

# Curriculum Statement - Maths

At MSFG, from 2023, our curriculum has been adapted to meet the following aims:

- Suitable time is given to cover concepts in depth
- Develop fluency, reason mathematically and solve problems
- Retrieval practice
- Supports and challenges all learners
- Give students and staff the time needed to decide on tier of entry at GCSE, keeping full alignment of all groups until Summer Term in Year 10.

In Year 7, we ensure learners have fluency in basic number sense and calculations, the building blocks for mathematical competency throughout the years. We also introduce students to manipulating algebraic expressions and solving equations as they begin to form their algebraic thinking.

In Year 8, pupils will continue to build on their foundations from Year 7, whilst we begin to explore links between topics, such as algebraic fractions. Pupils in Year 8 also focus on integral elements of Geometry, including circles, surface area and volume as well as being introduced to the vital mathematical constant,  $\pi$  !

In Year 9, we recall prior content whilst adding deeper understanding and more conceptual thought. This is also the year that students will learn about Pythagoras' theorem and quadratics!

In Year 10, we continue to retrieve previous knowledge and start to prepare learners for GCSE style questions concepts not in KS3. We explore more conceptual areas of mathematics like Sets. This is also the year that pupils are introduced to simultaneous equations and trigonometry. In the Summer Term of Year 10, pupils will branch off into a Higher or Foundation curriculum pathway. No final decisions on a learner's tier will be made until Year 11, but as the Higher tier exam tests different content, it is important students begin to focus on a likely tier of entry.

In Year 11, pupils on the Foundation pathway will mostly be revisiting previously learnt content, but more in-depth. They will finish specifically taught content in the Spring term and will spend the Summer term preparing for their GCSE exams. Pupils on the Higher pathway will cover Higher-only content such as 3D Trigonometry and algebraic proof. This will provide learners with a solid foundation to go onto study Maths and Further Maths at A Level, should they choose to.

# Assessment Structure

- Years 7-10 will sit an Assessment at the end of each term. Their most recent assessment will be used for their reports.
- Year 7 will sit a Baseline Assessment when they join in September to allow us to understand their prior learning and identify any gaps in knowledge that need to be addressed.
- Year 11 will sit Mock Exams, which will be full GCSE papers during exam periods. They will sit one Non-Calculator and one Calculator Paper.

# Year 7

Strand key:

Number

Algebra

Geometry

Probability

Statistics

Ratio & Proportion

Students enter Year 7 with prior mathematical knowledge from the [KS2 national curriculum](#). Due to the spiral nature of our curriculum, they will be given an opportunity to review and recall KS2 knowledge and skills throughout their KS3, whilst continuing to build upon these foundations as we progress through the curriculum.

Term	Block	Unit	Length (weeks)
Autumn	Number sense and calculations	Number sense	1
		Adding and subtracting	1
		Multiplying	1
		Dividing	1
		Calculating with negative numbers	1
		Order of operations	1.5
	Expressions and equations	Expressions	1
		Substitution	1
		Solving equations	1
	Measures	Time	1
Measures		1	
Spring	2D Shapes	Line and shape properties	1
	Perimeter and area	Perimeter	1
		Area	2
	Coordinates	Coordinates and shapes	1
	Factors, multiples and primes	Factors and multiples	1
		Primes	1
	Fractions	Writing and comparing fractions	2.5
		Adding and subtracting fractions	1.5
	Brackets	Single brackets	1
	Summer	Angles	Angles
Finding unknown angles			1
Handling data and statistical diagrams		Averages and range	1
		Tables and charts	1
		Collecting and presenting data	1
Proportion		Proportion word problems	1
Fractions, decimals and percentages		Multiplying and dividing fractions	1
		Fractions of amounts	1
		Fractions, decimals and percentages	2
Probability		Theoretical probability	2

# Year 8

Strand key:

Number

Algebra

Geometry

Probability

Statistics

Ratio & Proportion

Term	Block	Unit	Length (weeks)
Autumn	Percentages	Percentages of amounts	1
		Percentage change	1
	Money	Calculating with money	1
	Indices	Index laws	2
	Equations	Solving equations	2
	Sequences	Term-to-term rules	1
		Position-to-term rules	1
	Ratio	Ratio Review	1
	Factors, multiples and primes	Factors and multiples	1
Spring	Coordinates	Coordinates and shapes	1
	Coordinates	Coordinates and midpoints	1
	Handling data and statistical diagrams	Averages and range	1
		Tables and charts	1
		Collecting and presenting data	1
	Rounding	Significant figures	1
	Standard form	Standard form and ordinary numbers	1.5
	Venn diagrams	Venn diagrams	1
		Factors, multiples and primes	1
3D shapes	Nets	1	
Surface area and volume	Surface area	1	
	Volume	1.5	
Summer	Linear graphs	Plotting graphs and finding equations	1
	Transformations	Transforming shapes	1
	Angles	Finding unknown angles Review	1
		Angles in a polygon	1
	Statistical diagrams	Drawing and interpreting statistical diagrams	2
	Inequalities	Linear inequalities	1
	Brackets	Double brackets	1
	Algebraic fractions	Fractions review	1
		Algebraic fractions	1.5
Recurring decimals	Fractions and recurring decimals	1.5	
End of Year Summer Unit		Recap of year 8	

# Year 9

Strand key:

Number

Algebra

Geometry

Probability

Statistics

Ratio & Proportion

Term	Block	Unit	Length (weeks)
Autumn	Fractions and percentages	Fractions, decimals and percentages review	1
		Percentage change	1
	Rounding	Significant figures	1
	Standard form	Standard form and ordinary numbers	1
		Calculations with standard form	1
	Inequalities	Linear inequalities	1
	Quadratic equations	Factorising and solving quadratic equations	1.5
	Formulae	Rearranging formulae	1.5
	Recurring decimals	Fractions and recurring decimals	1.5
Circles	Circles and cylinders	1.5	
Spring	Rounding	Error intervals	1
	3D shapes	Representations of 3D shapes	1
	Pythagoras' theorem	Pythagoras' theorem in 2D	2
	Ratio and proportion	Ratio	1
		Proportion word problems	1.5
	Linear graphs	Equations of linear graphs	2
	Compound measures	Speed and rates	2
Motion-time graphs	Distance-time graphs	1.5	
Summer	Quadratic graphs	Plotting and interpreting quadratic graphs	1.5
	Angles and bearings	Angles	1
		Bearings	1
	Transformations	Transforming shapes	1
	Similarity and congruence	Similarity	1
		Congruence	1
	Handling data and statistical diagrams	Collecting and presenting data Review	1.5
		Scatter graphs Review	
	Vectors	Grouped data	2
		Column vectors	1.5
End of Year Summer Unit		Recap of KS3	

# Year 10

Strand key:

Number

Algebra

Geometry

Probability

Statistics

Ratio & Proportion

Year 10 is the beginning of KS4. By this point, students will have pre-requisite knowledge and skills outlined in the [KS3 Programmes of Study](#). We will embark on developing mathematical fluency, reasoning and problem solving skills required for the [KS4 Programmes of Study](#). During the summer term in Year 10, students' curriculum will fork into two different curriculum pathways, Higher or Foundation.

Term	Block	Unit	Length (weeks)
<b>Autumn</b>	Percentages	Percentage change	2
	Surface area and volume	Surface area	2
		Volume	1.5
	Simultaneous equations	Linear simultaneous equations	2
	Formulae	Rearranging formulae	1
	Trigonometry	Right-angled trigonometry	2.5
<b>Spring</b>	Constructions	Constructions and loci	1
	Linear graphs	Equations of linear graphs	2
	Real-life graphs	Plotting and interpreting real-life graphs	2
	Set notation	Venn diagrams and set notation	1
	Tree diagrams	Independent and dependent events	2
	Compound measures	Density and pressure	1
	Ratio	Working with ratios and algebra	2
	Graphs	Velocity-time graphs	1
Cubic, reciprocal and exponential graphs		1	
<b>Summer (F)</b>	Sequences	Arithmetic and geometric sequences	1
	Handling data	Sampling	1
	Proportion	Direct and inverse proportion	1.5
	Transformations	Transforming shapes	1
	Rounding	Error intervals	1
	Indices	Index laws	1
	Brackets	Expanding and factorising brackets	2.5
	Handling data and statistical diagrams	Grouped data	1
		Drawing and interpreting statistical diagrams	2
<b>Summer (H)</b>	Sequences	Quadratic and geometric sequences	1
	Handling data	Sampling	1
	Proportion	Direct and inverse proportion	1.5
	Transformations	Transforming shapes	1
	Rounding	Bounds	1
	Indices	Index laws	1
	Recurring decimals	Fractions and recurring decimals	1
	Brackets	Expanding and factorising brackets	2
	Handling data and statistical diagrams	Cumulative frequency graphs	1
Box plots		1.5	

# Year 11 (Foundation)

Strand key:

Number

Algebra

Geometry

Probability

Statistics

Ratio & Proportion

Term	Block	Unit	Length (weeks)
<b>Autumn</b>	Factors, multiples and primes	HCF and LCM	1
	Fractions	Fractions and mixed numbers	1
	Expressions	Simplifying expressions	1
	Equations	Solving equations	1.5
		Simultaneous equations	1
	Right-angled triangles	Pythagoras' theorem and trigonometry	1.5
	Surface area and volume	Surface area	1
		Volume	1
	Angles	Finding unknown angles	1
	Statistical diagrams	Drawing and interpreting statistical diagrams	2
<b>Spring</b>	Probability	Theoretical and experimental probability	1.5
	Inequalities	Linear inequalities	1
	Vectors	Vector problems	1.5
	Percentages	Percentage change	1
	Compound measures	Calculating with compound measures	1
	Ratio and proportion	Working with ratios and algebra	1
		Proportion word problems	1
	Standard form	Calculating with standard form	1
	Sequences	Arithmetic and geometric sequences	1
Linear graphs	Equations of linear graphs	2	
<b>Summer</b>	Revision		

Strand key:

Number

Algebra

Geometry

Probability

Statistics

Ratio &amp; Proportion

# Year 11 (Higher)

Term	Block	Unit	Length (weeks)
<b>Autumn</b>	Surds	Calculating with surds	1
		Rationalising denominators	1
	Algebraic fractions	Calculating with algebraic fractions	1
	Equations	Solving quadratic equations	1.5
		Simultaneous equations	1.5
	Pythagoras' theorem and trigonometry	Trigonometric ratios and graphs	1
		Non right-angled trigonometry	1
		3D Pythagoras' theorem and trigonometry	1
	Circle geometry	Circle theorems	2
	Statistical diagrams	Histograms	1
<b>Spring</b>	Probability	Conditional probability	1.5
	Inequalities	Linear and quadratic inequalities	1
	Functions	Substituting into functions	1
		Finding composite and inverse functions	1
	Transformations	Transforming graphs	1
	Iteration	Using iterative formulae	1
	Algebraic proof	Writing algebraic proofs	1
	Similarity	Area and volume of similar shapes	1
	Geometric proof	Vector proofs	1
		Writing geometric proofs	1
Graphs	Non-linear graphs	1.5	
<b>Summer</b>	Revision		

## A-Level Mathematics Schedule

		Year 12			
		Teacher 1		Teacher 2	
AUT1	Week 1			Baseline	
	Week 2	P1.2	Quadratics	P1.1	Algebraic Expressions
	Week 3				
	Week 4				
	Week 5	P1.4	Graphs and Transformations	P1.3	Equations and Inequalities
	Week 6				
	Week 7	TTP1			
	Week 8	P1.5	Straight Lines	S1.1	Data Collection
	Break				
	Break				
AUT2	Week 1	P1.5	Straight Lines	S1.2	Location and Spread
	Week 2				
	Week 3				
	Week 4	P1.6	Circles	S1.3	Representations of Data
	Week 5			S1.4	Correlation
	Week 6	TTP2		TTA2	
	Break				
	Break				
SPR1	Week 1	M1.8	Introduction		
	Week 2			P1.9	Trigonometric Ratios
	Week 3	M1.9	Constant Acceleration		
	Week 4			P1.10	Trigonometric Equations/Identities
	Week 5	TTA7			
	Week 6	P1.7	Algebraic Methods	TTP4	
	Break				
SPR2	Week 1	P1.7	Algebraic Methods	S1.5	Probability
	Week 2			TTA3	
	Week 3	P1.12	Differentiation		
	Week 4			P1.8	Binomial Expansion
	Week 5				
	Week 6	TTP3		P1.11	Vectors

	Break				
	Break				
SUM1	Week 1			P1.11	Vectors
	Week 2	M1.10	Forces and Motion		
	Week 3			P1.14	Exponentials and Logarithms
	Week 4	TTP6			
	Week 5			TTP8	
	Week 6	P1.13	Integration	S1.6	Distributions
	Break				
SUM2	Week 1	P1.13	Integration	S1.6	Distributions
	Week 2	End of Year Exams			
	Week 3				
	Week 4	M1.11	Variable acceleration	S1.7	Hypothesis Testing
	Week 5				
	Week 6				

### A Level Maths

Students who choose A Level Maths (and not Further Maths) take it as a 2 year course, which is taught over 6 periods per week. The content is split in half with one teacher delivering Pure Maths content alongside Mechanics, and another delivering Pure Maths alongside Statistics.

Our curriculum is designed in a way that interleaves the applied maths content with Pure maths and allows students to build their knowledge and skills over time, taking advantage of the spiral nature of the course content.

		Year 13			
		Teacher 1		Teacher 2	
AUT1	Week 1	P2.1	Algebraic Methods	S2.1	Regression/Correlation
	Week 2				
	Week 3	P2.2	Functions and Graphs	P2.3	Sequences and Series
	Week 4				
	Week 5			P2.4	Binomial Expansion
	Week 6	M2.4	Moments	P2.5	Radian Measure
	Week 7				
	Week 8	TTP1-4,A4			
Break					
Break					
AUT2	Week 1	P2.9	Differentiation	P2.6	Trigonometric Functions
	Week 2				
	Week 3				
	Week 4			P2.7	Trigonometry and Modelling
	Week 5	TTP8			
	Week 6	P2.11	Integration	TTP6	
Break					
Break					
SPR1	Week 1	P2.11	Integration	P2.8	Parametric Equations
	Week 2				
	Week 3			TTP7	
	Week 4			P2.10	Numerical Methods
	Week 5	TTP10/11		S2.2	Conditional Probability
	Week 6	M2.5	Forces and Friction		
Break	March Mocks				
SPR2	Week 1	P2.11.5	DEs	P2.12	Vectors
	Week 2	M2.6	Projectiles		
	Week 3	M2.6/7	Projectiles /Applications	S2.3	Normal Distribution
	Week 4				
	Week 5	M2.8	Further Kinematics		
	Week 6				
SUM1		Revision/Exams			

## 'Fast-track Maths'

This curriculum is designed for students who intend on taking both Maths and Further Maths A Level.

Our curriculum allows students to obtain mastery of the A Level Maths content in Year 12, where they are taught the full A Level in 1 year, and then they will proceed to study the Further Maths A Level in Year 13.

Students on the Fast-track Maths curriculum will receive 12 lessons per week.

## A-Level Maths Fast-track Schedule

		Year 12					
		Teacher 1		Teacher 2		Teacher 3	
AUT1	Week 1	P1.1	Algebraic Expressions	P1.2 / Baseline	Quadratics	S1.1	Data Collection
	Week 2	P1.5	Straight Line Graphs	P1.3	Equations and Inequalities	S1.2	Location and Spread
	Week 3						
	Week 4	P1.6	Circles	P1.4	Graphs and Transformations	S1.3	Data Representations
	Week 5					S1.4	Correlation
	Week 6	TTP2		TTP1		TTA2	
	Week 7	P1.7	Algebraic Methods	P1.9	Trigonometric Ratios	M1.8	Introduction
	Week 8						
Break							
Break							
AUT2	Week 1	P1.8	Binomial Expansion	P1.9	Trigonometric Ratios	M1.9	Constant Acceleration
	Week 2			P1.10	Trigonometric Identities and Equations		
	Week 3	TTP3				TTA7	
	Week 4	P1.12	Differentiation	TTP4		S1.5	Probability
	Week 5			P1.11	Vectors	S1.6	Distributions
	Week 6			P1.14	Exponentials and Logarithms	M1.10	Forces and Motion
	Break						
Break							
SPR1	Week 1	TTP6		P1.14	Exponentials and Logarithms	M1.10	Forces and Motion
	Week 2	P1.13	Integration				
	Week 3	P2.3	Sequences and Series	P2.1	Algebraic Methods	TTA8	
	Week 4			P2.2	Functions and Graphs	S1.7	Hypothesis Testing
	Week 5	P2.4	Binomial Expansion			M1.11	Variable Acceleration
	Week 6						
Break							
SPR2	Week 1	TTP4		P2.5	Radian Measure	M2.4	Moments
	Week 2	P2.9	Differentiation	P2.6	Trigonometric Functions		
	Week 3			P2.7	Trigonometry and Modelling	M2.5	Forces and Friction
	Week 4					S2.1	Regression/Correlation
	Week 5	P2.11	Integration	TTP6		S2.2	Conditional Probability
	Week 6			P2.8	Parametric Equations	M2.6 / TT	Projectiles
	Break						
Break							
SUM1	Week 1	P2.11	Integration	P2.10	Numerical Methods	M2.7	Applications of Forces
	Week 2			P2.12	Vectors		
	Week 3	P2.11.5	DEs				
	Week 4	FM		FM		S2.3	Normal Distribution
	Week 5	FM		FM		FM	
	Week 6	FM		FM		FM	
Break							
SUM2	Week 1	EOY Assessment					
	Week 2						
	Week 3						
	Week 4	FM					
	Week 5						
	Week 6						

## A Level Further Maths

Learners on this curriculum pathway will already have the knowledge and skills required for A Level Maths prior to embarking upon the Further Maths course. The course is broken into the following components and will receive lesson time that is proportionate to their course weighting.

Whilst schools have choice over which components they take for 50% of this course, at MSFG we teach Further Pure and Decision.

Core Pure – 50% (compulsory content)

Further Pure – 25% (chosen component)

Decision – 25% (chosen component)

## Year 13 Further Maths Schedule

		T1 CP		T2 FP1		T3 D1	
AUT1	Week 1	CP1.3, CP1.4	Series, Polynomials	FP1.2	Conic Sections 1	D1.3	Algorithms on Graphs
	Week 2	CP1.4, CP1.5	Polynomials, Revolution				
	Week 3	TT, CP1.8	Induction	FP1.4	Inequalities		
	Week 4	CP1.9	Vectors	FP1.5, TT	t-formulae	TT	
	Week 5			FP1.8	Numerical Methods	D1.4	Route Inspection
	Week 6	TT		FP1.1	Vectors	D1.4, D1.6	Route Inspection, Linear Programming
	Week 7	CP2.1	Complex Numbers				
	Week 8						
Break							
Break	AS CP		AS FP		AS D1 reduced		
AUT2	Week 1	CP2.2	Series	FP1.1	Vectors	D1.6	Linear Programming
	Week 2	CP2.3	Methods in Calculus			D1.5	Travelling Salesman
	Week 3	CP2.4, CP2.5	Revolution, Polar	FP1.3	Conic Sections 2	TT	
	Week 4	CP2.5	Polar Coordinates			D1.8	Critical Path Analysis
	Week 5	CP2.5, TT					
	Week 6	CP2.6	Hyperbolic Functions	TT			
Break							
Break							
SPR1	Week 1	January Mocks (Single)					
	Week 2	CP2.6	Hyperbolic Functions	FP1.6	Taylor Series	D1.7	The Simplex Algorithm
	Week 3	CP2.7	Methods in DEs				
	Week 4	CP2.7, CP2.8	DEs, Modelling with DEs	FP1.7	Methods in Calculus		
	Week 5	CP2.8	Modelling with DEs	FP1.9	Reducible DEs		
	Week 6	Revision					
Break							
SPR2	Week 1	Revision		Revision		Revision	
	Week 2	March Mocks (Further)					
	Week 3						
	Week 4	Revision		Revision		Revision	
	Week 5						
	Week 6						