CAM Trust Mathematics Department

This document outlines the main activities you will complete this year. Use this as a guide to prepare for lessons or check your understanding.

D scheme

Learning log 2023/24

Name:	
Maths teacher(s):	
Maths group:	

I will:

- work to the best of my ability, showing all my workings
- complete my homework to a good standard by the deadline set
- show tenacity when solving problems
- always have the correct equipment for all lessons

Signed:

……

The Mathematics Department will:

- help you develop fluency in mathematical concepts
- help you develop your mathematical communication and reasoning
- help you develop problem solving skills
- set appropriate homework
- regularly assess your progress
- give you regular feedback and let you know what else you need to do to maintain or increase your progress

Signed:

Maths Department

Sparx Maths

Online homework tasks will be set at www.sparxmaths.com
You will use your school log-in details.

Use this space to keep track of your Sparx XP-level:

XP level	

Every lesson you will need to bring this equipment:

- exercise book
- learning log
- scientific calculator
- black pen × 2
- pencil × 2
- ruler
- eraser
- pencil sharpener
- highlighter

When advised, you will also need to bring:

- protractor
- pair of compasses

Optionally:

- colouring pencils

	HW		Objectives Term 1 Autumn	Sparx (KS4)
DNum1	—		Know the squares of integers from 1x1 up to 15 × 15 and the corresponding square roots	U851
			Know the cubes of 2, 3, 4, 5 and 10 and the related cube roots	
			Recognise other powers of 2, 3, 4, 5 and 10	
			Understand what it means to raise something to the power of 0 or 1	
			Work out square roots by estimating or using a calculator	
			Know how to multiply and divide powers of a number, eg $10^3 \times 10^4 = 10^{3+4} = 10^7$; $10^{15} \div 10^{11} = 10^{15-11} = 10^4$	U235
			Find a power of a power, eg $(10^3)^4 = 10^{3\times4} = 10^{12}$	
			Use the index rules in algebra	U662
			Find the Lowest Common denominator (LCM) and highest common factor (HCF) from prime factors	U250
			Use given calculations to work out related calculations using powers of 10	U735
			Multiply or divide a decimal by a decimal	U293, U868
		power, indices, index, BIDMAS, square, square root, cube, cube root, integer, prime, lowest common multiple, LCM, product of prime factors, common factor, highest common factor, HCF		
DAlg1	—		Form expressions in contexts such as area	U613
			Simplify expressions with brackets, eg $3 - 2(4x - 1)$; $5(2x + 3) - (7x - 1)$	U179
			Factorise an expression into a number × a bracket or a letter × a bracket, eg $3a^2 + ab = a(3a + b)$	U365
			Work out algebraic expressions in the right order (BIDMAS)	U976
			Simplify expressions that have powers in them, eg $3abc \times 2bc^2$	U613, U103
			Substitute into expressions and formulae with negative and decimal values	
			Understand how to use function notation, eg $f(x)$ and substitute numbers into a function	U637
			Explore simple proofs	U582
		brackets, factor, common factor, factorise, expression, algebraic, BIDMAS, simplify, collect like terms, term, linear term, index notation, substitute		
DGeom1	—		Understand and use Pythagoras' theorem to find missing lengths in a right-angled triangle	U385
			Construct an angle bisector	U787
			Construct the perpendicular bisector of a line, the perpendicular from a point to a line, and the perpendicular from a point on a line	U245
			Understand the meaning of locus and solve problems on loci	U820
			Use SAS, ASA, SSS, and RHS to construct triangles and to demonstrate that two triangles are congruent	U187
		square, area, Pythagoras' theorem, theorem, hypotenuse, right-angled triangle, Pythagorean triple, surd, perpendicular, pair of compasses, construction, angle bisector, perpendicular bisector 3D shape, cuboid, prism, pyramid, tetrahedron, polyhedron, polyhedra, net, locus, loci, circle, radius, circumference, diameter, centre, chord, segment, sector, tangent, arc		
DData1	—		Write a hypothesis to compare two variables	
			Draw and interpret a scatter graph	U199, U277
			Explain positive, negative, strong, weak and no correlation	
			Draw and use a line of best fit where appropriate	U128
			Know the terms extrapolation, interpolation, correlation and causation.	
		hypothesis, scatter graph, qualitative data, quantitative data, qualitative data, discrete data, continuous data, data collection sheet, grouped data, non-response, bivariate data, axis, axes, variable, scale, correlation, positive correlation, negative correlation, strong correlation, weak correlation, causality, line of best fit, interpolation, extrapolation		

Number	Algebra	Geometry	Data	Revision	Total	
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	HW		Objectives Term 2 Spring	Sparx (KS4)
DNum2	—		Round to any number of significant figures	U731, U965
			Truncate a number to any number of decimal digits	U108
			Do a multi-step calculation in the right order, with or without a calculator (BIDMAS)	U976
			Explain how to find and use these functions on a calculator and read the display: Using = and ANS Brackets π (Pi) Fractions Square roots Squaring Cube Brackets Negative numbers Powers Cube root Time	U926
			Explain why not to round off an answer until the end, and use an appropriate degree of accuracy.	
			Find upper and lower bounds of measurements	U657
		calculator, estimate, evaluate, degree of accuracy, decimal place, brackets, index, square roots, reciprocal, fraction, rounding, accuracy, degree of accuracy, BIDMAS, estimate, accuracy, rounding, significant figures, decimal places, upper/lower bound, error, maximum and minimum, truncation, truncate		
DAlg2	—		Solve equations with brackets and negatives. For example: $9(3x + 1) + 4(3x - 2) = 7x$	U325
			Solve equations involving fractions. For example $\frac{2x+1}{3} = \frac{7x-2}{7}$	U870
			Show inequalities on a number line	U509
			Solve inequalities algebraically	U759, U738
			Give integer solutions to inequalities	U759
		solve, inequality, solution set, integer, number line, construct an equation		
DGeom2	—		Use Pythagoras' theorem to work out the perimeter of a right-angled or isosceles triangle or a compound shape	U385
			Find the area of a rectangle, triangle, parallelogram, trapezium, circle, semi-circle or quarter-circle	U945, U424, U265, U950
			Find the surface area of prisms including cylinders	U259, U464
			Calculate the volume of prisms including cylinders	U174, U915
			Work out missing sides of a prism if I know the volume	
			Understand and calculate density of a prism	U910
		prism, cuboid, cylinder, triangular prism, volume, cross section, area, perimeter, square centimetre, centimetre, cubic centimetre, density, volume, mass, weight, net, area, surface area		
DData2	—		Group discrete and continuous data in a table	U120
			Make a sensible decision about class intervals	U312
			Find the modal group from a grouped frequency table	U569
			Find the median for grouped data	
			Find the estimated mean for grouped data	
		discrete/continuous, grouped/ungrouped, groups/class intervals, modal class, class containing median, estimate of the mean		

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	HW		Objectives Term 3 Summer	Sparx (KS4)
DNum3	—		Understand and use reciprocals	
			Divide a whole number or a fraction by a fraction	U544, U538
			Move between fractions, decimals and percentages and use them appropriately in calculations	U888
			of, integer, unit fraction, common denominator, lowest common multiple (LCM), prime factor decomposition, cancel, common factor, reciprocal, inverse, fraction, integer, division, divisor, FDP loop, fraction, decimal, percentage, place value, long division, proportion	
			Write a sequence if I'm told the nth term rule	U680
			Find the nth term rule for a sequence	U498
DAlg3	—		Use a flowchart to generate a sequence	
			Recognise the links between a rule for a sequence expressed in words, symbols, in a table of values or on a graph.	
			Draw tables and graphs for equations of the form $y = mx + c$	U741
			Explain what a gradient and an intercept is and how they connect to $y = mx + c$	U669
			Match straight line graphs with their equations	U315
			Draw graphs of the form $ax + by = c$	
			Rearrange an equation of the form $ax + by = c$ into $y = mx + c$	
			Plot other graphs (including quadratic, cubic, exponential and reciprocal) by first creating a table of values.	U989
			Find approximate values and solutions using graphs	
			Match up tables of values, equations, graphs and descriptions	U652
			linear/arithmetic sequence/progression, nth term, position-to-term rule, general, generalisation, specific, specialisation, common difference, term, term-to-term rule, constant, variable, triangular /square numbers, Fibonacci, Pascal's triangle, flow chart, spreadsheet	
DRatio3	—		Increase or decrease by a percentage by using a single multiplication	U671
			Find the percentage change	U278, U773
			Work out the original amount if I am told the increased or decreased amount and the percentage change	U286
			Understand and calculate simple and compound interest	U533, U332
			Calculate repeated percentage changes (eg interest rates or depreciation) using the power key on a calculator	
			Express one number as a fraction of another, where the fraction is greater than one (eg 12 is $\frac{6}{5}$ of 10)	
			Convert between fractions, decimals and percentages and be able to compare them	U888
			Convert from ratios to decimals and percentages	U176
			Understand inverse proportion and use graphs to represent problems	U138
			Work with direct and indirect proportion	U721, U357
			percentage, increase/decrease, reverse percentage, decimal multiplier, simple interest, compound interest	
DGeom3	—		Reflect a shape in a given line of reflection, and know that corresponding points on the image will be the same perpendicular distance from the line of reflection as they are on the object	U799
			Rotate a shape given the centre of rotation, angle and direction of rotation	U696
			Enlarge a shape given a centre of enlargement and positive integer or fractional scale factor	U519, U134
			Given a shape and its enlargement, determine the centre of enlargement and the scale factor	
			Translate a shape described in words or using a vector	U196
			Describe fully the single transformation which maps the object to the image	
			Know what changes and what stays the same when objects are transformed	
			Calculate the sum (resultant) and difference of two column vectors and the scalar multiple of a vector and know how to use a diagram to represent vectors	U632, U903, U564, U660

		perpendicular, rotation, order, centre of rotation, enlargement, ratio, scale factor, object, image, centre of enlargement, translation, vector, column vector, transformation		
DData3	—		Understand basic probability notation such as P(A) and P(A')	U510
			Estimate probability from relative frequency	U580
			Understand that repeating an experiment more times is likely to give a more accurate estimate of probability	U166
			Use a two way-table, frequency tree, probability tree or Venn diagram to organise results and calculate the probability for combined events	U981, U280, U558, U476
		experimental probability, relative frequency, theoretical probability, event, outcome, experiment, bias, prediction		

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