Y10H ROADMAP - Mathematics

Subject Aim: The aim of the Year 10 Higher Tier Maths curriculum is to deepen understanding and develop fluency in the advanced topics required for success at GCSE Higher level. It focuses on mastering key skills, applying mathematical reasoning, and solving complex problems through structured and personalised practice. The curriculum encourages students to make connections across topics, apply maths to real-life and abstract contexts, and prepares them for the demands of Year 11 and beyond.

TERM 1

How do I invest my money wisely?

In the first two Higher Tier units of Year 10, students build on their Key Stage 3 knowledge of percentages, focusing on complex percentage problems including reverse percentages, repeated change, and applications in financial contexts. Calculator methods are embedded throughout. The second unit extends their understanding of surface area and volume by introducing the formulae for pyramids, cones, and spheres, while reinforcing key geometric concepts through problem-solving in real-world scenarios.

TERM 2

How do I solve simultaneous equations?

This term begins with solving simultaneous equations using both algebraic and graphical methods, including equations with variables on both sides. Students then build on their prior work with rearranging formulae, moving on to more complex and unfamiliar expressions. Trigonometry is introduced through right-angled triangles, with an emphasis on understanding sine, cosine, and tangent as ratios, and applying them in a variety of contexts. The term concludes with loci and geometric constructions, where students develop precision and reasoning through practical applications using compasses and straight edges.

TERM 3

How can a graph help me decide which taxi firm to use?

Students begin by revisiting and extending their work on linear graphs, focusing on the general form $y = mx + c$, interpreting gradients and intercepts in both mathematical and real-life contexts. This leads into work on real-life graphs, including distance-time and velocity-time graphs, with an emphasis on interpreting and analysing key features. Students then revisit Venn diagrams, introducing formal set notation and using them to solve complex probability problems. The fourth unit develops their understanding of probability through tree diagrams, covering both independent and dependent events with increasingly challenging contexts.

TERM 4

Why does a balloon pop?

This term focuses on deepening students' understanding of compound measures through density and pressure, applying these concepts in real-life contexts and linking them to algebraic manipulation. The next unit covers ratio and proportion, with students solving more complex problems and exploring links to algebra and geometry. This is followed by work on non-linear graphs, including cubic, reciprocal, and exponential functions, where students learn to recognise their distinct shapes and interpret key features. The term ends with a unit on sequences, reviewing linear sequences and extending to quadratic and geometric sequences, including finding the nth term.

TERM 5

How can data be biased?

Higher tier students begin this term by exploring sampling, bias, and the capture-recapture method. Key Stage 3 work on direct and inverse proportion is extended to include forming complex equations using a constant of proportionality, with graphs of proportion revisited. Students review enlargement by a positive scale factor before progressing to the higher tier topic of enlargement using a negative scale factor, followed by further work on combining transformations. The term ends by building on earlier work on limits of accuracy through calculating upper and lower bounds in complex contexts.

TERM 6

How do I power a power?

This final unit of Year 10 consolidates students' understanding of powers before introducing negative and fractional indices in detail. Students revisit converting fractions to recurring decimals and then learn techniques for reversing the process. Building on prior work with brackets in Years 8 and 9, higher tier students move on to expanding triple brackets. They also learn to solve quadratic equations by completing the square, including cases where the coefficient of x^2 is not 1. The year concludes with a data unit covering cumulative frequency diagrams, box plots, and key measures such as quartiles and interquartile range. Histograms will be introduced in Year 11.

ASSESSMENT

All lessons will assess understanding through a range of activities, including diagnostic questions, mini whiteboard tasks, and find-and-fix activities. Lessons are regularly punctuated with hinge questions, key statements, and opportunities for discussion. In addition to these ongoing checks for understanding, students will complete formal assessments once each term and sit their Year 10 mock exams in Term 6.

INDEPENDENT LEARNING

Sparx Maths is used throughout the year to support independent learning, revision, and personalised "fix-up tasks" following assessments. Weekly independent learning on Sparx is closely aligned with lesson content and includes bespoke tasks tailored to each student's needs, with both the content and level of difficulty personalised. These tasks enable students to consolidate and revisit material most relevant to their individual progress. Knowledge Organisers are also used weekly to reinforce key vocabulary and support learning across the curriculum.

ENRICHMENT

- Maths challenge activities.
- Maths' relays allowing opportunity for problem solving.

What Next? This year has built on previous knowledge to allow students to solve more complicated multi-step problems. The next year builds on this knowledge whilst time is allowed for retrieval and exam practice.

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