

Edexcel Linear GCSE – Higher Scheme of Work

N1 – BIDMAS (including use of calculator), prime factors, reciprocals and indices (12 - 15 lessons)

NB – It may be necessary to ensure that students are confident with factors, multiples, primes, squares, cubes, roots etc. before starting the topics listed below.

NB – Negative numbers do not appear in the specification or in the scheme of work as a stand-alone topic.

However confidence with negative numbers is crucial to many of the topics at Higher GCSE.

Grade	Topics	Example questions / content
D/C 3-5	- BIDMAS - Calculator methods - Prime factor decomposition - Indices and roots - Index laws (no algebra) - Reciprocals	- Use BIDMAS to work out: $4 \times 11 - 7 / 2 + 8 \times 3 / 4 \times 3 + 5 \times 8 / 5 + 12 \div 6 + 3 / (2 + 9) \times 3 / 3 \times (4 + 5) - 7 / (4 + 3)^2 \times 2$ etc. - Use BIDMAS to place brackets to these calculations correct: $5 \times 2 + 1 = 15 / 20 + 8 \div 2 - 7 = 17$ etc. - Use a calculator to work out: $3.2 \times (2.8 - 1.05) / 1.8^3 + 4.7^3 / \frac{24.7 - (3.2 + 1.09)^2}{2.78^2 + 12.9 \times 3}$ etc. - Use prime factor decomposition (factor trees) to express numbers as a product of their prime factors. - Use prime factor decomposition (factor trees) to find the HCF or LCM of two or more numbers. - List / know how to work out square numbers up to 12^2 without a calculator. - Know how to work out the first few cube numbers without a calculator. - List / know how to work out square roots up to $\sqrt{144}$ without a calculator. NB Students should get used to giving positive AND negative square roots as solutions. - Know how to work out the first few cube roots without a calculator. - Evaluate (without a calculator): $2^4 / 10^5 / 1^8$ etc. - Find the value of n in these equations: $2^n = 64 / 3^n = 81 / 10^n = 10000$ - Know how to work out any number with a positive integer index with a calculator. - Simplify the following expressions: $4^2 \times 4^5 / 6^4 \times 6^{-5} / 7^8 \div 7^5 / 8^2 \div 8^6 / \frac{3^7 \times 3^4}{3^5} / (2^3)^2 / (4^{-2})^4$ etc. - Understand that when a number is multiplied by its reciprocal the answer is always 1 and that for any number n the reciprocal is $\frac{1}{n}$. - Work out the reciprocal of $4 / \frac{1}{3} / 0.2 / \frac{5}{8}$ etc.
B/A 5-7	- Further index laws - Standard form	- Understand the meaning of and evaluate $7^0 / 5^1 / 9^{\frac{1}{2}} / 8^{\frac{3}{4}} / 3^{-1} / 5^{-3} / 8^{\frac{3}{5}} / 4^{-\frac{1}{2}}$ etc. - Find the value of n in these equations: $2^n = \frac{1}{2} / \frac{1}{2}^n = \frac{1}{4} / 27^n = 9$ etc. - Simplify expressions including negative and fractional indices. - Write large and small numbers in standard form. - Convert numbers from standard form to 'ordinary' numbers. - Multiply and divide calculations in standard form without a calculator. - Use a calculator to work out more difficult standard form calculations.
Resources / ideas Bob says "The product of any two numbers is equal to the product of their HCF and their LCM." Is Bob correct?		

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A1 – Algebraic expressions (12-15 lessons)		
Grade	Topics	Example questions
D/C 3-5	- Simplifying algebraic expressions - Writing expressions - Expanding single brackets and simplifying - Factorising into single brackets - Substitution Functions - Index laws using algebra - Changing the subject of a formula	- Simplify: $2 \times a / 5 \times b / c \times d / e \times e / 10f \div 2 / 3 \times 4 \times g \times h$ - Simplify: $a + a + a / 3b + 5b / 5c + 2d + 3c + d / 6e + 2f - 4e + 3f / 2g - h - 5g + 4h$ - If rulers cost 12p and pencils cost 8p, write an expression for the total cost of x rulers and y pencils. - Write expressions for perimeters of rectangles, triangles etc. given expressions for the individual sides. - Expand: $2(a + 4) / 3(b - 6) / c(c + 3) / d(d^2 + 4d)$ - Expand and simplify: $3(x + 2) + 5(2x - 1) / 4(2x + 1) - 3(x + 5)$ - Factorise: $4a + 8 / 5b - 20 / c^2 - 2c$ - What is the value of $a^2 + 2b$ when $a = 4$ and $b = -2$? - What is the value of $\frac{c(d + 1)}{2}$ when $c = 3$ and $d = 6$? $f(x) = 2x^2 + 7$. Find the value of: $f(3)/f(-8)/f(\sqrt{3})$ - Simplify the following expressions: $e^2 \times e^5 / 2f^4 \times 3f^5 / g^8 \div g^5 / 8h^2 \div 2h^6 / i^7 \times i^4 / (k^3)^2 / (2m^{-2})^4$ etc. {functions to be moved to later unit – Functions of Graphs potential} - Make t the subject : $3t = 8 / t + y = 6 / a + bt = 8 / \frac{3t + b}{p} = y$
B/A 6-7	- Composite functions - More difficult factorising into single brackets - Expanding double brackets - Factorising into double brackets - Further expressions - The difference of two squares - Changing the subject through factorising - Inverse functions	- If $f(x)$ is $3x + 4$ and $g(x)$ is $2x - 7$ what is $fg(3)$, $gf(-2)$, $ff(4)$ etc. - Factorise: $4x^2 + 6xy$ - Expand: $(x + 3)(x + 5) / (x - 2)(x + 4) / (x - 6)(x - 1) / (x + 7)(x - 7) / (2x + 3)(x - 4)$ - Factorise: $x^2 + 5x + 6 / x^2 - x - 12 / 2x^2 - 4x - 16 / 7x^2 - 62x + 48$ - Show that $(n - 1)^2 = n(n - 5) + 3(n + 1) - 2$ - Factorise: $x^2 - 16 / 4x^2 - 81 / 25a^2 - 9b^2 / 2v^2 - 5w^2$ - Make t the subject : $k = 5n^2 + 3 / 3a + bt = 7 - 9t / 3 + 5t = \frac{7 - at}{6} / \frac{3t + 7}{bt + a} = 8$ - Find the inverse of: $f(x) = 4x - 5 / f(x) = \frac{x - 7}{6} / f(x) = \frac{3}{x} + 5$ (A good time to revisit functions) Students must recognise the $f^{-1}(x)$ stands for the inverse of $f(x)$. It is also worth showing and proving that $f(4) = 6$ then $f^{-1}(6) = 4$
A* 8/9	Algebraic proof	Use algebra to prove mathematical statements such as: <i>The sum of any even number and any odd number is always odd.</i> <i>The sum of any 3 consecutive numbers is always a multiple of 3.</i>

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		<i>The product of any two odd numbers is always odd.</i>
Resources / ideas		

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G1 – Lines, angles, bearings and circle theorems (12 - 15 lessons)		
Grade	Topics	Example questions
D/C 3-5	- Geometric notation - Angles in parallel lines - Angles in polygons - Bearings - Plans + Elevations - Loci & Bisectors - Area	- Know how to label and interpret when lines are parallel or equal, angles are equal, and know and apply all properties to different types of triangles and quadrilaterals - Use knowledge of alternate, corresponding, co-interior/allied/supplementary angles and other angles facts to calculate missing angles. NB Students need to be able to give Mathematical reasons for their working out e.g. “Corresponding angles are equal.” “Alternate angles are equal.” NB Co-interior / angles are not included in the text book but should be taught here. SUPPLEMENTARY IS NO MORE Know and explain the keywords to gain all reason marks for angles on parallel lines – talk to PWH if unsure - Understand standard convention for labelling sides and angles on a polygon - Use knowledge of the angle properties of quadrilaterals to calculate missing angles. - Find the interior or exterior angles of any regular polygon. - Recall the key facts about bearings: always 3 digits e.g. 005° / 048°, always measured clockwise from North which is 000° / importance of the word ‘from’ in the question. - Measure and (more likely) work out bearings from diagrams. NB Given that all North lines are parallel, it is likely that students will need to apply their knowledge of angles in parallel lines. - Draw the plan, front and side elevations of a 3d shape. - Sketch (or possibly make an accurate drawing) of a 3d shape from its plan, front and side elevations. - Construct perpendicular bisectors (including from a point to a line) and angle bisectors using a compass and a straight edge. - Draw the loci of points which are a certain distance from another point. - Draw the loci of points which are a certain distance from a line. - Draw the loci of points which are equidistant from... (requiring a perpendicular or angle bisector). Show loci and/or shade regions within shapes (which may well be scale drawings of gardens, fields etc.). - Work out the area of a triangle when given the base and the height. NB Show why the formula is half of the formula for a rectangle. - Work out the area of a parallelogram and a trapezium. - Work out missing lengths from triangles, parallelograms and trapeziums when given the area.

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	• Surface area • Volume	• Work out the area of an L shape or a C shape made up of rectangles or a compound shape made from a rectangle and a triangle. • Recognise or draw the net of a cuboid or a triangular prism. • Work out the surface area of a cuboid or a triangular prism from a net or a 3D drawing. • Work out the volume of a cube, cuboid, triangular prism or cylinder. • Work out the volume of any prism when given the area of the cross-section. • Convert between different units for area and volume e.g. m^2 to cm^2.
B/A 6-7	• Similar shapes	• Calculate the missing lengths of the sides of similar 2d shapes (usually triangles). <i>NB Ensure that students have seen a range of different diagrams.</i>
A* 8	• Similar shapes – area and volume scale factor • Congruence	• Calculate the missing lengths, area or volumes of 2d or 3d shapes using area and volume scale factor. <i>NB Students need to be able to handle a range of calculations including working out the area when given the volume.</i> • Use the ‘conditions of congruence’ to prove that two shapes (usually triangles) are congruent – SSS / SAS / AAS / RHS – using accurate notation and clear explanations.

Resources / ideas

USE ANGLES ON A TRIANGLE TO PROVE ANGLES ON A STRAIGHT LINE

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A2 – Sequences and graphs (15 - 20 lessons)		
NB – It is important that students understand the links between sequences and graphs.		
Grade	Topics	Example questions
D/C 3-5	- Number patterns - Generating sequences - Finding the n^{th} term of linear sequences - Finding the mid-point of a line segment - Gradients and intercepts $y = mx + c$ - Real-life graphs	- Write the next two terms in this sequence: 4, 9, 14, 19, __, __ - Fill in the missing numbers in this sequence: 3, 12, __, 30, __ - Recognise and know how triangular, square and cubic numbers, Fibonacci type sequences, quadratic and geometric sequences - Write the first five terms of these sequences: square numbers / $T_n = 8n + 2$ / $T_n = 10 - 2n$ / $T_n = 2n^2 - 1$ / $T_n = \frac{1}{n}$ NB Higher sets can explore further sequences e.g. $T_n = (n + 1)(n + 2)$ / $T_n = 2^n$ / $T_n = \frac{n + 1}{n}$ - Find an expression for the n^{th} term of these sequences: 4, 9, 14, 19... / 10, 12, 14, 16... / 1, 1.5, 2, 2.5... / 8, 5, 2, -1... Work out the 50th / 100th term of the sequence. NB Sequences with diagrams should also be included. NB Finding the n^{th} term of a quadratic sequence does not seem to be in the new GCSE. Please let JDN know if you discover otherwise! - Find the mid-point of a line segment when given a diagram or the co-ordinates of both ends of the line segment. - Find the gradient of a straight line on a graph or between two co-ordinate points. - Identify the y-intercept of a line. NB This topic will often be tested using real-life or conversion graphs (see pp.246-248 of text book). - Draw linear graphs with positive and negative, integer and fractional gradients e.g. $y = 3x + 2$ / $y = -2x + 1$ / $y = \frac{1}{2}x - 3$ etc. - Write the equation of linear graphs with positive and negative, integer and fractional gradients. NB The link between generating co-ordinate pairs and generating sequences should be made. NB Students should also be confident about the lines $y = 3$, $x = -1$, $y = 0$ etc. - Answer a variety of questions related to real-life graphs including distance-time graphs. These questions might include completing a graphs or matching a series of graphs to real-life situations.
B/A 6-7	- Find the n^{th} term of these quadratic sequences - Geometric sequences	- Recognise the n^{th} term of quadratic sequences and sequences involving powers: 2, 5, 10, 17, 26..., /2, 4, 8, 16, - Find the first 5 terms of the geometric sequence: $4 \times 6^{n-1}$, 3×7^n, $2 \times 5^{n-1}$ $3 \times \sqrt{5}^{n-1}$

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	- Finding equations of line segments - Finding equations of parallel lines - Real life graphs - Graphs of quadratic functions	- Find the equation of the line joining: (0,5) to (12,41) / (3,10) to (5,6) - Give the equation of a line parallel to $y = 2x - 1$ / $y = 7 - 4x$ / $y = -\frac{1}{4}x + 5$ - Find the equation of line that is: parallel to $y = -4x + 3$ and passes through (-1, 2) / parallel to $y = \frac{1}{2}x - 3$ and passes through (6,7) NB Students also need to be able to deal with equations of lines that are not written in the form $y = mx + c$. - Use real life graphs to find acceleration or deceleration/velocity/time. (6) - Interpret real life graphs to find Initial/minimum/maximum/final velocity (6) - Interpret and estimate areas under graphs. (Recognise that area under a velocity-time graph represents displacement) - Draw chords to a curve to find areas under a curve and average rates of change by looking at the gradient of the curve - Draw tangents to a curve to apply instantaneous and average rates of change by looking at the gradient. - Complete tables of values and plot graphs of quadratic functions.
A* 8	- Geometric sequences - Finding equations of perpendicular lines - Graphs of cubic functions - Graphs of reciprocal functions - Graphs of exponential functions	- Work out the nth term of the geometric sequence. 3, 6, 12, 24, 48 / 5, 20, 80, 320, 1280 - Find the first 5 terms of geometric sequence where the common ratio is a surd $\sqrt{3} \times 4^n$ / $4 \times \sqrt{3}$ - Give the equation of a line that is perpendicular to: $y = -5x + 2$ / $y = 3x + 5$ / $y = -\frac{2}{3}x - 1$ - Give the equation of the line that is: perpendicular to $y = 2x + 4$ and passes through (3,7) - Find the equation of the perpendicular bisector of the line segment that joins: (3,10) and (7,12) / (2,20) and (5,18) / (-2,7) and (4,-10) - Complete tables of values and plot graphs of cubic functions. - Complete tables of values and plot graphs of reciprocal functions. - Complete tables of values and plot graphs of exponential functions. NB For reciprocal and exponential functions, it is more likely that students will be asked to recognise graphs perhaps by matching them to equations.
Resources / ideas		

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G2 – Transformations (8-10 lessons)	
Topics	Example questions
• Reflection • Rotation • Translation • Combined transformations • Enlargement	• Find the mirror line for given reflections (including giving the equation of a mirror line e.g. x axis / y axis / the line $x = 3$ etc.). • Complete a reflection given an object and a mirror line (including the x axis / y axis / $y = x$ / various horizontal or vertical lines etc.). • Rotate a shape 90° / 180° / 270° clockwise / anti-clockwise around a given point. • Describe a rotation in terms of its angle of rotation and its centre. • Translate an object according to a given vector. • Describe a translation using a vector. • Describe the single transformation that has the same effect as two or more other transformations combined. • Enlarge shapes using positive integer scale factors and a centre of enlargement. • Describe an enlargement in terms of its scale factor and its centre of enlargement.
• More enlargement	• Enlarge shapes using fractional scale factors and a centre of enlargement. • Describe an enlargement in terms of its fractional scale factor and its centre of enlargement.
• Even more enlargement	• Enlarge shapes using negative scale factors and a centre of enlargement. • Describe an enlargement in terms of its negative scale factor and its centre of enlargement.
Resources / ideas	

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A3 – Solving equations 1 (20 lessons)		
NB – It may be necessary to ensure that students are confident with one-step and two-step equations before starting the topics below. NB – It is important that students gain experience of working with negative and non-integer solutions.		
Grade	Topics	Example questions
D/C 3-5	- Solving simple equations - Solving equations with brackets - Solving equations with unknowns on both sides - Solving equations in context - Inequalities on a number line - Solving inequalities - Integer solutions to inequalities - Solving functions - Solving quadratic and cubic equations using trial and improvement	- Solve these equations: $2a + 5 = 13$ / $3b - 4 = 17$ / $13 + 4c = 7$ / $1 - 2d = 9$ - Solve these equations: $2(i + 3) = 12$ / $5(j - 4) = 10$ / $3(2k + 1) = 8$ - Solve these equations: $3m + 2 = 2m + 8$ / $5n - 1 = 3n + 7$ / $p + 4 = 2p - 1$ / $3(q + 2) = q + 10$ a) Find an expression for the perimeter of this triangle. b) The perimeter of the triangle is 34cm. Find the value of x. c) Find the length of the longest side. a) Write an expression for the area of this rectangle. b) The area of the rectangle is 8cm^2. Find the value of y. - Represent inequalities on a number line. - Write down inequalities that are represented on a number line. - Solve inequalities with one variable e.g. $2x + 5 < 1$ / $5x - 3 > 3x + 9$ / $2(x + 3) \leq 11$ etc. - List the integer values which satisfy the following inequalities: $-2 < x \leq 5$ / $-8 \leq 2x < 6$ / $-9 < 2x + 5 \leq 13$ Represent inequalities on a number line. - Write down inequalities that are represented on a number line. - Solve inequalities with one variable e.g. $2x + 5 < 1$ / $5x - 3 > 3x + 9$ / $2(x + 3) \leq 11$ etc. - List the integer values which satisfy the following inequalities: $-2 < x \leq 5$ / $-8 \leq 2x < 6$ / $-9 < 2x + 5 \leq 13$ - Solving functions when you are told the function. e.g. $f(x) = 3x + 4$, $g(x) = 4x - 8$. Solve when $f(x) = 4$ $g(x) = -2$ - The equation $x^3 - 4x = 24$ has a solution between 3 and 4. Use a trial and improvement method to find the solution. Give your answer correct to 1 decimal place. NB Students should use a table to show their working out clearly.
B/A 6-8	Solving equations with fractions	- Solve these equations: $\frac{21}{r} = 7$ / $\frac{15}{s} = \frac{5}{t}$ / $\frac{10}{t} + 7 = 8$ / $\frac{y+1}{3} = \frac{y-1}{4}$ / $\frac{3}{w-1} = \frac{9}{2w-1}$ - Solve these equations: $x^2 + 7x + 12 = 0$ / $x^2 + 10x + 25 = 0$ / $x^2 - 10x + 21 = 0$ / $x^2 - 8x = 0$ / $x^2 = 9x$

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- Solving quadratic equations by factorising - Solving inequalities - Integer solutions to inequalities - Inequalities and regions - Solving quadratic inequalities - Inverse functions - Solving equations using iteration (links in with trial and improvement) - Simultaneous equations - Graphical solutions - Completing the square	$\frac{6}{x-3} = \frac{bt+a}{x-3}$ - Solve inequalities with one variable e.g. $5x - 3 > 3x + 9$ / $3(x + 1) \leq 4(x - 5)$ etc. - List the integer values which satisfy the following inequalities: $-9 < 2x + 5 \leq 13$ / $-1 < \frac{3x-2}{4} < 2$ - Draw graphs to represent inequalities such as $y < 3$ / $x \geq -2$ / $y > x$ etc. - Shade regions on graphs to show the points which satisfy 2 or more inequalities. - Solve $x^2 - 3x - 10 > 0$, $x^2 + 12x + 35 < 0$, $x^2 - 6x + 5 \geq 0$, $x^2 < 3(x+2)$ (7-9) - Represent each solution on a number line $x^2 + 10x - 24 < 0$, $x^2 + 5x + 6 \geq 0$ (7-9) - Verify that $\frac{30}{x-3} > x+4$ for $x = -10$ and $x = 5$ (7-9) - Solving functions involving fractions and composite functions e.g. $f(x) = 4x - 3$ $g(x) = 10 - x$ $h(x) = \frac{3x}{5} - 8$, Solve a) $h(x) = 8$ b) $fg(x) = 4$ c) $gf(x) = 4$ NOTE: Functions can also be quadratic - Find the first four iterations of the iterative formula $X_{n+1} = 3X_n - 2$ with $X_1 = 2$ An approximate solution for the equation $x^3 - 16x + 9 = 0$ can be found using the iterative formula $X_{n+1} = \sqrt[3]{16X_n - 9}$ and an initial value of $x_1 = 4$. a) Find the first six iterations, correct to 5 decimal places. b) Verify that 3.68 is a solution of the equation, correct to 2 decimal places - Solve the following simultaneous equations: $3x + y = 15$ / $x + 5y = 19$ / $x + y = 3$ / $3x + 2y = 19$ $x + y = 7$ $x + 7y = 27$ $3x - y = 17$ $8x - 2y = 58$ - Solve the following simultaneous equations: $2x + y = 8$ / $3x + 2y = 19$ / $2x + 3w = 12$ / $9x + 5y = 15$ $5x + 3y = 12$ $4x - y = 29$ $5x + 4w = 23$ $3x - 2y = -6$ - Form and solve simultaneous equations e.g. Two numbers have a sum of 41 and a difference of 7. Find the numbers. / In an isosceles triangle the largest angle is 30° more than the sum of the other two angles. Work out the angles in the triangle. - Use linear graphs (already drawn) to find the solutions to simultaneous equations. - Draw linear graphs to find the solutions to simultaneous equations. NB Students should have already learned to solve quadratic equations by factorising. However some revision may be a good idea before moving on to completing the square. - Write the following expressions in the form $(x + p)^2 + q$: $x^2 + 4x + 6$ / $x^2 + 8x + 15$ / $x^2 + 5x$ / $x^2 - 4x + 9$ etc. - Write the following expressions in the form $a(x + p)^2 + q$: $2x^2 + 4x + 5$ / $3x^2 - 12x$ / $5x^2 + 30x + 50$ etc. - By completing the square, find the minimum value of the expressions above.
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	Points on a quadratic graph	- Solve the following equations by completing the square: $x^2 - 12x + 20 = 0$ / $x^2 + 2x - 63 = 0$ / $x^2 - 10x = 0$ - Use completing the square to find the turning points(maximum or minimum) on a quadratic curve. - Find the y intercept of a quadratic curve
A/A* 7 -8	- More simultaneous equations - More graphical solutions - Setting up and solving quadratic equations	- Solve the following simultaneous equations: $y = x^2 - 2x$ / $y = x^2 - 1$ / $y = 2x^2$ / $x^2 + y^2 = 16$ $y = x + 4$ $y = 2x - 2$ $y = 9x - 4$ $y = x - 1$ - Use linear and quadratic graphs and graphs of circles (already drawn) to find the solutions to simultaneous equations. - Draw linear and quadratic graphs and graphs of circles to find the solutions to simultaneous equations. - Recognise and use the equation of a circle centred at the origin. - Find the equation of a tangent to a circle at a given point, using the fact that it is perpendicular to the radius. <i>This is a good time to do revision of straight line graphs</i> - Solve worded questions such as: A number and its square are added together. The total is 12. Find the two possible values of the number. / A rectangle has length $2x + 5$ and width $x - 3$. The area of the rectangle = 90cm^2. Show that $2x^2 - x - 105 = 0$ and hence calculate the perimeter of the rectangle. <i>NB This topic was covered in Solving Equations 1 (see above) but some revision may be beneficial.</i>
Resources / ideas The mean of each of the following sets of expressions is equal. What is the value of x? $\begin{array}{cc} 2x - 1 & 7x \\ 5x + 4 & 3x + 2 \\ 11 - 2x & 6x - 4 \end{array}$ $\begin{array}{cc} 3x - 7 & 5x + 8 \\ 13 - x & 12 + 4x \\ & 2(3x + 1) \end{array}$		

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S1 – Collecting, recording and using data (12 - 15 lessons)		
Grade	Topics	Example questions
D/C 3-5	- Statistical vocabulary - Collecting and recording data - Interpreting data - Two way tables - Sampling methods - Understanding the pros and cons of the different averages - Averages from a frequency table - Averages from grouped data - Frequency Polygons - Stem + Leaf Diagrams - Pie charts - Scatter diagrams - Time series graphs	- Students should understand and be able to use the following key terms: primary data, secondary data, qualitative data, quantitative data, discrete data, continuous data, sample, bias, and hypothesis. - Students need to be confident with tallying, grouping data (including using inequality symbols) and finding the modal class. - Students should be able to answer questions based on data in tables. This might include drawing conclusions about what the data shows e.g. trends etc. - Students should be able to complete partially filled two way tables. - Students should be able to draw and complete two way tables from data given in written form. - Students should understand and be able to describe methods for random sampling and systematic sampling. - Students need to understand and be able to explain why certain averages might be more or less useful with different sets of data. - Students will need to be able to find the mode, median, mean and range from a frequency table. - Students will need to be able to find the modal class (or group), and the class interval containing the median from a grouped frequency table. - Students will need to be able to calculate an estimate of the mean from a grouped frequency table. NB Exam questions may not provide prompts such as additional empty columns on a table. NB Students appear unlikely to be asked to calculate an estimate for the median from grouped data. However this may be worth covering with more able groups. - To be able to draw and interpret frequency polygons from grouped frequency tables - To be able to draw and interpret stem + leaf diagrams - To be able to find all averages from a stem + leaf diagram - Interpret and draw pie charts including measuring angles, working out angles, calculating frequency etc. - Plot points on a scatter graph. - Recognise positive and negative correlations as well as scatter graphs with no correlation and understand the relationships that these correlations show. - Find and consider outliers on a scatter graph - Draw an accurate line of best fit and use it to make predictions. - Reading and interpreting time series
B/A 6-7	Stratified sampling	- Students should understand that stratified sampling is used to calculate the size of a sample to ensure that it is representative of the 'population' as a whole. - Students should be able to use stratified sampling to calculate the sample size for different groups for a survey. Calculations may require rounding including some where the rounded numbers do not add up to the correct total.

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	- Range, quartiles and inter-quartile range - Box plot	- Students should understand that after the stratified sample size has been calculated, it will still be necessary to use a sampling method to select the individuals in each sample. - Students need to understand range, quartiles and inter-quartile range and to be able to work them out from a list of data. <i>NB At this stage students are learning about quartiles etc. but will apply them to cumulative frequency at another point in the scheme of work.</i> - Students need to draw box plots from a list of data given - Students need to be able to interpret and answer questions from a box plot
A*	<i>No A* topics at this stage</i>	
Resources / ideas		

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N5 – Ratio and proportion (12 lessons lessons)		
Grade	Topics	Example questions
D/C 3-5	- Simplifying ratios - Writing ratios in the form 1:n - Simple ratio problems - Sharing an amount in a given ratio - Unitary method - Exchange rates	- Write these ratios in their simplest form: 2:6 / 4:28 / 30:6 / 40p:£1 / 30cm:1m / 2 hours:45 minutes - In a class there are 28 students. 12 are boys. Write down the ratio of boys to girls in its simplest form. - A table has a length of 1.2m and a width of 40cm. Write down the ratio of the length to the width in its simplest form. - Write these ratios in the form 1:n. 2:5 / 10: 5 / 5:12 / 4cm:8mm / 60p:£1 - In a batch of concrete the ratio of cement to sand is 2:5. How much sand is needed to mix with 10kg of cement? - In a school the ratio of teachers to students is 2:25. If there are 500 students, how many teachers are there? - A farmer has sheep and pigs in the ratio 3:7. He has 18 pigs. How many sheep does he have? - Alex draws a plan of his bedroom using a scale of 1:50. On the plan the length of the bedroom is 8cm. What is the actual length of Alex’s bedroom in metre? - Share: £80 in the ratio 1:4 / 250kg in the ratio 7:3 / 45 litres in the ratio 5:4 / 40p in the ratio 1:3:4 - Bob and Betty share 40 sweets in the ratio 2:3. How many sweets does Bob get? - Bill, Phil and Jill share £300 in the ratio 2:3:5. How much money does Phil get? - If 5 pens cost 75p, how much do 8 pens cost? 8 cinema tickets cost £46. How much would 10 cinema tickets cost? - These ingredients make a quiche Lorraine for 4 people: 100g pastry, 100g bacon, 75g cheese, 2 eggs, 150ml milk. How much of each ingredient would you need for a quiche for 8 people? 6 people? £1 = 1.18 euros. a. Change £400 into euros. b. Change 354 euros into pounds. - Dave is on holiday in Switzerland. £1 = 1.12 euros = 1.68 Swiss francs. He wants to buy a pair of sunglasses. He can pay 55 euros or 80 Swiss francs. Which is the better deal?
B/A 6-7	- Graphs - Direct proportion - Inverse proportion	- Draw graphs to show proportional relationships including exchange rates, metric/imperial conversions etc. - Use graphs to find the gradient of the line or an equation for the line. See recent module questions. - Understand what it means for two variables to be directly proportional to each other. - Write equations to show a directly proportional relationship including square and cubic proportionality, find the constant of proportionality (k) and find other missing values for the variables. - Write equations to show an inversely proportional relationship, find the constant of proportionality (k) and find other missing values for the variables.
A*	No A* topics at this stage.	
Resources / ideas		

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G3 – Length, area and volume (20 lessons lessons)		
<i>NB – Some formulas are given on the exam paper.</i> <i>NB – Students need to be confident to express answers in terms of π.</i>		
Grade	Topics	Example questions
D/C 3-5	- Circles - Surface area - Volume - Units	- Work out the area and the circumference of a circle. - Work out the radius of a circle when given the area or the circumference. - Work out the difference between the area of a square with 8cm sides and a circle with a diameter of 8cm / radius of 4cm. - Work out the surface area of a cylinder. - Work out the volume of a cube, cuboid, triangular prism or cylinder. - Convert between different units for area and volume e.g. m^2 to cm^2. <i>A good time to revisit areas of other 2d shapes studied earlier in the year.</i>
B/A 6-7	- More circles - Circle theorems - Pyramids and cones	- Work out the area of a semi-circle. - Work out the perimeter of a semi-circle. - Work out the area or perimeter of a compound shape which includes a semi-circle. - Work out the area of a sector of a circle. - Work out the arc length or perimeter of a sector of a circle. - Know and use the following facts: the angle at the centre is double the angle at the circumference / angles in the same segment are equal / the angle in a semicircle is a right angle / opposite angles in a cyclic quadrilateral add up to 180° / the angle between the tangent and the radius is a right angle / two tangents from a point to a circle are equal / the perpendicular line from the centre of a circle to a chord bisects the chord / alternate segment theorem. - Work out the volume of a pyramid or a cone.
A* 8	- More pyramids and cones - Spheres - Frustums - Circle theorem proof	- Work out the surface area of a pyramid (including using Pythagoras). - Work out the curved surface area / total surface area of a cone. - Work out the volume or the surface area of a sphere or a hemisphere when given the formula. - Work out the volume or surface area of a frustum. - Use geometrical proof to explain circle theorems.
Resources / ideas		
ALL FORMULAE HAVE BEEN REMOVED FROM THE EXAM. STUDENTS WILL NEED TO KNOW FORMULAE FROM NOW ON		

Edexcel Linear GCSE – Higher Scheme of Work

S3 – Probability (15 lessons)																									
Grade	Topics	Example questions																							
D/C 3-5	- Probability notation - Probability of an event not happening - Two-way tables and probability - Expected frequency - Relative frequency - Independent events - Venn diagrams	- Know and use the probability AND ($\cap$) and OR ($\cup$) rules - Understand what $P(A)$, $P(A')$, $P(A \cap B)$, $P(A \cup B)$, $P(A' \cup B')$, $6 \in A$ - Understand that the sum of the probabilities of mutually exclusive outcomes is 1. - Calculate the probability of an event not happening when given the probability of it happening. NB Algebra might be used to represent missing probabilities in a table. - This two-way table gives the number of people in a room. Calculate the probability that a person selected at random is a female / a child / an adult male. Calculate the probability that a male selected at random is a child. <table><tr><td></td><td>Adults</td><td>Children</td></tr><tr><td>Male</td><td>18</td><td>5</td></tr><tr><td>Female</td><td>15</td><td>12</td></tr></table> NB Higher students are likely to have to complete a two-way table before answering this type of question. - If you flip a coin 100 times, how many heads would expect? - A fair four-sided dice is rolled 200 times. How many 1s would you expect? - A spinner is divided into 12 equal sections. Three are green, four are yellow and five are pink. If the spinner is spun 60 times, how many times would you expect to get each colour? - Use relative frequency to estimate the probability of an event happening e.g. A dice was rolled 90 times. Here are the results. Estimate the probability of the next roll being a 3 / 5 etc. Do you think the dice is fair? <table><tr><td>Score</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>Frequency</td><td>12</td><td>15</td><td>26</td><td>9</td><td>17</td><td>11</td></tr></table> - Calculate the probability of two independent events using multiplication e.g. flipping a head and rolling a 5 = $\frac{1}{2} \times \frac{1}{6}$... - Show the following information in a Venn diagram $S = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ $A = \{1, 2, 4, 8\}$ $B = \{1, 3, 4, 6\}$ - Use Venn diagrams to solve probability questions The venn diagrams shows two events when a 12 sided dice is X = number is prime Y = number is a multiple of 2 a)Work out $P(X)$, $P(Y)$, $P(X')$, $P(X \cap Y)$, $P(X' \cup Y)$ b) Is $4 \in X \cup Y$ true State the numbers in each set $X = \{.....\}$ $Y = \{.....\}$		Adults	Children	Male	18	5	Female	15	12	Score	1	2	3	4	5	6	Frequency	12	15	26	9	17	11
	Adults	Children																							
Male	18	5																							
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Edexcel Linear GCSE – Higher Scheme of Work

B/A/A* 6-8	• Venn diagrams • Tree diagrams • Further conditional probability	• Use set notation to describe the shaded areas of the venn diagram (6) • In a car park there are 60 cars. 12 are black, 36 have traction control, 8 are black and have traction control. What is the probability that the the next car to leave the car park has no traction control? (6) • Understand how to complete probability tree diagrams. E.g. A bag contains 6 white and 2 black counters. A counter is chosen and replaced. Then a 2nd counter is chosen. Draw a tree diagram to show the possible outcomes. • Use probability tree diagrams to calculate various probabilities. E.g. (see above) What is the probability of picking 2 white counters / one counter of each colour / at least 1 black counter? • Use probability tree diagrams to calculate probabilities when an item is not replaced. E.g. as above but without the first counter being replaced. • Calculate probabilities where a tree diagram is not the best method. E.g. One spinner has 3 blue sides, 2 yellow sides and 3 white sides. Another spinner has 2 blue sides, 2 green sides and 4 white sides. Calculate the probability that both spinners will land on the same colour.
Resources / ideas		

Edexcel Linear GCSE – Higher Scheme of Work

– Fractions, decimals, surds (8-10 lessons)		
Grade	Topics	Example questions
D/C 3-5	- Calculating with fractions - Fractions of amounts - Fractions problems - Converting decimals to fractions - Terminating and recurring decimals - Converting fractions to decimals - Manipulating decimals - Error interval	- Add, subtract, multiply and divide fractions (including with whole numbers or mixed numbers) - Work out a fraction of any amount with or without or calculator. - Use knowledge of fractions to answer a range of questions (good examples in text book). - Convert these decimals to fractions and simplify where possible: 0.7 / 0.51 / 0.32 / 0.265 - Use prime factor composition of the denominator to decide whether fractions will convert to terminating or recurring decimals. NB This is as opportunity to revise prime factor decomposition. - Use facts about the decimal equivalents of some fractions to convert fractions to decimals. Use formal division to convert fractions to decimals including recurring decimals: $\frac{3}{8} \rightarrow 3 \div 8$ (use bus stop method) = 0.375 / $\frac{5}{6} \rightarrow 5 \div 6 = 0.8333...$ NB Students also need to use appropriate 'dot' notation for recurring decimals. - Given that $38 \times 52 = 1976$, find the value of: 3.8×5.2 / 38×520 / $1976 \div 5.2$ / $19.76 \div 380$ - Write the error interval of 2.5<2.5≤.....
B/A 6-7	- Converting recurring decimals to fractions (using the standard algebraic method) - Bounds - Adding, subtracting and multiplying with bounds - Simplifying surds - Expanding brackets with surds - Rationalising the denominator	- Convert these recurring decimals to fractions: 0.444444... / 0.722222... / 0.8272727... / 0.6321321321... / 0.81757575... / Challenge: 0.012345678901234567890123456789... - Prove that $0.575757... = \frac{19}{33}$ NB These questions should all use appropriate 'dot' notation for recurring decimals. I just don't know how to do it in Microsoft Word! - Write the upper and lower bounds of these measurements: 6.7m / 7.74ml / 0.813kg / 6km - Two pieces of wood measure 1.2m and 83.6cm (both accurate to 1 decimal place). Work out the upper and lower bounds of the total length if the two pieces of wood are joined together. - A bag contains 98g of sugar before 34g of sugar are taken out. Both measurements are correct to the nearest gram. Find the upper and lower bounds for the weight of the remaining sugar. - A jigsaw measures 24cm by 21cm (both measured to the nearest cm). Find the minimum and maximum area of the jigsaw. - Simplify: $\sqrt{200}$ / $\sqrt{32}$ / $\sqrt{28}$ - Work out the value of k: $\sqrt{8} = k\sqrt{2}$ / $\sqrt{80} = k\sqrt{5}$ - Expand and simplify: $\sqrt{3}(2 + \sqrt{3})$ / $(\sqrt{5} - 1)(2 + \sqrt{5})$ / $(2 - \sqrt{3})^2$ - Rationalise the denominator and simplify where possible: $\frac{4}{\sqrt{12}}$ / $\frac{2 + \sqrt{2}}{\sqrt{2}}$ NB Questions may involve other topics such as the area of a 2d shape, Pythagoras' Theorem or using the Quadratic Formula and leaving answers in simplified surd form.

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A* 8	Dividing with bounds	A car travels for 3 hours (to the nearest hour). In this time it travels 150 miles (to the nearest 10 miles). Work out the upper and lower bounds of the average speed of the car.
Resources / ideas In the last set of assessments the majority of surd questions were involved with shape. Once skills are learnt it is worth working on this.		

Edexcel Linear GCSE – Higher Scheme of Work

A7 – Algebraic fractions and algebraic proof (4-6 lessons)		
Grade	Topics	Example questions
A/A* 7-8	- Completing the square - Points on a quadratic graph - The quadratic formula - Setting up and solving quadratic equations - Simplifying algebraic fractions - Adding and subtracting algebraic fractions - Adding and subtracting harder algebraic fractions - Multiplying and dividing algebraic fractions - Algebraic proof	- Write the following expressions in the form $(x + p)^2 + q$: $x^2 + 4x + 6$ / $x^2 + 8x + 15$ / $x^2 + 5x$ / $x^2 - 4x + 9$ etc. - Write the following expressions in the form $a(x + p)^2 + q$: $2x^2 + 4x + 5$ / $3x^2 - 12x$ / $5x^2 + 30x + 50$ etc. - By completing the square, find the minimum value of the expressions above. - Solve the following equations by completing the square: $x^2 - 12x + 20 = 0$ / $x^2 + 2x - 63 = 0$ / $x^2 - 10x = 0$ - Use completing the square to find the turning points(maximum or minimum) on a quadratic curve. - Find the y intercept of a quadratic curve - Find the roots of a quadratic graph (This is a good time to revisit solving quadratic equations through factorising) (7/8) - Use the quadratic formula to solve the following equations: $3x^2 + 10x + 6 = 0$ / $5x^2 - 6x + 1 = 0$ / $x^2 + 4x + 1 = 0$ - Solve worded questions such as: A number and its square are added together. The total is 12. Find the two possible values of the number. / A rectangle has length $2x + 5$ and width $x - 3$. The area of the rectangle = 90cm^2. Show that $2x^2 - x - 105 = 0$ and hence calculate the perimeter of the rectangle. NB This topic was covered in Solving Equations 1 (see above) but some revision may be beneficial. - Simplify: $\frac{2x^5}{x^2}$ / $\frac{x^2 - 5x}{2x}$ / $\frac{x^2 + 4x + 3}{x^2 + 5x + 6}$ / $\frac{4 - x^2}{(x + 2)^2}$ - Write as a single fraction in its simplest form: $\frac{x}{3} + \frac{x}{4}$ / $\frac{1}{3x} + \frac{1}{2x}$ / $\frac{x}{2} + \frac{x+1}{3}$ / $\frac{4}{x+2} - \frac{3}{x+1}$ - Write as a single fraction in its simplest form: $\frac{1}{x+2} - \frac{1}{x^2+3x+2}$ / $\frac{3}{x-2} - \frac{2}{x^2-4}$ - Write as a single fraction in its simplest form: $\frac{x}{3} \times \frac{x-3}{4}$ / $\frac{x+1}{3} \times \frac{3x+3}{2}$ / $\frac{3x-12}{4} \div \frac{x-4}{x+4}$ - Use algebra to prove mathematical statements such as: <i>The sum of any even number and any odd number is always odd.</i> <i>The sum of any 3 consecutive numbers is always a multiple of 3.</i> <i>The product of any two odd numbers is always odd.</i>
Resources / ideas It is worth building in surds and shape into this unit		

Edexcel Linear GCSE – Higher Scheme of Work

G4 – Reading and using Sine, Cosine and Tangent curves and Trigonometry (6- 8 lessons)		
Grade	Topics	Example questions
C 4	Pythagoras	- Use Pythagoras' Theorem to work out the length of the hypotenuse of a triangle given the two shorter sides. - Use Pythagoras' Theorem to work out the length of a side of a triangle other than the hypotenuse given the other two sides. - Use Pythagoras' Theorem to work out the length of a line segment. This might be from a diagram or just a pair of co-ordinates. NB Questions on this topic could be with or without a calculator. Pythagoras is an opportunity to revise rounding to decimal places and significant figures. Pythagoras can you be used as part of an area question when you have to find the perpendicular height or a perimeter question. Can also be with volume and surface area
B/A 5-7	- Trigonometric graphs - Trigonometry (right-angled triangles only)	- Know the exact values of sin, cos and tan at key angles (0, 30, 45, 60, 90 degrees) - To know and use Sine, Cosine and Tangent curves to find values when you are given angles - Recognise Sine, Cosine, and Tangent graphs - Sketch Sine, Cosine and Tangent curves - Use Sine, Cosine and Tangent functions and graphs to find the two angles. E.g State the two angles between 0° and 360° for the sine value of 0.6 - Use trigonometry to find the size of a missing angle of a right-angled triangle. - Use trigonometry to find the length of a missing side of a right-angled triangle. - Use trigonometry to find missing lengths and/or angles in a contextualised question. NB A calculator is essential for this topic. Trigonometry is an opportunity to revise rounding to decimal places and significant figures.
A*	No A* topics at this stage.	
Resources / ideas There are some very good questions in the Chapter Review Exercise.		

Edexcel Linear GCSE – Higher Scheme of Work

N4 – Percentages (4-6 lessons)		
<i>NB – Recapping N2 may be an appropriate starting point before working on N3</i>		
Grade	Topics	Example questions
D/C 3-5	- Percentages of amounts (without a calculator) - Percentages of amounts (with a calculator) - Percentage increase and decrease (without a calculator) - Percentage increase and decrease (with a calculator) - Express a number as a percentage of another number - Simple and compound interest - Growth and Decay	- Work out: 50% of 60 / 25% of 48 / 10% of 80 / 5% of 40 - Work out: 50% of £17 / 75% of 64 / 10% of 32 / 20% of 38g / 1% of 80 / 17½% of 120cm - Work out: 11% of 18 / 21% of 45kg / 34% of 230m / 4.5% of £320 / 0.7% of 245 litres - Increase: 60 by 10% / 42 by 50% / 88 by 25% / 40 by 17½% - Decrease: 80 by 75% / 48 by 10% / £260 by 20% / 99g by 1% - Increase: 340 by 17% / 905kg by 42% / £1680 by 4.7% / - Decrease: 756km by 34% / 67ml by 8% / 605g by 0.9% - A suit is normally sold for £360. In a sale the price is reduced to £295.20. What % reduction is this? - Find: 16 as a percentage of 20 / 36 as a percentage of 75 / 42 as a percentage of 147 - Dave scored 53 out of 60 on Paper 1 and 39 out of 45 on Paper 2. Which paper did he do better on? Explain your answer. - Find the total simple / compound interest earned or the total amount after interest is added with the following investments: £200 at 5% for 3 years / £500 at 6% for 2 years / £480 at 3% for 4 years. - Jim puts some money in an account which pays compound interest at 5%. After 2 years he has £595.35. How much money did he put in the account initially? - Which of these accounts earns the most interest? 8 years at 6% simple interest or 6 years at 8% compound interest? Explain your answer. - A car depreciates in value by 8% each year. New cars cost £11,000. How much does the car cost after 1 year / 3 years/ 5 years - A colony of bacteria grows by 4% every hour. At first the colony has 100 bacteria. How many bacteria after 1hour/ 5 hours / 1 day/ 1 week Students need to know growth and decay are exponential, work in the same way as compound interest, and recognise these exponential curves. <i>NB The use of decimal multipliers is recommended for increases, decreases and compound interest with a calculator.</i> <i>NB Some rounding of answers may be required.</i> <i>NB Make some use of context for these questions e.g. sales, VAT, 20% extra free etc.</i>
B 6	Reverse percentages	- A sale gives 20% / 15% of the original prices. What was the original price if the sale price is...? - Maureen gets a 6% pay rise. Her new salary is £17914. What was her salary before the pay rise? <i>NB Some students may be confident to use decimal short-cuts for reverse percentages. Other students will prefer to find 1% before finding 100% (the original amount).</i>

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A/A* 7/9	<i>No A/A* grade topics at this stage.</i>
Resources / ideas Percentages spiders (add hyperlink) Opportunity to look at genuine sale adverts (especially newspaper ones) etc. Comparing sales / money off / % extra free to find the best deal. (Quite a common exam-type question).	

Edexcel Linear GCSE – Higher Scheme of Work

S2 – Processing, representing and interpreting data (8-10 lessons)	
Topics	Example questions
- Pie charts - Scatter graphs - Stem and leaf diagrams - Frequency polygons	- Interpret and draw pie charts including measuring angles, working out angles, calculating frequency etc. - Plot points on a scatter graph. - Recognise positive and negative correlations as well as scatter graphs with no correlation and understand the relationships that these correlations show. - Find and consider outliers on a scatter graph - Draw an accurate line of best fit and use it to make predictions. - To read and interpret stem and leaf diagrams - To find the 3 averages from a stem and leaf diagram - To draw and interpret frequency polygons
- Cumulative frequency - Box plots	- Work out cumulative frequency from a frequency table. - Plot and draw an accurate cumulative frequency curve. - Use a cumulative frequency curve to find the median, quartiles and inter-quartile range. - Plot box plots when told range, lowest number, LQ, IQR and Median - Draw and interpret box plots. - Compare box plots. Students are normally expected to compare an average e.g. the median and a measure of spread e.g. the range or IQR.
Histograms with unequal class intervals	- Work out frequency density from a frequency table. - Work out the scale and draw an accurate histogram from a frequency table. - Combine the partial information given in a frequency table and on a histogram to complete missing frequencies and bars.
Resources / ideas It is well worth revising finding IQR, LQ, UQ and median, as well as working backwards Also worth revisiting estimate of the mean as an extension to both histogram and cumulative frequency questions Consider making a data sheet either by collecting data from the class or by obtaining it from www.censusatschool.org.uk . This data sheet could then be used for the whole of this section of the scheme of work.	

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G9 – Further Pythagoras' Theorem and Trigonometry (6-8 lessons)		
Grade	Topics	Example questions
D/C 3-5	Co-ordinates in 3 dimensions	Use axes and co-ordinates to find and describe points in 3 dimensions.
A/A* 7-8	- Pythagoras and Trigonometry in 3 dimensions. - The area of a triangle - The sine rule - The cosine rule	- Apply knowledge of Pythagoras' Theorem and right-angled trigonometry to problems in 3 dimensions. - Use 3d Trigonometry to find missing coordinates - Use $\frac{1}{2}ab \sin C$ to find the area of triangles. - Use $\frac{1}{2}ab \sin C$ to find a side length or an angle when given the area of a triangle. - Use the sine rule to find a missing side of a triangle. - Use the sine rule to find a missing angle of a triangle. - Use the cosine rule to find a missing side of a triangle. - Use the cosine rule to find a missing angle of a triangle. NB Formulas for non-right-angled trigonometry are given in exam papers. NB A scientific calculator is essential for this topic. Trigonometry is an opportunity to revise rounding to decimal places and significant figures.
Resources / ideas There are some very good questions in the Chapter Review Exercise.		

G10 – Vectors (4-6 lessons)		
Grade	Topics	Example questions
A/A* 7-8	- Vector notation - Adding vectors - Parallel vectors - Solving vector problems	- Understand vector notation including column vectors and notation using arrows. - Understand how adding two vectors can give a single resultant vector. - Understand that a vector which is a multiple of another vector will be parallel. - Solve a range of vector problems in 2 dimensions – the text book has lots of good examples.
Resources / ideas		

Edexcel Linear GCSE – Higher Scheme of Work

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A8 – Transformations of functions (4-6 lessons) – Chapter 30	
Topics	Example questions
• Function notation • Translations of curves parallel to the axes • Stretching curves parallel to the axes • Rotating curves about the origin and reflecting curves in the axes.	• Understand function notation and use it to substitute values and solve equations. • Identify, draw or write the functions of curves which have been translated parallel to the x or y axis. • Identify, draw or write the functions of curves which have been stretched parallel to the x or y axis. • Identify, draw or write the functions of curves which have been rotated or reflected. <i>NB Students will have to learn all of the different rules for this topic.</i>
Resources / ideas	

Edexcel Linear GCSE – Higher Scheme of Work

G7 – Measures (6-8 lessons) – Chapter 7		
Grade	Topics	Example questions
D/C	- Compound measures - Speed - Density	- Solve problems using compound measures e.g. Water is flowing into a tank. In 5 minutes, 300 litres of water has flowed into the tank. Work out the average rate of flow of the water. State the units with your answer. - Understand and use the formula for speed, distance and time to solve various problems involving speed. NB These questions may involve a mixture of units (see above). - Understand and use the formula for density, mass and volume to solve various problems involving density. NB Students often seem to get rather caught up with the formulae when often a more straightforward proportional method can be used.
Resources / ideas - Students need to know the following conversions relating to metric units. Length 10mm = 1cm, 100cm = 1m, 1000mm = 1m, 1000m = 1km Weight 1000mg = 1g, 1000g = 1kg, 1000kg = 1 tonne Capacity 100cl = 1 litre, 1000ml = 1 litre, 1000l = 1 cubic metre, 1000cm³ = 1 litre - Students need to know the following conversions relating to imperial and metric units. Length 8km = 5 miles, 30cm = 1 foot, 1m = 39 inches 2.5cm = 1 inch Weight 1kg = 2.2lb (pounds), 25g = 1 ounce Capacity 4.5 litres = 1 gallon, 1 litre = 1.75 pints - Students may be required to know the following conversions relating to imperial units. Length 12 inches = 1 foot, 3 feet = 1 yard Weight 16 ounces = 1 pound, 14 pounds = 1 stone Capacity 8 pints = 1 gallon All been taken out although discussions on conversions, why we use metric units are used, why changes were made etc.		