



Year 7

Half Term 1: NP1 Place Value & the Number Line and NP2 Addition & Subtraction

Disciplinary knowledge

Identifying place value column headers
Name key angle facts – straight line, around a point, vertically opposite and in a triangle

Procedural knowledge

Writing integers and decimals
Ordering positive integers and decimals
Ordering positive and negative integers and decimals
Multiplying and dividing by powers of 10
Rounding to a given number of decimal places and significant figures
Calculating the midpoint of 2 numbers
Add positive integers and decimals
Subtract positive integers and decimals
Identify zero pairs

Contextual knowledge

Converting between common metric measurements
Calculating the median of values
Calculate the complement of a decimal
Using the inverse of addition as subtraction and vice versa
Using the commutative law of addition
Using the associative laws
Calculate the perimeter of polygons
Calculate missing angles, applying basic angle facts
Calculate the mean of a dataset
Calculate the range of a dataset



Reading like a Mathematician
Subject specific vocabulary
definitions and choral response
Reading reasoning and problem-solving questions



NP1: integer, decimal, units, tens, hundreds, thousands, tenths, hundredths, thousandths, multiply, divide, positive, negative, power of 10, rounding, decimal place, significant figure, midpoint, median
NP2: complement, inverse, operation, commutative, associative, zero pair, perimeter, polygon, straight line, point, vertically opposite, triangle, angle, mean, range



Recall test (at the end of NP1)
End of unit test (covering NP1 and NP2)
Content from this half-term will be included in the mid-year exam



30 minutes of Sparx Maths homework needs to be completed every week

Half Term 2: NP3 Multiplication & Division and NP4 Powers, Roots & Primes Disciplinary knowledge Multiplication tables up to 12x12 Procedural knowledge Mental strategies for multiplication of positive integers Mental strategies for multiplication of positive decimals Formal written strategies for multiplication of positive integers Formal written strategies for multiplication of positive decimals List multiples of numbers Identify the Lowest Common Multiple of numbers using systematic listing Mental strategies for the division of positive integers Mental strategies for the division of positive decimals Formal written strategies for the division of positive integers Formal written strategies for the division of positive decimals List factors of numbers Identify the Highest Common Factor of number using systematic listing Contextual knowledge Apply the commutative law of multiplication Apply the inverse operation of multiplication as division and vice versa Reasoning with multiplication and division Calculate the area of rectangular shapes Calculate the volume of cuboids Apply multiplication and division strategies to money, simple proportion and worded problems		Reading like a Mathematician Subject specific vocabulary definitions and choral response Reading reasoning and problem-solving questions
		Multiplication, positive, integer, decimal, multiple, Lowest Common Multiple, systematic listing, factor, Highest Common Factor, area, volume, rectangular, rectangle, square, cube, cuboid
		Midpoint recall test (midway through NP3) End of unit test (covering NP3) End of recall test (covering NP4) Content from this half-term will be included in the mid-year exam
		30 minutes of Sparx Maths homework needs to be completed every week



Year 8

Half Term 1: NP8 Percentages, Fractions and Decimals

Disciplinary knowledge

Know common conversions between fractions, decimals and percentages

Know that percent means parts per hundred

Identify terminating and recurring decimals

Procedural knowledge

Represent percentages using pictorial representations

Calculate a percentage of an amount

Calculate with percentages greater than 100%

Use decimal multipliers to calculate a percentage of an amount

Express one number as a percentage of another

Calculate percentage increase and decrease

Calculate fractional increase and decrease

Contextual knowledge

Identify and comment on the effect of multiplying y numbers between 0 and 1 compared to numbers greater than 1

Calculate simple interest

Comment on data represented in a pie chart

Reason and problem solve with fractions, decimals and percentages



Reading like a Mathematician
Subject specific vocabulary
definitions and choral response
Reading reasoning and problem-solving questions



NP8: Place value, units, tens, hundreds, thousands, tenths, tens, thousandths, percent, terminating, recurring, fraction, decimal, greater than, increase, decrease, numerator, denominator, decimal multiplier, simple interest, pie chart



Recall test (covering NP8)
Content from this half-term will be included in the mid-year exam



30 minutes of Sparx Maths homework needs to be completed every week

Half Term 1: A1 and A2: Algebraic Thinking and Introduction to Simplifying and Manipulating Algebraic Expressions Disciplinary knowledge Identify variable, term, constant, expression and equation Identify like terms Know the notation of algebra Procedural knowledge Generalise expressions Write using algebraic notation Simplify by collecting like terms Substitute into expressions Solve simple equations Add expressions Subtract expressions Multiply expressions Divide expressions Index laws – multiplying, dividing and raising to a power Contextual knowledge Reason and problem solve with algebra Generate an expression from a context or scenario		Reading like a Mathematician Subject specific vocabulary definitions and choral response Reading reasoning and problem-solving questions
		Variable, constant, operation, expression, term, like term, notation, algebra, equation, substitute,
		Recall test (covering A1) End of unit test (covering A1 and A2) Content from this half-term will be included in the mid-year exam
		30 minutes of Sparx Maths homework needs to be completed every week

Half Term 2: NP9 Estimation

Declarative knowledge

Identify place value of digits
Complete simple calculations on a calculator
Identify powers, indices and roots in questions

Procedural knowledge

Use a calculator effectively
Round numbers to a given degree of accuracy (e.g., number of decimal places or significant figures)
Approximate answers
Estimate the answer to calculations
Identify the lower and upper bound of numbers that have been rounded
Truncate numbers

Contextual knowledge

Use surds as representation of value
Represent rounding as error intervals in inequality notation



Reading like a Mathematician
Subject specific vocabulary
definitions and choral response
Reading reasoning and problem-solving questions



NP9: Round, decimal place, significant figure, lower bound, upper bound, error interval, less than, less than or equal to, equal to, greater than, greater than or equal to, estimate, approximation, surd, truncate



Recall test (covering NP9)
Content from this half-term will be included in the mid-year exam



30 minutes of Sparx Maths homework needs to be completed every week

Half Term 2: GM1 Drawing, Measuring and Constructing

Declarative knowledge

Identify points, lines, rays and segments
Know the shortest distance from a point to a line is perpendicular

Procedural knowledge

Use a ruler to measure lines
Label using geometric notation
Use a protractor to measure angles
Label angles using geometric notation
Categorise angles
Estimate the size of angles
Construct circles and arcs
Construct equilateral triangles and a hexagon
Construct triangles using SSS, SAS, ASA
Construct perpendicular bisectors
Construct perpendicular lines from a point on / to a line
Construct angle bisectors
Construct parallel lines

Contextual knowledge

Construct simple loci – from a point
Construct simple loci – from a fixed distance from a line
Construct simple loci – equidistant from two points
Construct simple loci – equidistant from two lines



Reading like a Mathematician
Subject specific vocabulary
definitions and choral response
Reading reasoning and problem-solving questions



Point, line, ray, segment, perpendicular, notation, angle, acute, obtuse, reflect, right-angle, circle, arc, equilateral triangle, hexagon, SSS (side, side, side), SAS (side, angle, side), ASA (angle, side, angle), perpendicular bisector, angle bisector, parallel lines, loci, equidistant



End of unit exam (covering GM1)
Content from this half-term will be included in the mid-year exam



30 minutes of Sparx Maths homework needs to be completed every week

Half Term 2: A3 Manipulating and Simplifying Expressions 2

Declarative knowledge

Know the distributive law of multiplication

Procedural knowledge

Multiply expressions using the distributive law (expanding single brackets)

Divide expressions

Factorise simple expressions

Multiply two expressions (expanding two brackets)

Contextual knowledge

Simplify by collecting like terms after multiplying expressions

Reason and problem solve with multiplying expressions, dividing expressions and factorising



Reading like a Mathematician
Subject specific vocabulary
definitions and choral response
Reading reasoning and problem-solving questions



Distributive law, multiply, divide, expression, factorise, expanding, simplify, manipulate



End of recall test (covering A3)
Content from this half-term will be included in the mid-year exam



30 minutes of Sparx Maths homework needs to be completed every week



Year 9

Half Term 1: GM1 Drawing and Measuring; NP9 Estimation; A2-4 Manipulating Algebra; SP1-2 Data Disciplinary knowledge Know when to use a protractor and ruler when measuring Know that the shortest length is the perpendicular length Identify terms, constants, variables, expressions and equations Simplify algebraic expressions by collecting like terms Know and define the types of correlation		Reading like a Mathematician Subject specific vocabulary definitions and choral response Reading reasoning and problem-solving questions
Procedural knowledge Use a ruler and protractor effectively to measure length and angles Use a compass to draw circles and arcs Use a compass to construct equilateral triangles and hexagons Construct triangles using SSS, ASA and SAS Construct perpendicular bisectors, perpendicular from a point, angle bisector Round numbers to a given degree of accuracy (number of decimal places or significant figures) Identify the smallest the number could have been before being rounded Identify the largest the number could have been before being rounded Simplifying indices and coefficients when multiplying and dividing, multiplication rule for indices Writing algebraic expressions Expanding two simple binomials Calculate mean, median and mode Construct a scatter graph Represent correlation with a line of best fit Interpret and construct line graphs and tables for time-series data		NP9: round, degree of accuracy, decimal places, significant figures, lower bound, upper bound A2-4: variable, constant, operation, expression, term, expand, factorise, solve SP1: mean, median, mode, graph SP2: variable, univariate data, bivariate, correlation, outlier, line of best fit, interpolation, extrapolation, trend.
Contextual knowledge Represent lower and upper bounds in error intervals Represent error intervals on number lines Estimate the answer to calculations by rounding each number to 1 significant figure (or other degree of accuracy if requested) Writing more complex algebraic expressions Apply equations and problems to contexts, including forming and solving equations in a geometric context Calculate mean, median and mode from frequency tables Calculate mean, median and mode from graphs Compare data sets		Content from this half-term will be included in the mid-year exam
Contextual knowledge Represent lower and upper bounds in error intervals Represent error intervals on number lines Estimate the answer to calculations by rounding each number to 1 significant figure (or other degree of accuracy if requested) Writing more complex algebraic expressions Apply equations and problems to contexts, including forming and solving equations in a geometric context Calculate mean, median and mode from frequency tables Calculate mean, median and mode from graphs Compare data sets		30 minutes of Sparx Maths homework needs to be completed every week

Half Term 2: A5 Formulae; A6 The Cartesian Grid & A7 Introduction to Sequences

Disciplinary knowledge

Recall the formula for speed, distance and time
Recall the formula for density, mass and volume
Recall the formula for pressure, force and area
Define linear

Label the x- and y-axis on the Cartesian grid

Label coordinates

Define quadratic

Identify and recognise linear graphs, quadratic graphs and other graphs

Identify terms in a sequence

Procedural knowledge

Substitute into the speed, distance and time formula

Substitute into the density, mass and volume formula

Substitute into the pressure, force and area formula

Generate sequences from formulae

Rearrange linear formulae

Rearrange non-linear formulae

Plot coordinates on the Cartesian grid

Find the midpoint of a linear segment

Represent number relationships graphically

Read values from the Cartesian grid

Draw graphs of $y=n$ and $x=n$

Find integer gradients

Identify parallel lines from their equation

Continue linear sequences

Calculate the rule for linear sequences

Continue non-linear sequences (geometric and Fibonacci)

Contextual knowledge

Substitute into rearranged linear formulae

Substitute into rearranged non-linear formulae

Use the gradient and y-intercept to generate the equation of a linear graph in the form of $y=mx+c$

Represent sequence rules as nth term

Represent sequences in picture sequences



Reading like a Mathematician
Subject specific vocabulary
definitions and choral response
Reading reasoning and problem-solving questions



A5: Formula, substitution, input, output, function machine, speed, distance, time, density, mass, volume, pressure, formula, area, compound measure, sequence, linear, quadratic, geometric, rearrange, subject

A6: Cartesian, coordinate, quadrant, 2D, vector, midpoint, segment, quadratic, gradient, y-intercept, equation, parallel

A7: nth term, term, sequence, term-to-term, position-to-term, geometric, Fibonacci, difference



Recall test (covering A5 Formula)
End of unit exam (covering A5 Formula and A6 Cartesian grid)
End of unit exam (covering A7 Introduction to Sequences)
Content from this half-term will be included in the mid-year exam



30 minutes of Sparx Maths homework needs to be completed every week



Year 10 Higher

Half Term 1: GM5 Right-angled triangles; GM6 Circles and NP13 Advanced Proportion and Rates of Change

Disciplinary knowledge

Recognise right-angled triangles
Identify right-angles from notation
Recall the trigonometric ratios
Recall the parts of a right-angled triangle (hypotenuse, opposite, adjacent)
Recall Pythagoras's formula
Know the exact values of $\sin\theta$, $\cos\theta$ and $\tan\theta$ for $\theta = 0, 30, 45, 60, 90$
Know and identify the parts of a circle
When to round
Know the different circle theorems
Identify direct proportion problems
Identify inverse proportion problems

Procedural knowledge

Calculate the length of the hypotenuse of a right-angled triangle when knowing the opposite and adjacent lengths using Pythagoras' formula
Calculate the length of a right-angled triangle using trigonometric ratios
Calculate the missing angle of a right-angled triangle using trigonometric ratios
Calculate the circumference of a circle in terms of Pi
Calculate the circumference of a circle and round
Calculate the circumference of semi- and quarter-circles in terms of Pi
Calculate the circumference of semi- and quarter-circles and round
Calculate the area of a circle in terms of Pi
Calculate the area of a circle and round
Calculate the area of semi- and quarter-circles in terms of Pi
Calculate the area of semi- and quarter-circles and round
Calculate the length of an arc
Calculate the area of a sector
Use circle theorems to calculate missing angles
Calculate the original value from a percentage change
Calculate simple interest on an amount
Calculate the direct proportion numerically
Calculate the direct proportion algebraically
Calculate the inverse proportion numerically
Calculate the inverse proportion algebraically



Reading like a Mathematician
Subject specific vocabulary definitions and choral response
Reading reasoning and problem-solving questions



GM5: Pythagoras, hypotenuse, trigonometry, opposite, adjacent, sine (sin), cosine (cos), tangent (tan), theta, angle, side, length
GM6: centre, midpoint, radius, diameter, circumference, tangent, chord, arc, sector, segment, alternate, cyclic quadrilateral, parallel, equal, perpendicular
NP13: reverse, percentage, percent, original value, simple interest, direct proportion, linear proportion, inverse proportion, compound unit, density, mass, volume, speed, distance, time, pressure, area, force, part, whole



Midpoint test for right-angled triangles
End of unit test for right-angled triangles
Midpoint test for circles
End of unit test for circles
Midpoint test for advanced proportion and rates of change
End of unit test for advanced proportion and rates of change

Calculate with compound units – speed, distance, time Calculate with compound units – pressure, area, force Calculate with compound units – density, mass, volume Contextual knowledge Calculate the length of the adjacent or opposite of a right-angled triangle when knowing the other two lengths using Pythagoras’ formula Apply Pythagoras and trigonometry to bearings questions Use method selection to decide whether to use Pythagoras’s formula or trigonometry Identify which circle theorem to use to calculate missing angles Represent the direct proportion graphically Represent the inverse proportion graphically		1 hour of Sparx Maths homework needs to be completed every week
Half Term 2: GM7 Advanced Drawing, Constructing and Measuring and SP4 Continuous Data Disciplinary knowledge Define and identify interior and exterior angles Know the basic angle rules – angles on a straight-line, angles around a point, angles in a triangle, vertically opposite angles, interior and exterior angles sum Know and identify 2D and 3D shapes Define and identify polyhedra Know and use the labelling conventions for 3D shapes Name the three main measures of central tendency Procedural knowledge Convert between 2D and 3D units of measurement Draw sketches of 3D shapes Draw sketches of 3D shapes on isometric paper Represent 3D shapes as their plan and elevation Represent 3D shapes as their nets Identify planes of symmetry in 3D shapes Construct loci from a fixed point Construct loci from a fixed distance from a line Construct loci for equidistant points Construct loci for equidistant lines Calculate the median from list of data or ungrouped frequency table	 	Reading like a Mathematician Subject specific vocabulary definitions and choral response Reading reasoning and problem-solving questions GM7: Interior, exterior, angle, straight-line, point, triangle, vertically opposite, polyhedra, isometric, construction, sketch, plan, elevation, net, plane of symmetry, loci, equidistant, Euler SP4: central tendency, mode, median, mean, continuous data, grouped data, cumulative frequency, boxplot, equal class, unequal class, spread, range, interquartile range, lower quartile, upper quartile

Calculate the mode from list of data or ungrouped frequency table Calculate the mean from list of data or ungrouped frequency table Calculate the median from a grouped frequency table Calculate the mode from a grouped frequency table Calculate the mean from a grouped frequency table Calculate the lower- and upper-quartile Construct boxplots Construct cumulative frequency graphs Contextual knowledge Prove polyhedra by using Euler's formula Use cumulative frequency graphs to construct boxplots Compare data represented in different visual representations		Midpoint test covering advanced drawing, measuring and constructing End of unit test covering advanced drawing, measuring and constructing Midpoint test covering continuous data End of unit test covering continuous data
		1 hour of Sparx Maths homework needs to be completed every week



Year 10 Crossover

Half Term 1: A3-8 Algebra Essentials; NP10 Proportional Reasoning and NP11 Ratio Disciplinary knowledge Know and use the order of operations Recognise common sequences Define and categorise direct and inverse proportion Know and use ratio notation Procedural knowledge Expand a single bracket Factorise into a single bracket Solve equations with the unknown on both sides Form equations from given information Substitute values into a formula to find the unknown variable Form formulae from given information Rearrange formula to make a different variable the subject Find the midpoint of a line segment Plot a linear graph using $y = mx + c$ Find the gradient of a line Find the y-intercept of a line Identify parallel lines on a graph Plot quadratic graphs Generate terms of a sequence Calculate the nth term of a sequence Solve linear inequalities Calculate with direct proportion (using ratio tables) Calculate with inverse proportion (using ratio tables) Calculate percentage change Calculate a percentage increase and decrease using decimal multipliers Simplify ratios Simplify ratios into 1:n / n:1 Convert between ratio and fractions to represent proportional value Share into ratios Contextual knowledge Solve equations with brackets Solve equations with fractions Find the equation of a line from the gradient and y-intercept Represent inequalities on a number line Represent inequalities on a graph Calculate best buy problems / value for money Calculate with recipe problems Calculate with exchange rates Calculate parts with given the difference between ratio part values		Reading like a Mathematician Subject specific vocabulary definitions and choral response Reading reasoning and problem-solving questions A3-8 Bracket, expand, factorise, unknown, variable, term, multiply, equation, substitute, formula, rearrange, subject, midpoint, line segment, linear, gradient, y-intercept, parallel, quadratic, sequence, nth term, position, term-to-term rule, NP10: inequality, less than, less than or equal to, equal to, greater than, greater than or equal to, direct proportion, inverse proportion, percentage, increase, decrease, decimal, multiplier NP11: simplify (fully), ratio, part, whole, fraction, numerator, denominator, exchange, currency, ingredient Midpoint test covering advanced drawing, measuring and constructing End of unit test covering advanced drawing, measuring and constructing Midpoint test covering continuous data End of unit test covering continuous data 1 hour of Sparx Maths homework needs to be completed every week
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Half Term 2: GM1-3 Geometry Essentials; NP12 Standard Form and NP13 Advanced Proportion and Rates of Change Disciplinary knowledge Know what a construction is Define triangle Know the four types of triangle Identify perpendicular lines Identify interior and exterior angles Know the interior and exterior angle rule Know the angles in a triangle rules Know the angles in quadrilateral rules, including special quadrilaterals Know the formula to find the total interior angles in a polygon Know the formula to find individual interior angles in a regular polygon Know the formula to calculate the area of rectangles, triangles, parallelograms, rhombuses, trapezia and circles Recognise numbers written in standard form Identify direct proportion problems Identify inverse proportion problems Procedural knowledge Construct triangles Construct line bisects and perpendicular lines Construct simple loci Identify alternate angles in parallel lines Identify corresponding angles in parallel lines Identify co-interior angles in parallel lines Measure bearings Construct bearings Calculate the area of polygons Convert large numbers into standard form Convert large numbers into ordinary form Convert small numbers into standard form Convert small numbers into ordinary form Calculate the original value from a percentage change Calculate simple interest on an amount Calculate the direct proportion numerically Calculate the direct proportion algebraically Calculate the inverse proportion numerically Calculate the inverse proportion algebraically Calculate with compound units – speed, distance, time Calculate with compound units – pressure, area, force Calculate with compound units – density, mass, volume Contextual knowledge Apply the angle rules and properties of triangles Apply the angle rules and properties of quadrilaterals Find missing angles in parallel lines with a transversal line applying the different angle rules Calculate mixed area and perimeter problems		Reading like a Mathematician Subject specific vocabulary definitions and choral response Reading reasoning and problem-solving questions
		Construction, sketch, draw, triangle, equilateral, isosceles, right-angled triangle, scalene, perpendicular, interior, exterior, angle, quadrilateral, parallelogram, rhombus, trapezium (trapezia), rectangle, square, regular, irregular, polygon, circle, bisector, loci, alternate, corresponding, co-interior, bearing, North, significant figure, clockwise, compass, perimeter, compound shape, standard form, scientific form, power of 10, reverse, percentage, percent, original value, simple interest, direct proportion, linear proportion, inverse proportion, compound unit, density, mass, volume, speed, distance, time, pressure, area, force, part, whole
		Recall test covering geometry essentials End of unit test covering angles End of unit test covering area End of unit test covering advanced proportion and rates of change
		1 hour of Sparx Maths homework needs to be completed every week

Calculate the area of compound shapes Convert numbers that are 'nearly' standard form Add and subtract numbers that are written in standard form Represent the direct proportion graphically Represent the inverse proportion graphically		
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Year 10 Foundation

Half Term 1: A2-5 Basic Algebra and GM1-3 Geometry Essentials Disciplinary knowledge Identify terms, expressions, equations, formulae Understand equality and equations Name angles Know the basic angle rules – around a point Know the basic angle rules – on a straight line Know the basic angle rules – vertically opposite Know the basic angle rules – in a triangle Know the basic angle rules – in quadrilaterals Know the properties of quadrilaterals, including special quadrilaterals Know the formulae to calculate the area of rectangular shapes, triangles, circles, parallelograms, rhombuses, trapezia Procedural knowledge Simplify expressions by collecting like terms Substitute values into formulae / equations Solve one-step equations Solve two-step equations Add and subtract expressions Multiply and divide expressions Expand single bracket expressions Factorise single bracket expressions Solve equations with an unknown on both sides Use formulae Rearrange formulae to change the subject Measure angles using mathematical equipment Construct angles Construct triangles Construct angle bisects and line bisects Calculate the area of rectangular shapes Calculate the area of triangles Calculate the area of special quadrilaterals – parallelograms, rhombuses and trapezia Calculate the area of circles Contextual knowledge Write expressions / equations from given scenarios Solve equations with brackets Calculate missing angles in triangles Calculate missing angles in quadrilaterals Calculate missing angles in other polygons Calculate compound area		Reading like a Mathematician Subject specific vocabulary definitions and choral response Reading reasoning and problem-solving questions
		Term, expression, equation, formula, equality, like term, solve, expand, factorise, unknown, subject, angle, triangle, vertically opposite, quadrilateral, parallelogram, rhombus, trapezium, circle, polygon, compound
		Midpoint recall test (covering first part of algebra A2-A3) End of unit test (covering algebra unit A2-A5) Recall test (covering constructions GM1) Recall test (covering polygons and angles GM2) End of unit test (covering constructions, polygons, angles and area GM3)
		1 hour of Sparx Maths homework needs to be completed every week

Half Term 2: SP1-2 Discrete and Bivariate Data; NP8-10 FDP, Proportional Reasoning and Ratio Disciplinary knowledge The data collection cycle Know that the dependent variable is on the x-axis Know that the independent variable is on the y-axis Know what a positive correlation looks like Know what a negative correlation looks like Know what no correlation looks like Know what a strong correlation looks like Know what a weak correlation looks like Know when to round Procedural knowledge Construct pie charts Interpret pie charts Calculate the mean from a list of data Calculate the median from a list of data, including from an even number of data Calculate the mode from a list of data Calculate the spread of data using the range Calculate the mean from a frequency table Calculate the median from a frequency table Calculate the mode from a frequency table Interpret a scatter graph Construct a scatter graph Describe the correlation of data from a scatter graph Identify outliers Interpret time-series graphs Construct time-series graphs Write decimals as fractions Write fraction as decimals Write percentages as decimals or fractions Find a percentage of an amount Work with decimal multipliers Increase numbers by a percentage using a calculator (decimal multiplier) Decrease numbers by a percentage using a calculator (decimal multiplier) Increase numbers by a percentage using non-calculator methods Decrease numbers by a percentage using non-calculator methods Round numbers to a given degree of accuracy (decimal places) Round numbers to a given degree of accuracy (significant figures) Calculate with direct proportion, including the use of ratio tables Calculate with inverse proportion, including the use of ratio tables Contextual knowledge Describe the strength of a correlation on a scatter graph		Reading like a Mathematician Subject specific vocabulary definitions and choral response Reading reasoning and problem-solving questions SP1-2: Data, dependent variable, independent, x-axis, y-axis, positive correlation, negative correlation, no correlation, weak correlation, strong correlation, pie chart, mean, median, mode, range, spread, frequency table, frequency, scatter graph, outlier, time-series graph NP8-10: decimal, units, decimal point, tenth, hundredth, thousandth, fraction, numerator, denominator, percent, multiplier, increase, decrease, rounding, degree of accuracy, focus digit, decider, estimate, decimal, significant figure, direct, inverse, proportion, exchange rate, recipe, ingredient, percent, ratio table, ratio, product Midpoint test covering data and mean, median, mode and range (SP1) End of unit test covering mean, median, mode, range and constructing graphs (SP1 and SP2) Midpoint test covering fraction, decimals and percentages (NP8) End of unit test covering FDP, estimation and proportion (NP9-10) 1 hour of Sparx Maths homework needs to be completed every week
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Estimate the answer to calculations through rounding Calculate with direct proportion problems, including exchange rates, recipe amounts and best value / best buy questions Calculate with worded direct proportion problems Calculate with worded inverse proportion problems		
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Year 11 Higher

Half Term 1: A12-13 Quadratic Graphs and Equations, Advanced Sequences, NP15 Indices and Surds		Reading like a Mathematician Subject specific vocabulary definitions and choral response Reading reasoning and problem-solving questions
Disciplinary knowledge Working with visual representations of arithmetic, quadratic and geometric sequences Completing the number line - knowing about the different sets of numbers (natural, integers, rational, real (incl. irrational)) Power of 0 (recap), negative and fractional indices		A12: parabola, roots, turning point/vertex, y-intercept, quadratic formula, completing the square, factorised, equation, substitution A13: U_n, linear sequence, quadratic sequence, geometric sequence, Fibonacci sequence, recurrence relation, square numbers, cube numbers, triangular numbers, position NP15: natural numbers, integers, rational, real, surds, expanding, binomials, rationalising, denominator, Pythagoras' Theorem, sin, cos tan, sine, cosine, tangent, base.
Procedural knowledge Plotting a quadratic and reading values from a graph; solving quadratics graphically and simple $ax^2=b$ by rearrangement Solving quadratic equations = 0 by factorising, identifying the solutions on a graph Solving quadratic equations = 0 using the quadratic formula, identifying the solutions on a graph Completing the square to find roots. Simple examples where b is even and a = 1. Producing a sketch graph of a quadratic by finding roots, y-intercept and turning points (by symmetry only) Fibonacci sequences - numerical and algebraic Quadratic sequences, including finding the nth term Recurrence relations Multiplication and division with surds Simplifying surds Adding and subtracting surds Expanding binomials featuring surds Rationalising a denominator Addition and subtraction rules with indices (refresher, more complex problems), power of a power (like $[2x^3]^4$) Equations involving indices, including changing the base		Tiering paper completed at the start of the year – to support tiering decisions and identify areas of weakness (lost learning from summer holidays) Midpoint tests completed for each unit and the midpoint End of unit tests completed at the end of each unit
Contextual knowledge Solving quadratics presented not equal to 0, selecting the best method for solving Problems and applications, including Pythagoras and trigonometric exact values, solving quadratics without a calculator, geometric sequences where r is a surd		1 hour of Sparx Maths homework needs to be completed every week
Half Term 2: GM 8 Surface Area and Volume, GM9 Advanced Length and Area, SP6 Sampling and Advanced Data Analysis		Reading like a Mathematician Subject specific vocabulary definitions and choral response Reading reasoning and problem-solving questions
Disciplinary knowledge		

Procedural knowledge Surface area of prisms and cylinders Surface area of spheres, pyramids, cones, composite solids, frustums and other polyhedra Volume of prisms and cylinders Volume of spheres, pyramids, cones, composite solids, frustums and other polyhedra Pythagoras and right-angled trigonometry in 3D Area of a triangle = $\frac{1}{2}ab\sin C$ Sine and cosine rules (including the ambiguous case of the sine rule) Area of a segment Drawing and reading histograms, including questions such as "estimate the number of people between a and b", where a and b are in classes, not on the boundary. Frequency polygons and how they relate to histograms (midpoint of the top of each bar) Finding mean, mode and median from histograms and frequency polygons		GM8: Cuboid, prism, cylinder, sphere, pyramid, cone, frustum, surface area, volume, slanted edge, perpendicular height, square, cube, cubic, similar, congruent, scale factor, nets. GM9: Pythagoras' Theorem, trigonometry, triangle, opposite, adjacent, hypotenuse, substitution, decide, formula, ambiguous, segment. SP6: Population, sample, census, random sampling, systematic sampling, interpolation, histogram, frequency polygon, median and quartiles, box plot
Contextual knowledge		Mock Exams Sat in the main hall. Midpoint tests completed for each unit and the midpoint End of unit tests completed at the end of each unit
Similarity of volume and area - generalising LAV similarity with scale factors and ratios Problems involving length and area, including bearings, 3D and multi-step problems Solving complex problems with mean/mode/median Describe, apply (where appropriate) and analyse sampling techniques - simple random, systematic (and stratified) Describe/infer properties of a population from a sample (by applying statistical analysis to a sample) and know the limitations of sampling, Peterson Capture-Recapture		1 hour of Sparx Maths homework needs to be completed every week



Year 11 Crossover

Half Term 1: GM2 Polygons and Angles, GM3 Area GM6 Circles, NP12 Standard Form, NP13 Advanced Proportion and Rates of Change, A10 Simultaneous Equations,		Reading like a Mathematician Subject specific vocabulary definitions and choral response Reading reasoning and problem-solving questions
Disciplinary knowledge Interior angles in a triangle Interior angles in a quadrilateral Circle parts and properties Large numbers in standard form Small numbers in standard form SI prefixes and engineering form Procedural knowledge Sum of interior angles in polygons Using the properties of quadrilaterals Angles in parallel lines Area of a parallelogram Area of a trapezium Area of circles Circumference of a circle (and semi/quarter circles), in terms of pi and rounded Length of an arc and area of a sector Identifying and using the circle theorems Adding and subtracting in standard form, by converting to normal form and by using distributivity Multiplying and dividing in standard form (using commutativity) Reverse percentages (original value problems) and finding the original value given a percentage of it Simple interest Direct (linear) proportion - first numerically, then graphically, then algebraically Inverse proportion (excluding squares, cubes, roots) - first numerically, then graphically, then algebraically Compound units - density, pressure, speed, value for money (what unit have I found?), including conversions between compound units Ratio problems - combining ratios, finding parts, differences and wholes; mixing ratios with fractions (part/part and part/whole) Solve equations in two variables graphically: know that the points on a line represent the solution set to an equation in two variables, and that the intersection of two lines represents the solution to a pair of simultaneous equations in two variables Find the solution to a pair of simultaneous equations by elimination		GM2/3: Construction, sketch, draw, triangle, equilateral, isosceles, right-angled triangle, scalene, perpendicular, interior, exterior, angle, quadrilateral, parallelogram, rhombus, trapezium (trapezia), rectangle, square, regular, irregular, polygon, circle, bisector, loci, alternate, corresponding, co-interior, bearing, North, significant figure, clockwise, compass, perimeter, compound shape GM6: centre, midpoint, radius, diameter, circumference, tangent, chord, arc, sector, segment, alternate, cyclic quadrilateral, parallel, equal, perpendicular NP12: standard form, scientific form, power of 10 NP13: reverse, percentage, percent, original value, simple interest, direct proportion, linear proportion, inverse proportion, compound unit, density, mass, volume, speed, distance, time, pressure, area, force, part, whole A10: y-intercept, root, satisfy, gradient, parallel, perpendicular, to intersect, simultaneous, region, boundary, negative reciprocal
Contextual knowledge Setting up equations to solve geometric problems		Tiering paper completed at the start of the year – to support tiering decisions and identify areas of weakness (lost learning from summer holidays) Midpoint tests completed for each unit and the midpoint End of unit tests completed at the end of each unit

Bearings Mixed area and perimeter Problems with circumference and area of a circle Converting from 'almost standard' form to standard form Comparing numbers in standard form (and "almost standard" form) Problems and applications, including order of operations Write and solve simultaneous equations from contexts		1 hour of Sparx Maths homework needs to be completed every week
<u>Half Term 2: SP3 Probability Recap, SP4 Continuous Data, SP5 Set Theory and Logic, SP6 Sampling and Advanced Data Analysis, GM7 Drawing and Measuring, NP14 Number Theory</u>		Reading like a Mathematician Subject specific vocabulary definitions and choral response Reading reasoning and problem-solving questions
Disciplinary knowledge Systematic listing (product rule for counting) Record, describe and analyse the frequency of outcomes of simple probability experiments, introduce language of probability Theoretical probability - formalising language and notation, calculating Sum of probabilities of all mutually exclusive events = 1 Thinking logically Representing sets with set notation Representing sets with Venn diagrams Intersections and unions of sets (in notation and on Venn diagrams), subsets Interior and exterior angles in polygons The Fundamental Theorem of Arithmetic Procedural knowledge Generate theoretical sample spaces, including systematic listing of combinations and outcomes, and use these to calculate probabilities Recording outcomes and possibilities using frequency trees, two-way tables and simple Venn diagrams. Use these diagrams to calculate probabilities Measures of central tendency of grouped data - mean, mode and median Graphical representations of continuous and grouped data - cumulative frequency and boxplots (unequal and equal class widths) Measures of spread - interquartile range, including why it is better than the range Solving probability problems using sets Represent the solutions to linear inequalities using set notation Drawing and reading histograms, including questions such as "estimate the number of people between a		SP3: systematic, relative frequency, outcome, event, fair, biased, mutually exclusive, independent, dependent, replacement, without replacement, experimental, theoretical. SP4: Median, mean, mode, range, quantitative, qualitative, discrete, continuous, lower quartile, upper quartile, inter quartile range, class interval, spread, location, sigma, frequency table SP5: Set notation, the universal set, complement, intersection, union, subset, mutually exclusive, independent, dependent, probability. SP6: Population, sample, census, random sampling, systematic sampling, interpolation, histogram, frequency polygon, median and quartiles, box plot GM7: polyhedron, prisms, pyramid, plan, elevation, net, corresponding, alternate, co-interior, exterior, interior, face, vertex, edge. NP14: highest common factor (HCF), lowest common multiple (LCM) the smallest number that is rational number, fraction, integers,

and b'', where a and b are in classes, not on the boundary. Frequency polygons and how they relate to histograms (midpoint of the top of each bar) 2D representations of 3D shapes: constructing and interpreting nets, plans and elevations Converting between 2D and 3D units of measurement Finding HCF/LCM using prime factors Advanced prime factors - square/cube numbers, using numbers given in factorised form Recurring and terminating decimals - prime factor rule for identifying terminating decimals, converting a recurring decimal to a fraction Writing error intervals (recap rounding and truncation); calculations with upper and lower bounds, combining upper and lower bounds, percentage error of these calculations Contextual knowledge Compare data sets through graphs, central tendency and spread Applying the 'AND' and 'OR' rules for independent and mutually exclusive events. Linking to intersections and unions Solving complex problems with mean/mode/median Describe, apply (where appropriate) and analyse sampling techniques - simple random, systematic (and stratified) Finding mean, mode and median from histograms and frequency polygons Problems with angles, including in parallel lines, bearings and polygons, and explaining reasoning HCF/LCM problems		terminating, recurring decimals, truncate, error interval, minimum, maximum, equal to, lower bound, upper bound, variable.
		Mock Exams Sat in the main hall. Midpoint tests completed for each unit and the midpoint End of unit tests completed at the end of each unit
		1 hour of Sparx Maths homework needs to be completed every week



Year 11 Foundation

Half Term 1: GM2 Polygons and Angles, GM3 Area, SP1 Discrete Data, SP2 Bivariant Data, NP8 Percentages, Fractions and Decimals Disciplinary knowledge Angles round points and on straight lines Vertically opposite angles Missing angles in triangles Missing angles in quadrilaterals Properties of quadrilaterals Interior angles in polygons Rectilinear area Area of a parallelogram Area of a triangle Area of a trapezium Area of a circle Procedural knowledge Calculating angles round points and on straight lines Calculating vertically opposite angles Calculating missing angles in triangles Calculating missing angles in quadrilaterals Calculating interior angles in polygons Calculating rectilinear area Calculating area of a parallelogram Calculating area of a triangle Calculating area of a trapezium Calculating area of a circle Collecting data Processing data Drawing and using pie charts Mean Mode, median and range Reading a scatter graph Drawing a scatter graph Correlation Outliers Lines of best fit Time series graphs Writing decimals as fractions Writing fractions as decimals Writing percentages as fractions and decimals Finding a percentage of an amount Decimal multipliers Increasing and decreasing by a percentage Contextual knowledge		Reading like a Mathematician Subject specific vocabulary definitions and choral response Reading reasoning and problem-solving questions
		GM2/3: triangle, equilateral, isosceles, right-angled triangle, scalene, perpendicular, interior, exterior, angle, quadrilateral, parallelogram, rhombus, trapezium (trapezia), rectangle, square, regular, irregular, polygon, circle, bisector, loci, alternate, corresponding, co-interior, bearing, North, significant figure, clockwise, compass, perimeter, compound shape SP1/2: Data, dependent variable, independent, x-axis, y-axis, positive correlation, negative correlation, no correlation, weak correlation, strong correlation, pie chart, mean, median, mode, range, spread, frequency table, frequency, scatter graph, outlier, time-series graph NP8: Place value, units, tens, hundreds, thousands, tenths, tens, thousandths, percent, terminating, recurring, fraction, decimal, greater than, increase, decrease, numerator, denominator, decimal multiplier, simple interest, pie chart
		Tiering paper completed at the start of the year – to support tiering decisions and identify areas of weakness (lost learning from summer holidays) Midpoint tests completed for each unit and the midpoint End of unit tests completed at the end of each unit

Summary statistics from frequency tables and graphs		1 hour of Sparx Maths homework needs to be completed every week
Half Term 2: NP9 Estimation and use of a Calculator, NP10 Proportional Reasoning, A6 The Cartesian Grid, A7 Sequences Disciplinary knowledge Coordinates in all 4 quadrants Horizontal and vertical lines Procedural knowledge Fluent use of the calculator Rounding, truncation and error interval Estimation of calculations Direct proportion Inverse proportion Value for money Exchange rates Decimal multipliers to increase and decrease Plot a linear graph Finding gradient and y intercept from $y=mx+c$ Plot a quadratic graph Find missing numbers in sequences Writing term to term rules Generate terms of a sequence Find the nth term of a sequence Contextual knowledge Picture sequences		Reading like a Mathematician Subject specific vocabulary definitions and choral response Reading reasoning and problem-solving questions
		NP9: Round, decimal place, significant figure, lower bound, upper bound, error interval, less than, less than or equal to, equal to, greater than, greater than or equal to, estimate, approximation, surd, truncate NP10: inequality, less than, less than or equal to, equal to, greater than, greater than or equal to, direct proportion, inverse proportion, percentage, increase, decrease, decimal, multiplier A6: Cartesian, coordinate, quadrant, 2D, vector, midpoint, segment, quadratic, gradient, y-intercept, equation, parallel A7: nth term, term, sequence, term-to-term, position-to-term, geometric, Fibonacci, difference
		Mock Exams Sat in the main hall. Midpoint tests completed for each unit and the midpoint End of unit tests completed at the end of each unit
		1 hour of Sparx Maths homework needs to be completed every week