



**MVC  
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

**Name:**

**Maths teacher(s):**

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:

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The MVC 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:

*MVC Maths Department*



Online tasks are usually set on [www.hegartymaths.com](http://www.hegartymaths.com)

To access this site you need to enter your name, date of birth and then set your own password. If you have forgotten your password please contact your maths teacher via email.

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
- glue stick

When advised, you will also need to bring:

- protractor
- pair of compasses
- colouring pencils

Optionally:

- colouring pencils

	HW	Objectives Autumn	Hegarty Tasks
DNum1	—	Know the squares of integers from 1x1 up to 15 × 15 and the corresponding square roots	99/101
		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	121
		Understand what it means to raise something to the power of 0 or 1	103
		Work out square roots by estimating or using a calculator	
		Know how to multiply and divide powers of a number, eg $10^3 \times 10^4 = 10^{3+4} = 10^7$ ; $10^{15} \div 10^{11} = 10^{15-11} = 10^4$	105/106
		Find a power of a power, eg $(10^3)^4 = 10^{3 \times 4} = 10^{12}$	107
		Use the index rules in algebra	110
		Find the Lowest Common denominator (LCM) and highest common factor (HCF) from prime factors	32/35
		Use given calculations to work out related calculations using powers of 10	135/136
		Multiply or divide a decimal by a decimal	48/50
		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	176
		Simplify expressions with brackets, eg $3 - 2(4x - 1)$ ; $5(2x + 3) - (7x - 1)$	161
		Factorise an expression into a number × a bracket or a letter × a bracket, eg $3a^2 + ab = a(3a + b)$	168/169
		Work out algebraic expressions in the right order (BIDMAS)	150
		Simplify expressions that have powers in them, eg $3abc \times 2bc^2$	158/159
		Substitute into expressions and formulae with negative and decimal values	787
		Understand how to use function notation, eg $f(x)$ and substitute numbers into a function	288
		Explore simple proofs	325
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	498/499
		Construct an angle bisector	661
		Construct the perpendicular bisector of a line, the perpendicular from a point to a line, and the perpendicular from a point on a line	660/669
		Understand the meaning of locus and solve problems on loci	674-678
		Use SAS, ASA, SSS, and RHS to construct triangles and to demonstrate that two triangles are congruent	683
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	453
		Explain positive, negative, strong, weak and no correlation	
		Draw and use a line of best fit where appropriate	454
		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	
/	/	/	/	/	/	%

	HW	Objectives Spring	Hegarty Tasks
DNum2	—	Round to any number of significant figures	130
		Truncate a number to any number of decimal digits	134
		Do a multi-step calculation in the right order, with or without a calculator (BIDMAS)	120/150
		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	129
		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	
		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: $9(3x + 1) + 4(3x - 2) = 7x$	182/179
		Solve equations involving fractions. For example $\frac{2x+1}{3} = \frac{7x-2}{7}$	180/186
		Show inequalities on a number line	265/266
		Solve inequalities algebraically	269/270
		Give integer solutions to inequalities	267/268
		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	501
		Find the area of a rectangle, triangle, parallelogram, trapezium, circle, semi-circle or quarter-circle	557/559 556 539-543
		Find the surface area of prisms including cylinders	585/586
		Calculate the volume of prisms including cylinders	571-573
		Work out missing sides of a prism if I know the volume	
		Understand and calculate density of a prism	725/726
		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	
		Make a sensible decision about class intervals	
		Find the modal group from a grouped frequency table	415/416
		Find the median for grouped data	417/418
		Find the estimated mean for grouped data	
		discrete/continuous, grouped/ungrouped, groups/class intervals, modal class, class containing median, estimate of the mean	

Number	Algebra	Geometry	Data	Revision	Total	
/	/	/	/	/	/	%

	HW	Objectives Summer	Hegarty
DNum3	—	Multiply a fraction by a fraction and calculate fractions of integers	67/68
		Understand and use reciprocals	71
		Divide a whole number or a fraction by a fraction	70
		Move between fractions, decimals and percentages and use them appropriately in calculations	149
		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	
DAlg3	—	Write a sequence if I'm told the $n$ th term rule	
		Find the $n$ th term rule for a sequence	198
		Know and work with other sequences including geometric progressions, the Fibonacci sequence, quadratic sequences and triangular numbers.	261 263/264
		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.	196 197
		Plot and interpret non-linear graphs	
		Solve problems involving midpoints of line segments	200
		linear/arithmetic sequence/progression, $n$ th 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 one multiplication	89
		Find the percentage change	97
		Work out the original if I am told the increased or decreased amount	96
		Understand and calculate simple and compound interest	93/94
		Calculate repeated percentage changes eg interest rates or depreciation using the power key on a calculator	
		Work with direct and indirect proportion	339/342
		percentage, increase/decrease, reverse percentage, decimal multiplier, simple interest, compound interest	
DGeom3	—	Rotate a shape given the centre of rotation, angle and direction of rotation	648/649
		Reflect a shape given the line of reflection	639/640
		Enlarge a shape using a centre of enlargement and positive integer or fractional scale factor	641 642/643
		Translate a shape using words or using a vector	637/638
		Describe fully the single transformation which maps the object to the image	650/651
		Know what changes and what stays the same when objects are transformed	655
		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	625
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 $P(A')$	353
		Estimate probability from relative frequency	356
		Understand that repeating an experiment more times is likely to give a more accurate estimate of probability	357
		Use a two way-table, frequency tree, probability tree or Venn diagram to organise results and calculate the probability for combined events	424/369 363/383
		experimental probability, relative frequency, theoretical probability, event, outcome, experiment, bias, prediction	

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