# Armfield Academy – Mathematics Department

# Year 9 Core Curriculum Overview

This maths scheme of work is structured to build securely on prior learning, with concepts sequenced for progression and depth. Retrieval practice is embedded to strengthen fluency and long-term retention. Teaching is responsive, with assessment informing adaptation to meet learners' needs. All pupils are challenged through high expectations, with scaffolds to ensure inclusivity and access for all. The scheme aims to develop problem-solving, reasoning, and resilience alongside core mathematical skills. In year 9 we have the 'Core' and the 'Support' curriculum, these are intertwined and teachers have flexibility and fluidity to push pupils in their charge while embedding fundamental knowledge needed for their GCSE studies in future years.

****Note: Objectives in blue are additional content for extension****

| Term 1 | |
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| Week | Curriculum Overview |
| 1<br>2 | **Properties of Numbers**<br>- Factors, multiples and primes<br>- Write a number as a product of prime factors<br>- Use prime factors (E)<br>- Highest common factor (HCF) and lowest common multiple (LCM)<br>- Venn diagrams<br>- Use a Venn diagram to calculate the HCF and LCM<br>- Integers, real numbers and rational numbers<br>- Introduction to surds (E) |
| 3<br>4 | **Percentages**<br>- Percentage increase and decrease<br>- Express a change as a percentage<br>- Find the original value after a percentage change<br>- Solve problems with percentages (non-calculator)<br>- Solve problems with percentages (calculator)<br>- Repeated percentage change<br>- Understand interest<br>- Simple interest<br>- Compound interest |
| 5<br>6 | **Area and Volume**<br>- Nets<br>- Area of a 2-D shape<br>- Area and circumference of a circle<br>- Surface area of cubes and cuboids<br>- Surface area of a triangular prism (E)<br>- Surface area of a cylinder (E)<br>- Volume of a prism<br>- Volume of a cylinder<br>- Volume of cones, pyramids and spheres (E)<br>- Convert metric units of area and volume (E) |
| 7<br>8 | **Equations, Inequalities and Formulae**<br>- Solve equations and inequalities<br>- Solve equations and inequalities with brackets<br>- Inequalities with negative numbers (E)<br>- Solve equations and inequalities with unknowns on both sides<br>- Solve problems with equations and inequalities<br>- Substitute into formulae and equations<br>- Change the subject of a formula (one-step) |

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| | - Change the subject of a formula (two-step)<br>- Change the subject of complex formula (E) |
| 9 | **Fractions**<br><br>- Add and subtract fractions<br>- Multiply and divide fractions<br>- Fraction of an amount |
| 10<br>11 | **Rates**<br><br>- Speed, distance and time<br>- Distance-time graphs<br>- Solve flow problems and their graphs<br>- Rates of change and their units<br>- Convert compound units (E) |
| 12 | **Standard Form**<br><br>**ASSESSMENT WEEK**<br><br>- Numbers in standard form<br>- Compare and order numbers in standard form<br>- Multiply and divide numbers in standard form<br>- Add and subtract numbers in standard form |
| 13 | **Maths and Money (Week 1)**<br><br>- Understand a bank account<br>- Spending<br>- Ways to pay<br>- Ways to save |
| 14 | **Review and Reteach**<br><br>- Here we allocate a week to reviewing and reteaching in order to reinforce key concepts, address gaps in understanding, and ensure a strong foundation before advancing in the curriculum. |
| **Term 2** | |
| Week | Curriculum Overview |
| 1<br>2 | **Maths and Money (Week 1)**<br><br>- Jobs and pay<br>- Investing<br>- Borrowing (buying a house)<br>- Running a house or a business<br>- Budgeting<br>- Borrowing (loans)<br>- Spending overseas<br>- Insurance |
| 3<br>4 | **Straight Line Graphs**<br><br>- Lines, parallel to the axes, y=x and y=-x<br>- Explore gradients<br>- Explore intercepts<br>- y=mx+c<br>- Rearrange equations to the form y=mx+c (E)<br>- Find the equation of a line from a graph<br>- Interpret gradient and intercepts of real-life graphs<br>- Graph inequalities (E) |

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| 5 | **Ratio and Proportion** |
| 6 | - Direct proportion<br>- Direct proportion and conversion graphs<br>- Inverse proportion<br>- Inverse proportion graphs (E)<br>- Ratio problems (whole or part given)<br>- Solve problems with ratio and algebra (E) |
| 7 | **Construction and Congruency** |
| 8 | - Draw and measure angles<br>- Construct and interpret scale drawings<br>- Construct triangles using ASA, SAS and SSS<br>- Construct an angle bisector<br>- Construct a perpendicular bisector<br>- Construct a perpendicular from or to a point<br>- Construct more complex polygons<br>- Identify congruent figures<br>- Congruent triangles |
| 9 | **Similarity**<br><br>**ASSESSMENT WEEK**<br><br>- Recognise enlargement and similarity<br>- Work out unknown lengths and angles in similar shapes<br>- Solve problems with similar triangles (E)<br>- Ratio in right-angled triangles (E) |
| 10 | **Algebraic Manipulation** |
| 11 | - Expand single brackets and simplify<br>- Factorise into a single bracket<br>- Expand double brackets<br>- Use identities<br>- Factorise quadratic expressions (E)<br>- Solve quadratic equations (E)<br>- Expand triple brackets (E) |
| | **Term 3** |
| Week | Curriculum Overview |
| 1 | **Revision and Reteach**<br><br>- Here we allocate a week to reviewing and reteaching in order to reinforce key concepts, address gaps in understanding, and ensure a strong foundation before advancing in the curriculum. |
| 2 | **Pythagoras' Theorem** |
| 3 | - Solve equations with squares and square roots<br>- Identify the hypotenuse<br>- Determine whether a triangle is right-angled<br>- Pythagoras theorem (find the hypotenuse)<br>- Pythagoras theorem (find any side)<br>- Use Pythagoras theorem on coordinate axes<br>- Proofs of Pythagoras theorem (E)<br>- Pythagoras theorem in 3-D shapes (E) |
| 4 | **Non-Linear Graphs** |
| 5 | - Substitute into quadratic expressions<br>- Draw simple quadratic graphs<br>- Draw more complex quadratic graphs |

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| | - Interpret quadratic graphs<br>- Interpret reciprocal and exponential graphs<br>- Draw cubic graphs (E)<br>- Interpret cubic graphs (E)<br>- Interpret roots, intercepts and turning points (E) |
| 6 | **Probability** |
| 7 | - Identify and represent sets<br>- Intersection of a set<br>- Union of a set<br>- Complement of a set (E)<br>- Probability of a single event<br>- Use diagrams to work out probabilities<br>- Relative frequency<br>- Expected outcomes<br>- Independent events<br>- Probabilities from Venn diagrams |
| 8 | **Transformations** |
| 9 | - Enlargement (positive scale factor)<br>- Enlargement from a point (positive scale factor)<br>- Enlargement (fractional scale factor)<br>- Enlargement (negative scale factor) (E)<br>- Describe an enlargement<br>- Rotation about a point<br>- Describe a rotation<br>- Translation<br>- Describe a translation<br>- Reflection<br>- Find the result of a series of transformations (E) |
| 10 | **Simultaneous Equations (Optional block)** |
| 11 | - Use one value to find another<br>- Introduction to simultaneous equation<br>- Solve simultaneous equations using graphs<br>- Solve simultaneous equations (no adjustments)<br>- Manipulating equations<br>- Solve simultaneous equations (adjust one)<br>- Solve simultaneous equations (adjust both) (E)<br>- Solve simultaneous equations by substitution (E)<br><br>**ASSESSMENT WEEK- FCAT Maths end of KS3 Assessment** |
| 12 | **Trigonometry (Optional block)** |
| 13 | - Identify hypotenuse, opposite and adjacent sides<br>- Use the tangent ratio to find unknown side lengths<br>- Use sine and cosine ratios to find unknown side lengths<br>- Use sine, cosine and tangent ratios to find unknown angles<br>- Choose the right method<br>- Key angles in right-angled triangles (E)<br>- Trigonometry in 3-D shapes (E) |
| 14 | **Review and Reteach**<br><br>- Here we allocate a week to reviewing and reteaching in order to reinforce key concepts, address gaps in understanding, and ensure a strong foundation before advancing in the curriculum. |