

Mathematics GCSE Linear

3rd Year

Notes

- This scheme of work relates to the [AQA GCSE Specification 8300](#).
- It is aimed at classes that will fast-track their GCSE, completing the course content by the November of Year 11. The GCSE examination will be sat in the summer of Year 11.
- The changes required to incorporate the new GCSE are shown in blue.
- This scheme of work includes the topics covered in 3rd Year.

GCSE Grade Conversion

The table below shows how the new GCSE grades will relate to the current GCSE grades:

Current GCSE Grade	New GCSE Grade	Notes
A*	9	Grade 9 is the top 20% of students getting grades 7, 8, 9.
	8	
A	7	The bottom of grade 7 is equivalent to the bottom of grade A.
	6	
B	5	Grade 5 is equivalent to the bottom third of grade B and the top third of grade C.
	4	
C	3	The bottom of grade 4 is equivalent to the bottom of grade C.
	2	
D	2	The new benchmark for an acceptable GCSE in mathematics is likely to be grade 5.
E		
F		
G	1	The new Foundation paper will go from grades 5 down to 1.

Order of Topics

		Topic
**		**START OF GCSE COURSE** **START OF YEAR 9**
1Y9	N4.1 N4.2 N5.1 N5.6	Algebraic Expressions (B/C/D) Being able to use algebraic notation (3). Distinguish the meaning of 'expression', 'identify', 'equation' and formula (3). Simplifying algebraic expressions (3), expanding single (3), double brackets (4) and factorising into a single bracket (4). Algebraic substitution (3/4).
2Y9	N1.6	Multiples, factors and powers (C/D) Understand multiples, factors, primes, powers (3). Use prime factor decomposition (4). Find the HCF and LCM of numbers (5). Apply systematic listing strategies including use of the product rule for counting.
3Y9	N1.5 N2.1 N2.2 N2.6 N2.7	Fractions (C/D) Finding a fraction of a quantity, ordering fractions and simplifying fractions (3). Adding, subtracting & multiplying fractions (4). Understanding reciprocals and dividing fractions (4).
4Y9	N2.3 N1.5 N2.4	Fractions, decimals, percentages (A/C/D) Converting fractions, decimals, percentages (3). Ordering fractions, decimals, percentages (4). Converting recurring decimals to fractions (7).
5Y9	N1.2 N1.1 N1.3	Mental and written calculations (C/D) Add, subtract, multiply and divide both integers and decimals. Add, subtract, multiply & divide negative numbers (3). Use a known calculation to work out related calculations, including inverse operations.

		Topic
6Y9	N5.4	Solving linear equations (B/C/D) Solving equations with unknowns on one side, unknowns on both sides (3), brackets (4) and fractions (5). Forming, then solving linear equations (4).
**		**HALF TERM **
7Y9	N5.6	Changing the subject (B/C) Re-arranging equations where the new subject appears once (5).
8Y9	S3.3 S3.2 S4.1	Distributions (C/D) Calculate averages and range of discrete data (3). Calculate averages from frequency table (4) and grouped frequency table (5). Construct frequency polygon for continuous data. Being able to interpret and construct pie charts.
9Y9	N2.5 N2.6 N2.7	Percentage Increase and decrease (B/C/D) Finding a percentage of a quantity and one quantity as a percentage of another (3). Calculate percentage increase and decrease (4), profit & loss, compound interest (5) and reverse percentages (5).
10Y9	G4.1 G4.3 G4.4 G3.7 G3.4	Area, perimeter and volume (A/B/C/D) Area & perimeter of parallelograms (3), triangles (3), trapeziums (4), circles (4) and compound shapes (4). Calculating the length of an arc and the area of a sector (6). Volume (4) and surface area (5) of prisms. Converting between different metric units of length, area and volume (4).
11Y9		Compound Measures Calculate compound measures, including density and pressure (4).

		Topic
12Y9	G1.4 G1.6	Quadrilaterals and Symmetry (D) Identifying and using the properties of quadrilaterals (3). Reflective symmetry and order of rotational symmetry.
**		**CHRISTMAS YEAR 9**
13Y9	N1.3 N1.1 4 N1.4	Using a calculator and approximations (C/D) Using BODMAS for order of operations (3). Using a calculator for complex calculations. Rounding to decimal places (3) and significant figures (3), and estimating calculations (4). Use inequality notation to specify simple error intervals due to truncation or rounding. Estimating square roots (5).
14Y9	G1.1 G1.2 G1.3 G3.8	Angle rules (C/D) Use basic angle rules; angles on straight line, angles at a point, vertically opposite angles (3). Identify angles on parallel lines (3). Interior and exterior angles of polygons (3).
15Y9	G2.1 G1.8 G2.2	Pythagoras, similarity & trigonometry (B/C) Use Pythagoras Theorem to find the lengths of unknown sides in right-angled triangles (4). Find the mid-point and length of a line segment (5). Understanding properties of similar shapes. Using similar triangles to calculate lengths of unknown sides (6). Calculating unknown sides and angles of right-angled triangles using sine, cosine and tangent. (6/7). Know the exact values of $\sin\theta$ and $\cos\theta$ and $\tan\theta$ for $\theta = 0^\circ, 30^\circ, 45^\circ, 60^\circ$ and 90° (7).

		Topic
16Y9	N6.1 2	Speed, distance, time, real graphs, rates (C/D) Calculating using speed, distance and time (3). Constructing and interpreting (gradient gives velocity) distance, time graphs for constant velocity (3). Constructing and interpreting other real life graphs, including rate being the gradient of a linear graph (5) . Solving problems involving rate of change.
**		**HALF TERM**
17Y9	N5.2 N5.5	Removing brackets and factorising (A/B) Factorising quadratic expressions, of the form ax^2+bx+c , including the difference of two squares (5/7). Solving quadratic equations by factorising (5/7).
18Y9	N5.8	Trial & Improvement (C) Solve equations by trial & improvement.
19Y9	N1.8 N1.9	Indices (A*/A/B/C) Understanding index notation. Multiplying, dividing and raising one power to another power (5). Understanding and using negative indices (7). Being able to evaluate fractional indices (7).

		Topic
20Y9	N1.1 0	Standard Form (B) Writing very large and small numbers in standard form (4). Performing calculations with numbers in standard form (5).
21Y9	N6.3 N6.4 N6.5 N6.6	Gradient and equations (A/B/C) Draw graphs of functions by plotting co-ordinates. Calculate and use gradient (3). Determine equation of straight line graphs (4). Equation of parallel (5) and perpendicular lines (7). Equation of line between two points (5).
**		**EASTER YEAR 9**
22Y9	N6.7 N5.4	Simultaneous equations (B) Solving simultaneous equations graphically. Solving simultaneous equations by elimination and substitution (5). Forming, then solving simultaneous equations (5).
23Y9	S5.1 S5.3 S5.4 S5.2 S5.7 S5.8 S5.9	Basic Probability (C/D) Understanding the language of probability and calculating probability using equally likely outcomes (3/4). Estimating probability using relative frequency and compare experimental probability to theoretical probability (4). Understand impact of different sample sizes. Record, describe and analyse probability experiments using tables and frequency trees (4).

		Topic
24Y9	S5.5 S5.6	Combining Probabilities / Tree Diagrams (A*/A/B) Calculating probability for mutually exclusive, independent and dependent events (6). Representing probabilities, including conditional probabilities, using tree diagrams (7), two-way tables , sets and Venn diagrams (7).
**		**HALF TERM ** **YEAR 9 EXAMS**
25Y9	G3.1 G3.6	Maps and plans (C/D) Use and construct scale drawings. Understanding and using bearings (3).
26Y9	G3.9 G3.1 0 G3.1 1	Loci and constructions (C/D) Constructing triangles using protractor, compass & ruler (3). Performing compass and straight edge constructions, including an angle of 60° (4). Solving locus problems (4). Know that the perpendicular distance from a point to a line is the shortest distance to the line.
**		**END OF YEAR 9 **

Examinations will be held in school at the following times -

- Autumn Term Test 1 (just before October half-term)
- Autumn Term Test 2 (just before Xmas)
- Spring Term Test (just before Easter)

End of Year Exam (straight after May half-term).

GCSE Linear SOW

3rd Year – Set 2

Notes

- This scheme of work relates to the [AQA GCSE Specification 8300](#).
- It is aimed at classes that will fast-track their GCSE, completing the course contact by the November of Year 11. The GCSE examination will be sat in the summer of Year 11.
- The changes required to incorporate the new GCSE are shown in blue.
- This scheme of work includes the topics covered in 3rd Year.

Date Written: July 2013.

Last Updated: June 2015

GCSE Grade Conversion

The table below shows how the new GCSE grades will relate to the current GCSE grades:

Current GCSE Grade	New GCSE Grade	Notes
A*	9	Grade 9 is the top 20% of students getting grades 7, 8, 9.
	8	
A	7	The bottom of grade 7 is equivalent to the bottom of grade A.
B	6	Grade 5 is equivalent to the bottom third of grade B and the top third of grade C.
	5	
C	4	The bottom of grade 4 is equivalent to the bottom of grade C.
D	3	The new benchmark for an acceptable GCSE in mathematics is likely to be grade 5.
E	2	
F		
G	1	The new Foundation paper will go from grades 5 down to 1.

Order of Topics

		Topic
**		**START OF GCSE COURSE** **START OF YEAR 9**
1Y9	N4.1 N4.2 N5.1 N5.6	Algebraic Expressions (B/C/D) Being able to use algebraic notation (3). Distinguish the meaning of 'expression', 'identify', 'equation' and formula (3). Simplifying algebraic expressions (3), expanding single (3), double brackets (4) and factorising into a single bracket (4). Algebraic substitution (3/4).
2Y9	N1.6	Multiples, factors and powers (C/D) Understand multiples, factors, primes, powers (3). Use prime factor decomposition (4). Find the HCF and LCM of numbers (5). Apply systematic listing strategies including use of the product rule for counting.
3Y9	N1.5 N2.1 N2.2 N2.6 N2.7	Fractions (C/D) Finding a fraction of a quantity, ordering fractions and simplifying fractions (3). Adding, subtracting & multiplying fractions (4). Understanding reciprocals and dividing fractions (4).
4Y9	N2.3 N1.5 N2.4	Fractions, decimals, percentages (A/C/D) Converting fractions, decimals, percentages (3). Ordering fractions, decimals, percentages (4). Converting recurring decimals to fractions (7).
5Y9	N1.2 N1.1 N1.3	Mental and written calculations (C/D) Add, subtract, multiply and divide both integers and decimals. Add, subtract, multiply & divide negative numbers (3). Use a known calculation to work out related calculations, including inverse operations.

		Topic
6Y9	N5.4	Solving linear equations (B/C/D) Solving equations with unknowns on one side, unknowns on both sides (3), brackets (4) and fractions (5). Forming, then solving linear equations (4).
**		**HALF TERM **
7Y9	N5.6	Changing the subject (B/C) Re-arranging equations where the new subject appears once (5).
8Y9	S3.3 S3.2 S4.1	Distributions (C/D) Calculate averages and range of discrete data (3). Calculate averages from frequency table (4) and grouped frequency table (5). Construct frequency polygon for continuous data. Being able to interpret and construct pie charts.
9Y9	N2.5 N2.6 N2.7	Percentage Increase and decrease (B/C/D) Finding a percentage of a quantity and one quantity as a percentage of another (3). Calculate percentage increase and decrease (4), profit & loss, compound interest (5) and reverse percentages (5).
10Y9	G4.1 G4.3 G4.4 G3.7 G3.4	Area, perimeter and volume (A/B/C/D) Area & perimeter of parallelograms (3), triangles (3), trapeziums (4), circles (4) and compound shapes (4). Calculating the length of an arc and the area of a sector (6). Volume (4) and surface area (5) of prisms. Converting between different metric units of length, area and volume (4).
11Y9		Compound Measures Calculate compound measures, including density and pressure (4).

		Topic
12Y9	G1.4 G1.6	Quadrilaterals and Symmetry (D) Identifying and using the properties of quadrilaterals (3). Reflective symmetry and order of rotational symmetry.
**		**CHRISTMAS YEAR 9**
13Y9	N1.3 N1.14 N1.4	Using a calculator and approximations (C/D) Using BODMAS for order of operations (3). Using a calculator for complex calculations. Rounding to decimal places (3) and significant figures (3), and estimating calculations (4). Use inequality notation to specify simple error intervals due to truncation or rounding. Estimating square roots (5).
14Y9	G1.1 G1.2 G1.3 G3.8	Angle rules (C/D) Use basic angle rules; angles on straight line, angles at a point, vertically opposite angles (3). Identify angles on parallel lines (3). Interior and exterior angles of polygons (3).
15Y9	G2.1 G1.8 G2.2	Pythagoras, similarity & trigonometry (B/C) Use Pythagoras Theorem to find the lengths of unknown sides in right-angled triangles (4). Find the mid-point and length of a line segment (5). Understanding properties of similar shapes. Using similar triangles to calculate lengths of unknown sides (6). Calculating unknown sides and angles of right-angled triangles using sine, cosine and tangent. (6/7). Know the exact values of $\sin\theta$ and $\cos\theta$ and $\tan\theta$ for $\theta = 0^\circ, 30^\circ, 45^\circ, 60^\circ$ and 90° (7).

		Topic
16Y9	N6.12	Speed, distance, time, real graphs, rates (C/D) Calculating using speed, distance and time (3). Constructing and interpreting (gradient gives velocity) distance, time graphs for constant velocity (3). Constructing and interpreting other real life graphs, including rate being the gradient of a linear graph (5) . Solving problems involving rate of change.
**		**HALF TERM**
17Y9	N5.2 N5.5	Removing brackets and factorising (A/B) Factorising quadratic expressions, of the form ax^2+bx+c , including the difference of two squares (5/7). Solving quadratic equations by factorising (5/7).
18Y9	N5.8	Trial & Improvement (C) Solve equations by trial & improvement.
19Y9	N1.8 N1.9	Indices (A*/A/B/C) Understanding index notation. Multiplying, dividing and raising one power to another power (5). Understanding and using negative indices (7). Being able to evaluate fractional indices (7).

		Topic
20Y9	N1.10	Standard Form (B) Writing very large and small numbers in standard form (4). Performing calculations with numbers in standard form (5).
21Y9	N6.3 N6.4 N6.5 N6.6	Gradient and equations (A/B/C) Draw graphs of functions by plotting co-ordinates. Calculate and use gradient (3). Determine equation of straight line graphs (4). Equation of parallel (5) and perpendicular lines (7). Equation of line between two points (5).
**		**EASTER YEAR 9**
22Y9	N6.7 N5.4	Simultaneous equations (B) Solving simultaneous equations graphically. Solving simultaneous equations by elimination and substitution (5). Forming, then solving simultaneous equations (5).
23Y9	S5.1 S5.3 S5.4 S5.2 S5.7 S5.8 S5.9	Basic Probability (C/D) Understanding the language of probability and calculating probability using equally likely outcomes (3/4). Estimating probability using relative frequency and compare experimental probability to theoretical probability (4). Understand impact of different sample sizes. Record, describe and analyse probability experiments using tables and frequency trees (4).

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**		**HALF TERM ** **YEAR 9 EXAMS**
25Y9	G3.1 G3.6	Maps and plans (C/D) Use and construct scale drawings. Understanding and using bearings (3).
26Y9	G3.9 G3.10 G3.11	Loci and constructions (C/D) Constructing triangles using protractor, compass & ruler (3). Performing compass and straight edge constructions, including an angle of 60° (4) . Solving locus problems (4). Know that the perpendicular distance from a point to a line is the shortest distance to the line.
**		**END OF YEAR 9 **

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Mathematics GCSE Linear SOW

3rd Year – Set 3

Notes

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Order of Topics

		Topic
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1Y9	N4.1 N4.2 N5.1 N5.6	Algebraic Expressions (C/D/E) Being able to use algebraic notation (3). Distinguish the meaning of 'expression', 'identify', 'equation' and formula (3). Simplifying algebraic expressions (3), expanding single (3) & double brackets (4) and factorising into a single bracket. (4) Algebraic substitution (3).
2Y9	N1.2	Negative numbers (E/F) Add, subtract, multiply and divide negative numbers (3).
3Y9	N1.6	Multiples, factors and powers (C/D) Understand multiples, factors, primes, powers (3). Use prime factor decomposition (4). Find the HCF and LCM of numbers (5). Apply systematic listing strategies including use of the product rule for counting.
4Y9	N1.5 N2.1 N2.2 N2.6 N2.7	Fractions (C/D/E) Finding a fraction of a quantity, ordering fractions and simplifying fractions (3). Adding, subtracting & multiplying fractions (4). Understanding reciprocals and dividing fractions (4).
5Y9	N2.3 N1.5	Fractions, decimals, percentages (C/D) Converting fractions, decimals, percentages (3). Ordering fractions, decimals, percentages (4).
**		**HALF TERM **

		Topic
6Y9	N1.2 N1.1 N1.3	Mental and written calculations (C/D/E) Add, subtract, multiply and divide both integers and decimals. Use a known calculation to work out related calculations, including inverse operations.
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**		**CHRISTMAS YEAR 9**
11Y9	N2.5 N2.6 N2.7	Percentages (C/D/E) Finding a percentage of a quantity and one quantity as a percentage of another (3). Calculate percentage increase and decrease (4).

		Topic
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13Y9		Compound Measures Calculate compound measures, including density and pressure (4)
14Y9	N1.3 N1.14 N1.4	Using a calculator and approximations (C/D) Using BODMAS for order of operations (3). Using a calculator for complex calculations. Rounding to decimal places (3) and significant figures (3), and estimating calculations (4). Use inequality notation to specify simple error intervals due to truncation or rounding. Estimating square roots (5).
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**		**HALF TERM**
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		Topic
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18Y9	N5.2 N5.5	Removing brackets and factorising (B) Factorising quadratic expressions, of the form x^2+bx+c , including the difference of two squares (5). Solving quadratic equations by factorising (5).
19Y9	N5.8	Trial & Improvement (C) Solve equations by trial & improvement.
20Y9	N6.1	Linear Sequences (C/D/E) Finding rules for simple number and pattern sequences (3). Finding the nth term for linear sequences (4).
21Y9	N1.8 N1.9	Indices (A/B/C) Understanding index notation. Multiplying, dividing and raising one power to another power (5). Understanding and using negative indices (7).
**		**EASTER YEAR 9**

		Topic
22Y9	N1.10	Standard Form (B) Writing very large and small numbers in standard form (4). Performing calculations with numbers in standard form (5).
23Y9	N6.3 N6.4 N6.5	Gradient and equations (C) Draw graphs of functions by plotting co-ordinates. Calculate and use gradient (3). Determine equation of straight line graphs (4).
24Y9	N6.7 N5.4	Simultaneous equations (B) Solving simultaneous equations graphically. Solving simultaneous equations by elimination and substitution (5). Forming, then solving simultaneous equations (5).
25Y9	G3.1 G3.6	Maps and plans (C/D) Use and construct scale drawings. Understanding and using bearings (3).
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**		**HALF TERM ** **YEAR 9 EXAMS**

		Topic
27Y9	S5.5 S5.6	Combining Probabilities / Tree Diagrams (A/B) Calculating probability for mutually exclusive, independent and dependent events (6). Representing probabilities, using tree diagrams (7), two-way tables, sets and Venn diagrams (7) .
28Y9	G3.9 G3.10 G3.11	Loci and constructions (C/D) Constructing triangles using protractor, compass & ruler (3). Performing compass and straight edge constructions, including an angle of 60° (4) . Solving locus problems (4). Know that the perpendicular distance from a point to a line is the shortest distance to the line.
**		**END OF YEAR 9 **

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