

Percentages
- Understand a percentage is a 'number of parts per hundred'.
- Express one quantity as a percentage of another.
- Convert between fractions, decimals and percentages
- Calculate percentages of amounts.
- Solve problems involving percentage increase/decrease and original value.
- Solve problems which require calculating percentage change.
- Calculate simple interest.
- Calculate compound interest.
- Work with percentages greater than 100%.

Graphs
- Plot and draw linear graphs using a table of values.
- Use y=mx+c to find the equation of the line through two points or at one point with a given gradient.
- Identify gradients and intercepts from the equation and graphically.
- Identify parallel **and perpendicular** lines using y=mx+c.
- Plot, draw and be able to sketch quadratic curves.
- Identify and interpret roots, intercepts and turning points of quadratic functions from its graph.
- ***Find the turning points of a quadratic by completing the square.***
- ***Recognise, sketch and interpret simple cubic graphs, the exponential function and trigonometric graphs.***
- ***Recognise and use the equation of a circle with a centre at the origin.***
- ***Find the equation of a tangent to a circle at a given point.***
- ***Estimate the area under a graph.***
- ***Transformations of graphs.***

Students will read worded problems – with pronunciation corrected when necessary. Teachers will demonstrate high quality reading by asking students to listen.

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.

Extended Do Now Topics
Variety of key GCSE skills through exam questions
1. Converting FDP
2. Calculating with fractions, percentages
3. Substitution
4. Plotting linear graphs

HALF TERM 2: Solving equations and inequalities, sequences, surds and standard form.

Algebra
- Form expressions or equations from simple situations
- Solve equations and interpret the solution
- Solve linear inequalities in one *or two* variable
- Solve two linear simultaneous equations algebraically.
- Solve two simultaneous equations graphically.
- *Solve quadratic inequalities in one variable*
- *Use set notation and represent inequalities on a graph*
- *Find approximate solutions to equations numerically using iteration.*
- *Solve two simultaneous equations, when one is quadratic*
- *Translate a simple situation into an algebraic expression, derive two simultaneous equations to interpret a solution to the problem.*

Sequences
- Generate terms of a sequence from either a term-to-term or a position-to-term rule.
- Recognise triangular, square, cube numbers, Fibonacci sequences, quadratic sequences and simple geometric progressions.
- Calculate the nth term of linear sequences.
- *Calculate the nth term of quadratic sequences.*

Surds and standard form
- 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.
- *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.*

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Extended Do Now Topics
Weekly exam questions on topics which are bespoke to each student, based on their individual needs from their mock exams.

HALF TERM 3: Ratio, proportion, probability, compound measures

Ratio/Proportion
- 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.
- Express one quantity as a fraction of another.
- Understand and use proportion as equality of ratios
- Know how to calculate the best buys and quantities of ingredients required in a recipe for more or less people.
- Solve problems involving direct and inverse proportion
- ***Compare lengths, areas and volumes using ratio notation; make links to similarity (including trigonometric ratios) and scale factors.***
- ***Combine ratios using LCM.***

Probability
- Apply systematic listing strategies.
- Construct sample space diagrams and calculate theoretical probabilities from them.
- Calculate the probability of independent events.
- Calculate the probability of independent and dependent combined events using a tree diagram.
- Use and interpret scatter graphs.
- Be able to recognise the correlation, draw estimated lines of best fit and use these to make predictions.
- **Use of the product rule for counting.**

Compound Measures
- Be able to convert between standard units (e.g. time, length, area, volume/capacity, mass) and compound units (e.g. speed, rates of pay, prices, density, pressure).
- Know the units required in compound measures such as speed, rates of pay, unit pricing, density and pressure.
- Solve problems involving, speed, distance, time, density, mass and volume.
- Plot and interpret graphs of compound measures (*including reciprocal graphs **and exponential graphs***).

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HALF TERM 4: Geometry

Congruency
- Know the basic congruence criteria for triangles (SSS, SAS, ASA, RHS).
- Apply the concepts of congruence and similarity, including the relationships between lengths, in similar figures.

Transformations
- Identify, describe and construct congruent and similar shapes that have been rotated, reflected, translated (as 2D vectors) and enlarged.
- Including fractional *and negative* scale factors.
- Apply addition and subtraction of vectors and multiplication of vectors by a scalar.
- Understand vectors as a diagram.
- ***Describe the changes from combinations of rotations, reflections and translations.***
- ***Sketch translations and reflections of a given function.***

Constructions
- Know the conventional terms and notation to label and draw diagrams from a written description.
- Use a ruler and compass to construct the perpendicular bisector of a line segment, a perpendicular to a given line from/at a given point, bisect a given angle.
- Solve loci problems.
- Construct congruent and similar shapes.
- Construct and interpret plans and elevations of 3D shapes.

Bearings
- Be able to measure and describe a bearing in 3 figures.
- Know how to draw and measure line segments and angles when given a bearing.
- Use scale factors to read and draw scale diagrams including maps.

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Extended Do Now Topics
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HALF TERM 5: **Revision by reviewing prior learning and addressing misconceptions**

Practise exam papers/walking talking mocks.

Use mock exam analysis to identify topics for revision as necessary for each class group, combined with exam questions.

Possible topics from previous taught content
- Types of number: multiples, factors, primes
- Rounding and estimation
- Calculate with fractions
- Expand, simplify, factorise expressions
- Rearranging
- Solving equations
- Averages from a list and a table
- Presenting data in charts and tables (frequency polygons, bar charts, pie charts, scatter graphs.
- Angle facts
- Angles in polygons
- Bearings
- Pythagoras' Theorem and trigonometry
- *Upper and lower bounds*
- *Convert recurring decimals to a fraction.*
- *Calculate with, simplify and rationalise surds.*
- *Box plots, cumulative frequency diagrams, histograms.*
- *Circle Theorems*
- *Functions*

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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 ability to explain their answers. This will ease the ability to recall key knowledge in exam conditions.

Extended Do Now Topics
Weekly exam questions on topics which are bespoke to each student, based on their individual needs from their mock exams.

HALF TERM 6:

Breakfast revision sessions and after school revision opportunities.