Year 7: Why this? Why now?

Grace Academy

Subject: Maths

This term, we are studying…

Term	Topic(s)	Why this? Why now?
1	Where are sequences seen in real life? What are the properties of a number? What's the difference between Expressions & Equations? How can we work out percentage of an amount in everyday life? How do we use percentages and fractions in our day to day life?	Basic calculations are needed as the foundational understanding for students to continue building on. Students will be introduced to the basics of algebra, this will allow students to continue to build on this knowledge throughout their journey at Grace Academy. Students will begin their journey on understanding decimals, fractions and percentages which are important number skills.
2	How can we use calculations in everyday life? How can we use negative numbers in everyday life? How can we use fractions in everyday life?	Students will begin their journey on calculating with fractions which are important number skills for real life. Students will further investigate properties of numbers, and begin to classify numbers into groups.
3	How does measurements apply to Mathematics and everyday life? How do we use angles in diagrams and problems? How can probability & statistics be useful in real life?	Angles will be introduced to year 7 in order for them to apply angle rules and facts to find missing angles. Probability and statistics play a key role in many jobs, and are used by many members of society to represent information. Students learn how to represent data in a graphical form. They will explore sequences and patterns.

Year 8: Why this? Why now?

Grace Academy

Subject: Maths

This term, we are studying…

Term	Topic(s)	Why this? Why now?
1	How can we use ratio in everyday life? How can we use calculations in everyday life? Where do we use calculations involving Fractions? How can we use sequences in everyday life? How can we use lines in everyday life? How can we use probability in everyday life?	Students will learn the difference between ratio and proportion and how this can relate to real life scenarios. Students will explore further how to calculate with Fractions, Decimals and Percentages. Students will start to learn how probability and statistics are used to represent data. Students will further delve into linear graphs, exploring gradients and the equation of the straight line. This understanding will allow students to have a solid base for other types of graphs.
2	How can Expanding & Factorising complement each other? How can we use equations in everyday life? How can we use angles in everyday life?	Students will apply their knowledge learnt in year 7 to new concepts such as Expanding & Factorising. Students will further delve into their algebraic understanding by solving equations and inequalities.
3	How do we calculate Area, Surface Area, Perimeter & Volume? How do we compare data in everyday life? How can we use averages in everyday life?	Students will use calculate Surface Area & Volume. Being able to calculate Surface Area & Volume is important for real life scenarios. Students will begin to use their prior knowledge on angles to begin investigating angles in missing shapes. Averages & Probability play a key role in many jobs, and are used by many members of society to represent information.

Year 9: Why this? Why now?

Grace Academy

Subject: Maths

This term, we are studying…

Term	Topic(s)	Why this? Why now?
1	How can we use graphs in everyday life? Is Algebra there to make things easy or difficult? How can we use algebra in everyday life? Do I use Angles and Shapes every day in my life? How can we use area in everyday life?	Students will extend their knowledge on plotting graphs by interpreting and manipulating graphs. Students will use their knowledge of area to calculate volume of prisms and will start to apply their knowledge to real life situations. Students will begin to explore quadratics and how these can be solved within equations and inequalities.
2	How can we use negative numbers in everyday life? Are we using Percentages & Fractions in our day-to-day life? How can we use Indices & Surds to determine accuracy? How can we use Pythagoras in everyday life?	Students begin by recapping key skills such as calculating with Fractions and Percentages. This will allow them to use these skills in exploring sequences, working with algebraic skills and calculating with angles. Students will also begin to explore Indices & Surds and how numbers can be defined. Pythagoras Theorem is investigated by students in year 9, and they begin to use Pythagoras theorem to find missing side lengths.
3	How can we use enlargement in everyday life? How can we use Ratio in real life? How can we use probability in real life?	Ratio and proportion teach students skills for sharing and dividing. These are skills that are essential for many real-life situations, cooking and recipes is one of those areas.

	What is the purpose of a Sequence?	

Year 10: Why this? Why now?

Grace Academy

Subject: Maths

This term, we are studying…

Term	Topic(s)	Why this? Why now?
1	How do we manipulate Expressions and use Functions? What is the difference between Pythagoras theorem and Trigonometry? What is the difference between equations and inequalities? How can we use represent equations using graphs?	Students will continue to build on their previous knowledge, exploring linear & quadratic sequences and using algebraic skills to manipulate algebra. Students will start to find missing lengths using Pythagoras theorem and begin to explore the use of Trigonometry to find missing angles and side lengths in a right-angled triangle.
2	How do we use Angles in diagrams and problems? How do we calculate Areas & Volume with 2D & 3D shapes? How do we use Fractions & Percentages to represent proportion and calculate changes in value? How do we use Ratio and Proportion in real life? How can Probability be useful in real life?	Students will explore types of angles and how these can be applied to problems. Students will further their knowledge on solving quadratic equations, simultaneous equations and inequalities. Students will also work on finding area & volume of 3D shapes and exploring how this skill can be applied to real scenarios e.g. filling swimming pools, seeding a garden etc. Students will continue to investigate how probability can be represented, as well as studying further statistical diagrams and how they can be drawn and interpreted for real life situations.
3	How can Statistics be useful in real life? How do we describe and understand Sequences?	Students will begin to look at error intervals and rounding which allows us to make estimations for calculations. Ratio and proportion teach students skills for sharing and dividing. These are skills

	How do we determine accuracy with numbers?	that are essential for many real-life situations, cooking and recipes is one of those areas.

Year 11: Why this? Why now?

Grace Academy

Subject: Maths

This term, we are studying…

Term	Topic(s)	Why this? Why now?
1	How to calculate gradients and understand the relationship between gradients and straight lines on a graph?	Understanding gradients and straight lines is essential for solving problems related to rates of change, such as velocity, and for interpreting graphs in subjects like physics and economics.
	How to explore graphs that represent non-linear relationships, such as quadratic and exponential functions?	These graphs, like quadratic and exponential curves, appear frequently in both real-life and exam scenarios. Mastering them now is key to understanding complex relationships and making predictions.
	How to interpret and analyse various types of graphs to solve real-world problems?	Graph interpretation is a vital skill, not only for mathematics but also for data analysis in subjects like science and geography. Year 11 is a crucial time to solidify this ability for both exams and practical applications.
	How to practice expanding brackets and factorising expressions, key skills in algebraic manipulation?	These algebraic skills are necessary for simplifying expressions and solving quadratic equations, which are foundational topics in higher-level mathematics and are tested heavily in exams.
	How to rearrange formulas to make different variables the subject of the equation?	This skill allows students to rearrange formulas, an important competency in both maths and sciences. It helps them handle complex equations and prepares them for higher-level algebra.
	How to work with mathematical functions, including their notation and application?	Functions introduce a more formalized way of thinking about relationships between variables, which is key for calculus and advanced topics. Year 11 is the right time to

		master this as students prepare for further studies in maths or STEM fields.
2	How to use multiplication, ratios, and proportions to solve a variety of real-world and mathematical problems?	Multiplicative Reasoning helps students develop a deep understanding of ratios, proportions, and scaling, which are vital in real-world applications, such as problem-solving with rates, finance, and data interpretation.
	How to reason about geometric shapes, angles, and their properties?	Geometric Reasoning is crucial for visualizing and solving problems involving shapes, angles, and the properties of space, which will be necessary for both exams and practical situations in fields like architecture and engineering.
	How to manipulate algebraic expressions and solve equations to recognize patterns and relationships between variables?	Algebraic Reasoning builds foundational skills in manipulating algebraic expressions, solving equations, and identifying patterns, preparing students for more advanced mathematical challenges.
	How to construct shapes and diagrams accurately?	Transforming & Constructing strengthens their spatial awareness and understanding of geometric transformations, which are important for graphical analysis and geometric proofs.
	How to organize and describe sets of data, such as listing outcomes and using systematic approaches for problem-solving?	Listing & Describing teaches problem-solving techniques related to combinatorics and probability, which helps students think logically and methodically, key skills for data analysis and decision-making.

Year 12: Why this? Why now?

Grace Academy

Subject: Maths

This term, we are studying…

Term	Topic(s)	Why this? Why now?
1	Algebraic expressions Quadratics Equations and Inequalities Graphs and Transformations Straight line graphs Circles Algebraic Methods The Binomial Expansion Trigonometric ratios Trigonometric identities and equations	The first part of the A level course is a recap of GCSE knowledge. This foundation knowledge is the bread and butter in which A level maths is built upon. This whole term reviews and consolidates those essential number and algebraic topics that are required for future skills. It is important that students learn this well in order for them to progress positively.
2	Vectors Differentiation Integration Exponentials and Logarithms Modelling in Mechanics Constant Acceleration Forces & Motion Variable Acceleration	This term students will learn new content such as differentiation and integration this will teach them vital skills that will allow them to use calculus to ascertain minimum, maximum and solve problems. We start to explore the applied side of maths, mechanics and learn how maths can be applied in real life situations Links to physics.
3	Data Collection Measures of location and spread Representations of data Correlation Probability Statistical distributions Hypothesis testing	This term is spent looking at statistics and the use of statistics in the real world. We will look at collecting data and testing to check validity of hypothesis. Links to Psychology.

Year 13: Why this? Why now?

Grace Academy

Subject: Maths

This term, we are studying…

Term	Topic(s)	Why this? Why now?
1	Algebraic methods Functions & Graphs Sequences & Series Binomial expansions Radians Trig functions Trig modelling Parametric equations Differentiation Integration Vectors	This whole term reviews and consolidates the essential number and algebraic topics that are required for future skills. We explore the use of trigonometry in modelling practical real life situations. New rules of differentiation & integration is used to develop algebraic skills further. It is important that students learn this well in order for them to progress positively.
2	Regression, correlation and hypothesis testing Conditional probability The normal distribution Moments Forces & Frictions Vectors Projectiles Application of forces Further Kinematics	We continue to explore the applied side of maths, mechanics and learn how maths can be applied in real life situations Links to physics. The use of statistics in the real world is explored further. We will look at collecting data and testing to check validity of hypothesis. Links to Psychology.