Maths Learning Journey

WHICKHAM SCHOOL

Year 7 — Fluency, Problem Solving and Reasoning — Year 11

Year 7

Graphs
- Using & interpreting real life graphs
- *Gradient as a rate of change. Equation of a circle and tangent to a curve*
- Gradients & lines.

Mathematical reasoning
- Multiplicative reasoning. Proportion, enlargement and compound measures.
- Algebraic reasoning. Sequences, simultaneous equations recap, *algebraic fractions and algebraic proof.*
- Geometric reasoning. Angles, bearings, Pythagoras' theorem and trigonometry, vectors and *circle theorems*

Revision & exam technique
- Past exam papers
- Personalised PLTs
- Revision sessions
- Lessons tailored to gaps in knowledge identified in mock exams

Exams & post 16 study

Algebra
- Changing the subject *where the subject appears more than once*
- *Iteration*
- Expanding & factorising. Solving equations including quadratics. Sketching quadratics.
- Functions. *Evaluating, composite and inverse functions*

YEAR 11

Using number
- Indices & roots recap
- Error intervals & *bounds*
- Pressure + Density
- Surds
- Non-calculator methods

Delving into data
- Working with averages.
- *Histograms, cumulative frequency and box plots*
- Collecting, representing & interpreting data

Proportional change
- Probability recap. Tree diagrams. *Conditional probability*
- Ratio, percentages & fraction recap
- *Sequences*
- *Percentage change reasoning*

Geometry
- Vector notation *& proof*
- Working with circles
- Volume of spheres and cones
- Angles & bearings

YEAR 10

Representations
- Set notation and Venn diagrams
- Surds
- Probability diagrams

Equations and inequalities
- $y = mx + c$ recap. Solving equations graphically
- Representing solutions of equations & inequalities
- *Solving quadratic equations by factorisation*

Similarity
- *3D Pythagoras'*
- Trigonometry
- Congruence, similarity & enlargement
- Pythagoras' Recap
- Simultaneous equations

Proportional reasoning
- Solving ratio & proportion problems
- Enlargement & similarity
- Speed, distance and time

YEAR 9

Reasoning with geometry
- Pythagoras' theorem
- Transformations
- Angles recap

Reasoning with number
- Using percentages
- Compound Interest
- Numeracy recap

2D and 3D dimensions
- Constructions
- Volume and surface area
- Congruence
- Plans, elevations, nets and scale drawings

Reasoning with algebra
- Forming & solving equations and inequalities
- Testing Conjectures
- Straight line graphs $y = mx + c$ *Equations of parallel lines*

Reasoning with data
- Averages and spread
- The data handling cycle

YEAR 8

Lines & angles
- Developing geometric reasoning. *Angles in parallel lines and polygons.*
- Constructing, measuring & using geometric notation
- Interpret pie charts

Proportional reasoning
- Ratio & Scale
- Multiplying & dividing fractions
- Multiplicative change

Representations
- Representing data
- Working in the Cartesian plane
- Tables & probability

Algebraic techniques
- Brackets, equations & Inequalities
- Indices
- Sequences

Developing number
- Standard index form
- Fractions & percentages
- Number sense

Developing geometry
- Area of trapezia & circles
- Angles in parallel lines & polygons

YEAR 7

Fractional thinking
- Addition & subtraction of fractions with different denominators *and mixed numbers*
- Converting between mixed numbers and fractions

Number
- Fraction & percentages of amounts. *Decimal multipliers*
- Solving problems with multiplication & division. *Solving problems with mean, compound area and standard form*

Reasoning with number
- Sets & probability. *Set notation*
- Developing number sense. *Commutativity and proportional reasoning*
- Prime numbers & proof. *Prime factor decomposition, finding HCF and LCM using Venn diagrams, testing conjectures*
- Four operations with directed number. *Squaring negative numbers*

Place value and proportion
- Fraction, decimal & percentage equivalence
- Place value & ordering integers & decimals
- *Rounding to significant figures, estimation, calculating in different bases, median and range, standard form*

Algebraic thinking
- Solving one *and two* step equations
- Understand and use algebraic notation. Substitution
- Exploring sequences, *linking sequences to graphs*