

| | Good | Strong | High | Exceptional |
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| YEAR 10 HIGHER — AUTUMN 1 Number, Fractions, Bounds, Indices, Standard Form, Surds | <ul style="list-style-type: none"> Carry out the four operations with integers, fractions and decimals Order numbers including negatives and decimals Use rounding to significant figures and decimal places and estimate answers sensibly Recognise square numbers and simple powers Find HCF and LCM using basic methods Apply square roots, cube roots and integer powers correctly Convert between ordinary numbers and standard form | <ul style="list-style-type: none"> Convert between fractions, terminating decimals and recurring decimals Use prime factorisation to find HCF and LCM efficiently Perform calculations in standard form involving multiplication and division without a calculator | <ul style="list-style-type: none"> Use index laws accurately with integers and fractional powers Find and use upper and lower Use upper and lower bounds to solve multi-step contextual problems, including finding maximum and minimum values in compound calculations Simplify surds by factorising and express answers in exact form Justify rounding decisions and explain why exact values are needed in certain problems | <ul style="list-style-type: none"> Manipulate surds algebraically, including rationalising denominators and simplifying using factorisation Apply fractional indices to rewrite surds and evaluate exact values |

What you need to know before this half term

- Use place value for integers and decimals
- Perform the four operations with whole numbers
- Order numbers and understand negative values
- Convert simple fractions and decimals
- Round numbers to a given accuracy
- Recognise square and cube numbers
- Use basic index notation

Career links this half term

Laboratory Scientist

Uses standard form, indices and rounding to record very small measurements and analyse scientific data accurately.

Financial Analyst

Uses fractions, percentages, estimation and standard form to compare financial data and predict business performance.

Tier 3 - Key Vocab

- Prime Factorisation** — Writing a number as a product of its prime factors
- Highest Common Factor (HCF)** — The largest number that divides exactly into two or more numbers
- Lowest Common Multiple (LCM)** — The smallest number that is a multiple of two or more numbers
- Recurring Decimal** — A decimal where one or more digits repeat forever
- Terminating Decimal** — A decimal that ends
- Multiplicative Inverse** — A number that multiplies with another to make 1 (for example, 4 and $\frac{1}{4}$)
- Significant Figures** — Digits in a number that show its level of accuracy
- Error Interval** — The range where the true value lies after rounding
- Upper Bound** — The greatest possible value after rounding
- Lower Bound** — The smallest possible value after rounding
- Index (Power)** — The small number that tells how many times a value is multiplied by itself
- Fractional Index** — A power that represents roots and powers combined
- Standard Form** — Writing numbers as a value between 1 and 10 multiplied by a power of 10
- Surd** — An exact square root that cannot be simplified into a whole number
- Rationalise** — Remove a surd from the denominator of a fraction
- Geometric Progression** — A sequence where each term is multiplied by the same value

| | Good | Strong | High | Exceptional |
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| YEAR 10 HIGHER – AUTUMN 2 Algebra, Graphs, Inequalities, Sequences, Simultaneous Equations | <ul style="list-style-type: none"> Use algebraic notation correctly Substitute values into expressions and formulae Solve simple linear equations Plot coordinates and read values from graphs Generate terms in sequences and recognise patterns Simplify expressions by collecting like terms and expanding brackets Represent inequality solutions on a number line Find nth term rules for linear sequences | <ul style="list-style-type: none"> Solve linear equations including brackets and unknowns on both sides Plot straight line graphs accurately and identify gradient and intercept Solve linear inequalities and represent solution regions correctly | <ul style="list-style-type: none"> Solve simultaneous linear equations using substitution or elimination Find the equation of a straight line from a graph or given information Find equations of straight lines using two points or point–gradient form Solve and represent compound linear inequalities on graphs and number lines Find nth term rules for quadratic sequences using second differences | <ul style="list-style-type: none"> Form and solve simultaneous equations from contextual problems Rearrange and manipulate algebraic expressions, equations and formulae confidently |

What you need to know before this half term

- Use BIDMAS (order of operations) correctly
- Substitute values into expressions and simple formulae
- Solve basic linear equations
- Plot coordinates in the first quadrant
- Expand brackets and collect like terms
- Recognise and continue number patterns and sequences
- Use basic graph skills (plotting straight line graphs and reading values)

Career links this half term

Software Developer

Uses algebra, sequences and logical rules to write code that controls programs and solves problems.

Transport Planner

Uses graphs, simultaneous equations and algebra to model traffic flow and improve transport systems.

Tier 3 - Key Vocab

- Coefficient** — The number multiplied by a variable
- Expression** — A mathematical statement without an equals sign
- Equation** — A mathematical statement showing two expressions are equal
- Gradient** — How steep a line is
- Intercept** — Where a line crosses an axis
- Equation of a Line** — A formula that represents a straight line graph
- Inequality** — A statement showing values are not equal using symbols such as $<$ or \geq
- Solution Set** — All values that satisfy an inequality
- Boundary** — The line or value that separates valid and invalid solutions
- Arithmetic Sequence** — A sequence with a constant difference between terms
- Geometric Sequence** — A sequence with a constant multiplier
- Nth Term** — A formula used to find any term in a sequence
- Simultaneous Equations** — Two equations solved at the same time
- Intersection** — The point where two graphs cross
- Substitution** — Solving by replacing one variable with an expression

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| YEAR 10 HIGHER — SPRING 1 Percentages, Growth & Decay, Ratio & Proportion | <ul style="list-style-type: none"> Calculate percentages of amounts Convert between simple fractions, decimals and percentages Write and simplify basic ratios Use scaling in straightforward ratio questions Convert accurately between fractions, decimals and percentages Calculate percentage change Express one quantity as a percentage of another Simplify ratios and divide quantities into given parts Solve routine proportional problems | <ul style="list-style-type: none"> Calculate percentage increase and decrease using multipliers Find original values after percentage change Solve ratio problems involving part:part and part:whole relationships Divide quantities accurately using ratios in contextual problems Apply proportional reasoning to growth, scaling and financial scenarios | <ul style="list-style-type: none"> Use multipliers and inverse multipliers fluently to calculate percentage change and reverse percentage change in unfamiliar contexts Solve multi-step financial problems involving combined percentage changes (for example successive discounts or depreciation over time) | <ul style="list-style-type: none"> Model compound interest and growth/decay problems algebraically and iteratively, explaining why repeated multiplication is required Solve complex ratio problems involving scaling, unit rate conversion and best value comparisons Link ratio, proportion and linear relationships to explain rates of change and justify proportional reasoning |

What you need to know before this half term

- Convert between fractions, decimals and percentages
- Multiply and divide with decimals accurately
- Use order of operations (BIDMAS)
- Apply basic ratio and proportional reasoning
- Estimate and round answers sensibly
- Use brackets correctly in calculation

Tier 3 - Key Vocab

- Percentage Change** — How much a value increases or decreases compared to the original value
- Multiplier** — A number used to calculate percentage change in one step (for example $\times 1.15$ for a 15% increase)
- Compound Interest** — Interest calculated on the original amount and on previously added interest
- Ratio** — A comparison of two or more quantities showing their relative sizes
- Proportion** — When two ratios are equal
- Multiplicative Relationship** — A relationship where quantities are linked by multiplication, not addition

Career links this half term

Retail Buyer / Merchandiser

Uses percentages and sequences to calculate price changes, predict sales trends and manage profit margins.

Operations Manager

Uses inequalities and numerical limits to manage budgets, staffing levels and production targets efficiently.

| | Good | Strong | High | Exceptional |
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| YEAR 10 HIGHER — SPRING 2 Direct & Inverse Proportion, Perimeter & Area | <ul style="list-style-type: none"> Identify simple proportional relationships Substitute values into formulae Calculate perimeter of basic shapes Find area of rectangles and triangles Use formulae for triangles, trapezia and parallelograms Calculate circumference and area of circles accurately Use correct units and measurement | <ul style="list-style-type: none"> Recognise proportional relationships in context Rearrange simple proportional equations Calculate arc length and sector area Find surface area of prisms and pyramids | <ul style="list-style-type: none"> Write and use equations for direct and inverse proportion Find and interpret the constant of proportionality Identify whether a situation shows direct or inverse proportion and justify their decision using algebraic structure Form and manipulate equations of the form $y = kx$ and $y = k/x$, including rearranging to find unknown values Solve multi-step geometry problems involving composite shapes, sectors and curved surfaces | <ul style="list-style-type: none"> Interpret and sketch graphs of proportional relationships and explain how graph shape reflects the relationship Calculate surface area of complex solids (cones, spheres, composite shapes) including exact answers using π Apply proportional reasoning to arc length, sector area and scale-based geometry problems |

| What you need to know before this half term | Tier 3 - Key Vocab |
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| <ul style="list-style-type: none"> Use ratio and fraction equivalence Apply multiplicative scaling Rearrange simple algebraic expressions Plot and interpret straight line graphs Substitute values into formulae Measure accurately and use correct units Recognise properties of common 2D and 3D shapes | <p>Direct Proportion — When two quantities increase or decrease at the same rate</p> <p>Inverse Proportion — When one quantity increases as the other decreases so their product stays constant</p> <p>Constant of Proportionality — The fixed number that links two proportional quantities in an equation</p> <p>Composite Shape — A shape made from two or more simple shapes</p> <p>Sector — A region of a circle bounded by two radii and an arc</p> <p>Surface Area — The total area of all outer faces and curved surfaces of a 3D shape</p> |

| Career links this half term |
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| <p>Civil Engineering Technician Uses ratio, proportion and angles to scale drawings and measure road, bridge and building layouts accurately.</p> <p>Interior Designer Uses ratio, scale and angles to design room layouts and ensure furniture and features fit correctly.</p> |

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| YEAR 10 HIGHER — SUMMER 1 Angles, Scale Drawings, Bearings, Polygons, Circle Theorems, Quadratics (Part 1) | <ul style="list-style-type: none"> Identify basic angle facts Measure angles accurately Use simple scale factors Expand single brackets Solve basic quadratic equations by factorising Use angle facts in triangles and polygons Calculate bearings from diagrams | <ul style="list-style-type: none"> Measure and interpret scale diagrams Expand brackets and factorise simple quadratics Substitute into and rearrange simple formulae Apply parallel line angle rules and polygon angle sums accurately Solve scale drawing and bearing problems involving distance and direction | <ul style="list-style-type: none"> Deduce unknown angles using multiple geometric rules together, including parallel line relationships and polygon angle sums Use circle theorems to calculate unknown angles and justify reasoning Expand and factorise quadratic expressions correctly Solve quadratic equations using algebraic and graphical methods | <ul style="list-style-type: none"> Construct and explain formal circle theorem proofs, using correct notation and logical sequencing Manipulate quadratic expressions by expanding, factorising (including difference of two squares) and completing the square Rearrange complex formulae involving powers and multiple variables |

What you need to know before this half term

- Identify angle types and properties of basic shapes
- Measure angles using a protractor
- Use parallel and perpendicular line facts
- Apply basic ratio and scaling
- Simplify algebraic expressions
- Expand brackets and solve linear equations
- Substitute values into formulae

Career links this half term

Surveyor (Land/Engineering)

Uses angles, bearings and scale to map land accurately and to plan building or infrastructure projects.

Quantity Surveyor

Uses scale, geometry and quadratics to estimate materials, calculate costs and manage budgets for construction projects.

Tier 3 - Key Vocab

Corresponding Angles — Angles in matching positions on parallel lines that are equal (F angle)

Alternate Angles — Angles on opposite sides of a transversal that are equal when lines are parallel (Z angle)

Co-Interior Angles — Angles inside parallel lines that add to 180° (C angle)

Scale Factor — The number used to enlarge or reduce a shape

Bearing — A direction measured clockwise from North using three figures

Cyclic Quadrilateral — A four-sided shape with all vertices on a circle

Tangent — A straight line that touches a circle at exactly one point

Alternate Segment Theorem — A rule linking the angle between a tangent and chord to the angle in the opposite arc

Binomial — An expression with two terms (for example $x + 3$)

Factorisation — Writing an expression as a product of brackets

Subject (of a Formula) — The variable that is written on its own in a formula

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| YEAR 10 HIGHER — SUMMER 2 Quadratics (Part 2), Pythagoras, Trigonometry, Exam Preparation | <ul style="list-style-type: none"> Substitute values into formulae Use Pythagoras' Theorem for basic triangles Identify the correct trigonometric ratio for a problem | <ul style="list-style-type: none"> Use trigonometric ratios in right-angled triangles Apply Pythagoras' Theorem confidently Distinguish clearly between equations and identities and justify equivalence algebraically | <ul style="list-style-type: none"> Identify intersections between linear and quadratic graphs Solve quadratic inequalities and interpret solutions Solve linear–quadratic simultaneous equations using algebraic and graphical methods Simplify algebraic fractions accurately Use sine, cosine and tangent to calculate unknown sides and angles | <ul style="list-style-type: none"> Solve quadratic inequalities and represent solution regions accurately Construct algebraic proofs showing expressions are equivalent Apply Pythagoras' Theorem and trigonometry in 2D and 3D contexts Use exact trigonometric values and similarity to justify geometric results |

What you need to know before this half term

- Expand and factorise algebraic expressions
- Solve linear and quadratic equations
- Interpret straight line and quadratic graphs
- Simplify algebraic fractions
- Use square roots and powers
- Understand ratio and proportional reasoning
- Label diagrams accurately

Tier 3 - Key Vocab

- Identity** — An equation that is true for all values of the variable
- Equivalence** — When two expressions have the same value even if written differently
- Quadratic Inequality** — An inequality involving a quadratic expression that gives a range of solutions
- Pythagoras' Theorem** — A rule linking the sides of a right-angled triangle
- Trigonometric Ratio** — A relationship between sides and angles in a right-angled triangle (sin, cos, tan)
- Similarity** — When shapes have the same angles and proportional side lengths

Career links this half term

Structural/Civil Engineer

Uses quadratics, trigonometry and Pythagoras to model forces, stresses and design safe structures such as bridges or buildings.

Aerospace Engineer

Uses quadratics and trigonometry to model flight trajectories, design aerodynamics and predict aircraft performance.