

GCSE Mathematics for AQA

2-Year Schemes of Work

This document contains Foundation and Higher Schemes of Work for teaching **AQA GCSE Mathematics (8300)** over two years using Cambridge University Press GCSE Mathematics resources.

Calendar overviews for both tiers are followed by separate, detailed Schemes of Work for Foundation and Higher tiers.

Each chapter has a dedicated page, with:

- suggested teaching hours
- learning outcomes by Student Book section
- curriculum references by Student Book section
- prerequisite knowledge and what the current chapter provides prerequisite knowledge for
- details and references to other resources in the series
- key vocabulary

You can use the hyperlinks in the calendar overview pages to jump directly to the page for each chapter.

The AQA specification (8300) uses the same references as those set out in the Department for Education's *Mathematics GCSE subject content and assessment objectives* document:

- **Number** references start with N
- **Algebra** references start with A
- **Ratio, proportion and rates of change** references start with R
- **Geometry and measures** references start with G
- **Probability** references start with P
- **Statistics** references start with S.

Where the DfE has set out subject content as standard type, underlined type and bold type, the AQA specification uses the terms *basic foundation content*, *additional foundation content* and *higher content only*, as follows:

- Standard content = basic foundation
- Underlined content = additional foundation
- Bold content = higher only

GCSE Mathematics for AQA

Foundation tier – teaching over 2 years

Chapter	Title	Suggested teaching time
FOUNDATION YEAR ONE		
Autumn term: 14 weeks (49 hours)		
2	Collecting, interpreting and representing data	6
4	Properties of integers (HCF and LCM Only) This section can include chapter 1 for Set 7 and 8	4 4
12	Rounding and estimation	4
5	Working with fractions	5
6	Working with decimals	5
13	Percentages	6
26	Ratio	6
27	Proportion	6
	Revision, test and review	6
Spring term: 12 weeks (42 hours)		
7	Basic algebra	6
8	Properties of polygons and 3D objects	6
9	Angles	6
10	Perimeter	5
11	Area	7
14	Powers and roots	4
15	Standard form	3
	Revision Test Review	4
Summer term: 13 weeks (45.5 hours)		
17	Equations (Leave quadratics until further Algebra)	9
18	Functions and sequences	7
16	Further algebra	7
19	Basic probability	3
20	3D objects	4

21	Units and measure	6
22	Formulae	6
	Revision, test and review	3.5
	Work experience fortnight	7

FOUNDATION YEAR TWO**Autumn term: 14 weeks (49 hours)**

23	Volume and surface area	6
24	Further probability	5
25	Inequalities	5
3	Analysing data	5
28	Graphs of linear functions	5
29	Interpreting graphs	5
30	Vector geometry	4
31	Transformations in a plane	8
	Revision, test and review	2

Spring term: 12 weeks (42 hours)

32	Construction and loci	6
33	Similarity	6
34	Congruence	5
35	Pythagoras' theorem	6
36	Trigonometry	6
37	Graphs of other functions and equations	4
38	Growth and decay	6
	Revision, test and review	3

Summer term: 6 weeks (21 hours)

	Revision	
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Suggested teaching time: 5 hours

Required previous learning

KS3 Maths

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1 Working with integers (Foundation)

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Prerequisite for chapters

12 Rounding and estimation

14 Powers and roots

16 Further algebra

17 Equations

Student Book	Learning outcomes	DfE subject content references	
		Standard	Underlined
Section 1: Basic calculations	<ul style="list-style-type: none"> To identify the correct operations required and use written calculations to solve worded problems To calculate with all four operations of arithmetic using positive and negative numbers 	N1	
		N2	
		N3	
Section 2: Order of operations	<ul style="list-style-type: none"> To apply the hierarchy of operations to accurately work out calculations involving two or more operations 	N2	
		N3	
Section 3: Inverse operations	<ul style="list-style-type: none"> To identify and write the inverses for operations and apply these to check the results of calculations and develop the skills required to solve equations (F/H) 	N3	
		N6	

Other resources

Problem-solving Book Chapter 2 Q1, Chapter 9 Qs 1, 2, 8, 9, 10, Chapter 10 Qs 1, 5

Homework Book 5 Homeworks mapped to the exercises in the Student Book

<p>GCSE Mathematics Online</p> <ul style="list-style-type: none"> • Student Book chapter PDF • Lesson notes • 11 worksheets (+ solutions) • 13 animated widgets 	<ul style="list-style-type: none"> • 13 interactive walkthroughs • 5 auto-marked quickfire quizzes • 5 auto-marked question sets, each with four levels • Auto-marked chapter quiz
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Vocabulary integers, directed numbers

Suggested teaching time: 6 hours

Required previous learning

KS3 Maths

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2 Collecting, interpreting and representing data (Foundation)

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Prerequisite for chapters

The content in this chapter is not prerequisite knowledge for any other chapters

Student Book	Learning outcomes	DfE subject content references	Standard	Underlined
Section 1: Populations and samples	<ul style="list-style-type: none"> To be able to infer properties of populations or distributions from a sample, while knowing the limitations of sampling 	S1		
Section 2: Tables and graphs	<ul style="list-style-type: none"> To be able to interpret and construct tables, charts and diagrams, including frequency tables and bar charts 	S5		
Section 3: Pie charts	<ul style="list-style-type: none"> To be able to draw and interpret pie charts and pictograms for categorical data and vertical line charts for ungrouped, discrete numerical data 	S2		
Section 4: Line graphs for time-series data	<ul style="list-style-type: none"> To use tables and line graphs for time series data 	S2		

Other resources		Assessment	Mark Scheme
Problem-solving Book	Chapter 1 Qs1, 7, Chapter 4 Q12, Chapter 7 Qs1, 9, 10		
Homework Book	6 Homeworks mapped to the exercises in the Student Book		
GCSE Mathematics Online	<ul style="list-style-type: none"> Student Book chapter PDF Lesson notes 16 worksheets (+ solutions) 7 animated widgets 	<ul style="list-style-type: none"> 7 interactive walkthroughs 5 auto-marked quickfire quizzes 5 auto-marked question sets, each with four levels Auto-marked chapter quiz 	

Vocabulary population, sample, representative sample, discrete data, categorical data, continuous data

Suggested teaching time: 5 hours

Required previous learning

KS3 Maths

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3 Analysing data (Foundation)

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Prerequisite for chapters

The content in this chapter is not prerequisite knowledge for any other chapters

Student Book	Learning outcomes	DfE subject content references	Standard	Underlined
Section 1: Averages and range	<ul style="list-style-type: none"> To calculate summary statistics from raw and grouped data To compare two or more sets of data 	S4		
Section 2: Misleading graphs	<ul style="list-style-type: none"> To identify why a graph may be misleading 	S5		
Section 3: Scatter diagrams	<ul style="list-style-type: none"> To construct scatter diagrams To describe correlation To draw a line of best fit To identify outliers 	S4		
		S6		

Other resources

Assessment Choose appropriate stats measure test

Problem-solving Book

Chapter 1 Q2, Chapter 2 Q2, Chapter 6 Q7, Chapter 7 Q11, Chapter 8 Q1, Chapter 10 Q6

Homework Book

6 Homeworks mapped to the exercises in the Student Book

GCSE Mathematics Online

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|--|---|
| <ul style="list-style-type: none"> • Student Book chapter PDF • Lesson notes • 9 worksheets (+ solutions) • 3 animated widgets | <ul style="list-style-type: none"> • 7 interactive walkthroughs • 4 auto-marked quickfire quizzes • 4 auto-marked question sets, each with four levels • Auto-marked chapter quiz |
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Vocabulary bivariate data, correlation, dependent variable, outlier

Suggested teaching time: 6 hours

Required previous learning

KS3 Maths

**4 Properties
of integers
(Foundation)**

Prerequisite for chapters

5 Working with fractions

7 Basic algebra

11 Area

12 Rounding and estimation

18 Functions and sequences

25 Inequalities

35 Pythagoras' theorem

Student Book	Learning outcomes	DfE subject content references	
		Standard	Underlined
Section 1: Types of numbers	<ul style="list-style-type: none"> To recall and understand key definitions To consolidate their understanding of basic place value 	N4	
		N6	
Section 2: Prime factors	<ul style="list-style-type: none"> To apply their knowledge of factors and primes to express a number as a product of its prime factors To simplify a collection of numbers that have been multiplied together by writing them in index form 	N4	
Section 3: Multiples and factors	<ul style="list-style-type: none"> To use the 'listing method' to find the highest common factor and lowest common multiple of a set of numbers To use a prime factor tree to find the highest common factor and lowest common multiple of a set of numbers 	N4	
		N5	

4 Properties of integers (continued)

Other resources		Assessment	Mark Scheme
Problem-solving Book	Chapter 9 Qs 3, 11, Chapter 10 Q7		
Homework Book	5 Homeworks mapped to the exercises in the Student Book		
GCSE Mathematics Online	<ul style="list-style-type: none">• Student Book chapter PDF• Lesson notes• 6 worksheets (+ solutions)• 9 animated widgets	<ul style="list-style-type: none">• 15 interactive walkthroughs• 5 auto-marked quickfire quizzes• 5 auto-marked question sets, each with four levels• Auto-marked chapter quiz	
Vocabulary consecutive, prime factor, whole number			

Suggested teaching time: 5 hours

Required previous learning

KS3 Maths

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5 Working with fractions (Foundation)

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Prerequisite for chapters

13 Percentages

14 Powers and roots

26 Ratio

27 Proportion

Student Book	Learning outcomes	DfE subject content references	
		Standard	Underlined
Section 1: Equivalent fractions	<ul style="list-style-type: none"> To apply knowledge of factors and multiples to simplify fractions and identify equivalent fractions 	N3	
Section 2: Using the four operations with fractions	<ul style="list-style-type: none"> To apply the four operations to fractions To apply knowledge of the four operations to solving problems involving fractions 	N2	
		N8	
Section 3: Fractions of quantities	<ul style="list-style-type: none"> To calculate fractions of amounts To express one number as a fraction of another 	N12	
		R3	

Other resources

[Assessment](#)

Problem-solving Book

Chapter 2 Q17, Chapter 3 Q10, Chapter 5 Qs 1, 2, 3, Chapter 7 Qs2, 18

Homework Book

5 Homeworks mapped to the exercises in the Student Book

GCSE Mathematics Online

- | | |
|--|---|
| <ul style="list-style-type: none"> • Student Book chapter PDF • Lesson notes • 6 worksheets (+ solutions) • 5 animated widgets | <ul style="list-style-type: none"> • 8 interactive walkthroughs • 3 auto-marked quickfire quizzes • 3 auto-marked question sets, each with four levels • Auto-marked chapter quiz |
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Vocabulary common denominator, numerator, reciprocal

Suggested teaching time: 4 hours

Required previous learning

KS3 Maths

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6 Working with decimals (Foundation)

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Prerequisite for chapters

12 Rounding and estimation

13 Percentages

15 Standard form

21 Units and measure

Student Book	Learning outcomes	DfE subject content references	
		Standard	Underlined
Section 1: Review of decimals and fractions	<ul style="list-style-type: none"> To apply knowledge of place value to convert decimals to fractions and order fractions 	N10	
Section 2: Calculating with decimals	<ul style="list-style-type: none"> To apply knowledge of rounding to estimate answers to calculations that involve decimals To be able to add, subtract, multiply and divide decimals To use a calculator to complete more complicated calculations that involve decimals 	N2	
Other resources			
Problem-solving Book	Chapter 6 Q3, Chapter 8 Q9, Chapter 10 Q13		
Homework Book	6 Homeworks mapped to the exercises in the Student Book		
GCSE Mathematics Online	<ul style="list-style-type: none"> Student Book chapter PDF Lesson notes 5 worksheets (+ solutions) 9 animated widgets 	<ul style="list-style-type: none"> 9 interactive walkthroughs 2 auto-marked quickfire quizzes 2 auto-marked question sets, each with four levels Auto-marked chapter quiz 	

Suggested teaching time: 6 hours

Required previous learning

4 Properties of integers

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**7 Basic algebra
(Foundation)**

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Prerequisite for chapters

16 Further algebra

21 Units and measurement

27 Proportion

Student Book	Learning outcomes	DfE subject content references	
		Standard	Underlined
Section 1: Algebraic notation	<ul style="list-style-type: none"> To interpret and work with algebraic notation including an understanding of correct, formal language and notation To form algebraic expressions from worded instructions and geometric problems To substitute to evaluate algebraic expressions for a given value 	A3	
		A6	
Section 2: Simplifying expressions	<ul style="list-style-type: none"> To simplify algebraic expressions by collecting like terms To simplify products and quotients 	A1	
		A3	
		A4	
		N3	
Section 3: Expanding brackets	<ul style="list-style-type: none"> To expand the product of a single term and binomial 	A1	
		A3	
		A4	
Section 4: Factorising expressions	<ul style="list-style-type: none"> To factorise out common factors and recognise that the HCF must be factored out for an expression to be fully factorised 	A1	
		A3	
		A4	

7 Basic algebra (continued)

Section 5: Solving problems using algebra	<ul style="list-style-type: none"> To form expressions from word problems and use algebra to solve problems in different contexts including number problems 	A1		
		A2		
		A3		
		A4		
		A5		
		A6		

Other resources

Problem-solving Book	Chapter 4 Q1, Chapter 7 Q12		
Homework Book	7 Homeworks mapped to the exercises in the Student Book		
GCSE Mathematics Online	<ul style="list-style-type: none"> Student Book chapter PDF Lesson notes 11 worksheets (+ solutions) 12 animated widgets 	<ul style="list-style-type: none"> 16 interactive walkthroughs 5 auto-marked quickfire quizzes 5 auto-marked question sets, each with four levels Auto-marked chapter quiz 	

Vocabulary variable, expression, term, expanding

Suggested teaching time: 6 hours

Required previous learning

KS3 Maths

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8 Properties of polygons and 3D objects (Foundation)

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Prerequisite for chapters

9 Angles

10 Perimeter

11 Area

32 Construction and loci

Student Book	Learning outcomes	DfE subject content references	
		Standard	Underlined
Section 1: Types of shapes	<ul style="list-style-type: none"> To know the names and features of common polygons and polyhedrals To know how to describe and label common features (congruent, parallel, etc.) of plane figures 	G1	
		G9	
		G12	
Section 2: Symmetry	<ul style="list-style-type: none"> To identify and describe line and rotational symmetry in plane figures 	G1	
		G4	
Section 3: Triangles	<ul style="list-style-type: none"> To know and use properties of triangles, including their interior angle sum 	G4	
		G6	
Section 4: Quadrilaterals	<ul style="list-style-type: none"> To know and use properties of quadrilaterals, including their interior angle sum 	G4	
		G6	
Section 5: Properties of 3D objects	<ul style="list-style-type: none"> To know and use properties of 3D solids 	G12	

8 Properties of polygons and 3D objects (continued)

Other resources

Problem-solving Book

Chapter 3 Q1, Chapter 8 Q10, Chapter 9 Q12

Homework Book

7 Homeworks mapped to the exercises in the Student Book

GCSE Mathematics Online

- Student Book chapter PDF
- Lesson notes
- 12 worksheets (+ solutions)
- 13 animated widgets
- 11 interactive walkthroughs
- 5 auto-marked quickfire quizzes
- 5 auto-marked question sets, each with four levels
- Auto-marked chapter quiz

Vocabulary plane shape, polygon, regular polygon, irregular polygon, polyhedron, reflection, line of symmetry, rotational symmetry, adjacent, bisect, congruent, equidistant

Suggested teaching time: 7 hours

Required previous learning

KS3 Maths

9 Angles (Foundation)

Prerequisite for chapters

20 3D objects

22 Formulae

31 Transformations in a plane

33 Similarity

34 Congruence

35 Pythagoras' theorem

Student Book	Learning outcomes	DfE subject content references		
			Standard	Underlined
Section 1: Angle facts	<ul style="list-style-type: none"> To recall knowledge of basic angle facts including: vertically opposite angles, angles on a line and angles around a point To apply basic and parallel angle facts to find the size of angles in various scenarios 	G1		
		G3		
		G6		
Section 2: Parallel lines and angles	<ul style="list-style-type: none"> To recall knowledge of parallel line angle facts including: corresponding angles, alternate angles and co-interior angles To apply basic and parallel angle facts to find the size of angles in various scenarios 	G3		
		G6		
Section 3: Angles in triangles	<ul style="list-style-type: none"> To understand a proof for the sum of the interior angles of a triangle being 180 degrees To understand a proof for the exterior angle of a triangle being equal to the sum of the opposite interior angles 	G3		
		G6		
Section 4: Angles in polygons	<ul style="list-style-type: none"> To calculate the sum of the interior angles of any polygon To calculate the size of a single interior angle of a regular polygon To calculate the size of a single exterior angle of a regular polygon 	G3		
		G6		

9 Angles (continued)

Other resources

Problem-solving Book

Chapter 2 Qs 3, 18, Chapter 3 Qs 2, 11, Chapter 8 Q11

Homework Book

6 Homeworks mapped to the exercises in the Student Book

GCSE Mathematics Online

- Student Book chapter PDF
- Lesson notes
- 10 worksheets (+ solutions)
- 7 animated widgets
- 10 interactive walkthroughs
- 4 auto-marked quickfire quizzes
- 4 auto-marked question sets, each with four levels
- Auto-marked chapter quiz

Vocabulary vertically opposite angles, transversal, corresponding angles, alternate angles, co-interior angles, interior angles, exterior angles

Suggested teaching time: 5 hours

Required previous learning

8 Properties of polygons and 3D objects

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10 Perimeter (Foundation)

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Prerequisite for chapters

The content in this chapter is not prerequisite knowledge for any other chapters

Student Book	Learning outcomes	DfE subject content references	
		Standard	Underlined
Section 1: Perimeter of simple and composite shapes	<ul style="list-style-type: none"> To calculate the perimeter of a given simple shape, including the use of properties of triangles, quadrilaterals and regular polygons To understand that the perimeter of a shape is its boundary and what a boundary is for a composite shape where a smaller shape has been removed from the centre of a larger shape To calculate the perimeter of composite shapes To form expressions and equations for the perimeter of a given shape and solve these equations to find unknown lengths 	G17	
Section 2: Circumference of a circle	<ul style="list-style-type: none"> To know and use a formula (either $C = \pi D$ or $C = 2\pi r$) for the circumference of a circle to find the value of one variable given any other, e.g. D given C To be able to find the arc length of a given sector and hence the perimeter of this shape 	N8	
		G9	
		G17	
		G18	
Section 3: Problems involving perimeter and circumference	<ul style="list-style-type: none"> To use known perimeter formulae from section 1 and 2 to solve contextual problems 	G17	

10 Perimeter (continued)

Other resources

Problem-solving Book

Chapter 1 Qs 3, 8, Chapter 2 Qs 4, 5, 20, Chapter 3 Q4, Chapter 4 Q2, Chapter 9 Q4, Chapter 10 Q2

Homework Book

6 Homeworks mapped to the exercises in the Student Book

GCSE Mathematics Online

- Student Book chapter PDF
- Lesson notes
- 3 worksheets (+ solutions)
- 2 animated widgets
- 7 interactive walkthroughs
- 2 auto-marked quickfire quizzes
- 2 auto-marked question sets, each with four levels
- Auto-marked chapter quiz

Vocabulary perimeter

Suggested teaching time: 7 hours

Required previous learning

4 Properties of integers
8 Properties of polygons and 3D objects

**11 Area
(Foundation)**

Prerequisite for chapters

23 Volume and surface area

Student Book	Learning outcomes	Specification references	
		Standard	Underlined
Section 1: Area of polygons	<ul style="list-style-type: none"> To know and use the formulae for calculating the area of rectangles, triangles, parallelograms and trapeziums To identify how composite shapes have been formed using these four shapes and use the formulae to calculate the total area of the composite shape 	G16	
Section 2: Area of circles and sectors	<ul style="list-style-type: none"> To know and use the formula for calculating the area of a circle To adapt this formula to find the area of a sector given the angle formed at the centre between the radii using fractions of the whole 	N8	
		G9	
		G17	
		G18	
Section 3: Area of composite shapes	<ul style="list-style-type: none"> To split composite shapes into the sum of known shapes from sections 1 and 2 To recognise that the area of some composite shapes can be found by subtracting known areas from a larger shape 	G17	
		G18	

11 Area (continued)

Other resources

Problem-solving Book	Chapter 2 Qs 7, 8, Chapter 3 Q12, Chapter 4 Q13, Chapter 5 Q7, Chapter 6 Q2, Chapter 7 Qs3, 4, Chapter 8 Q12, Chapter 9 Q13
Homework Book	6 Homeworks mapped to the exercises in the Student Book
GCSE Mathematics Online	<ul style="list-style-type: none">• Student Book chapter PDF• Lesson notes• 7 worksheets (+ solutions)• 5 animated widgets• 12 interactive walkthroughs• 4 auto-marked quickfire quizzes• 4 auto-marked question sets, each with four levels• Auto-marked chapter quiz

Vocabulary sectors, composite shapes

Suggested teaching time: 4 hours

Required previous learning

- 1 Working with integers
- 4 Properties of integers
- 6 Working with decimals

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12 Rounding and estimation (Foundation)

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Prerequisite for chapters

- 15 Standard form
- 36 Trigonometry

Student Book	Learning outcomes	DfE subject content references	
		Standard	Underlined
Section 1: Approximate values	<ul style="list-style-type: none"> • To be able to round to the nearest positive integer power of ten and apply this to some real-life examples • To round values to a specified number of decimal places • To round values to a specified number of significant figures • To truncate values and understand when this is useful to apply in context 	N15	
Section 2: Approximation and estimation	<ul style="list-style-type: none"> • To apply the ability to round to one significant figure in order to estimate answers to more complex calculations without using a calculator 	N14	
Section 3: Limits of accuracy	<ul style="list-style-type: none"> • To use inequalities and identify the lower and upper bounds for measurements and use these within calculations to find maximum and minimum solutions 	N15	
		N16	

Other resources	
Problem-solving Book	Chapter 4 Q11, Chapter 5 Q4, Chapter 6 Q8, Chapter 7 Q5
Homework Book	7 Homeworks mapped to the exercises in the Student Book
GCSE Mathematics Online	<ul style="list-style-type: none"> • Student Book chapter PDF • Lesson notes • 6 worksheets (+ solutions) • 3 animated widgets <ul style="list-style-type: none"> • 12 interactive walkthroughs • 5 auto-marked quickfire quizzes • 5 auto-marked question sets, each with four levels • Auto-marked chapter quiz

Vocabulary rounding, degree of accuracy, significant figure, round to significant figures, truncation, estimate, lower bound, upper bound, error intervals

Suggested teaching time: 5 hours

Required previous learning

- 5 Working with fractions
- 6 Working with decimals

**13 Percentages
(Foundation)**

Prerequisite for chapters

- 19 Basic probability
- 38 Growth and decay

Student Book	Learning outcomes	Specification references		
			Standard	Underlined
Section 1: Review of percentages	<ul style="list-style-type: none"> • To be able to convert between fractions, decimals and percentages 	R9		
		N1		
		N2		
Section 2: Percentage calculations	<ul style="list-style-type: none"> • To use fractions, multipliers or calculators to work out percentages of amounts • To be able to express a quantity as a percentage of another 	R9		
		N12		
Section 3: Percentage change	<ul style="list-style-type: none"> • To calculate percentage increase or decrease • To calculate the original amount given the value after an increase or decrease 	N1		
		R9		
		N12		
Other resources				
Problem-solving Book	Chapter 4 Q4, Chapter 6 Q9, Chapter 7 Q19, Chapter 8 Q19			
Homework Book	6 Homeworks mapped to the exercises in the Student Book			
GCSE Mathematics Online	<ul style="list-style-type: none"> • Student Book chapter PDF • Lesson notes • 11 worksheets (+ solutions) • 6 animated widgets <ul style="list-style-type: none"> • 12 interactive walkthroughs • 6 auto-marked quickfire quizzes • 6 auto-marked question sets, each with four levels • Auto-marked chapter quiz 			

Suggested teaching time: 4 hours

Required previous learning

- 1 Working with integers
- 5 Working with fractions

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14 Powers and roots (Foundation)

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Prerequisite for chapters

- 15 Standard form
- 37 Graphs of other functions and equations

Student Book	Learning outcomes	Specification references		
			Standard	Underlined
Section 1: Index notation	<ul style="list-style-type: none"> • To write a series of numbers multiplied together in index form • To write an exponent on a calculator • To understand zero and negative indices 	N6		
		N7		
Section 2: The laws of indices	<ul style="list-style-type: none"> • To apply the laws of indices for multiplying and dividing, and for powers of indices 	N7		
		A4		
Section 3: Working with powers and roots	<ul style="list-style-type: none"> • To calculate roots of a number • To solve problems involving powers and roots 	N6		
		N7		

Other resources

Problem-solving Book	Chapter 4 Q5, Chapter 7 Q13, Chapter 8 Q20, Chapter 9 Q20
Homework Book	8 Homeworks mapped to the exercises in the Student Book
GCSE Mathematics Online	<ul style="list-style-type: none"> • Student Book chapter PDF • Lesson notes • 8 worksheets (+ solutions) • 2 animated widgets <ul style="list-style-type: none"> • 10 interactive walkthroughs • 3 auto-marked quickfire quizzes • 3 auto-marked question sets, each with four levels • Auto-marked chapter quiz

Vocabulary index, index notation

Suggested teaching time: 3 hours

Required previous learning

- 6 Working with decimals
- 12 Rounding and estimation
- 14 Powers and roots

**15 Standard form
(Foundation)**

Prerequisite for chapters

The content in this chapter is not prerequisite knowledge for any other chapters

Student Book	Learning outcomes	Specification references	
		Standard	Underlined
Section 1: Expressing numbers in standard form	<ul style="list-style-type: none"> • To apply understanding of multiplying and dividing by powers of ten to convert numbers to and from standard form 	N9	
Section 2: Calculators and standard form	<ul style="list-style-type: none"> • To use a scientific calculator efficiently for standard form calculations 	N9	
Section 3: Working in standard form	<ul style="list-style-type: none"> • To apply the laws of indices to multiply and divide numbers in standard form without the use of a calculator • To apply understanding of place value, and previously learned conversion between standard form and ordinary numbers, to add and subtract numbers in standard form • To solve problems, including contextualised ones, involving standard form 	N9	

Other resources

Problem-solving Book	Chapter 7 Q20, Chapter 10 Q14	
Homework Book	7 Homeworks mapped to the exercises in the Student Book	
GCSE Mathematics Online	<ul style="list-style-type: none"> • Student Book chapter PDF • Lesson notes • 3 worksheets (+ solutions) • 2 animated widgets 	<ul style="list-style-type: none"> • 7 interactive walkthroughs • 2 auto-marked quickfire quizzes • 2 auto-marked question sets, each with four levels • Auto-marked chapter quiz

Vocabulary place value, indices, standard form

Suggested teaching time: 7 hours

Required previous learning

- 1 Working with integers
- 7 Basic algebra

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16 Further algebra (Foundation)

>

Prerequisite for chapters

17 Equations

Student Book	Learning outcomes	DfE subject content references		
			Standard	Underlined
Section 1: Multiplying two binomials	<ul style="list-style-type: none"> • To know what a quadratic expression is • To be able to expand the product of two binomials 	A1		
		A3		
		A4		
Section 2: Factorising quadratic expressions	<ul style="list-style-type: none"> • To be able to factorise expressions of the form $ax^2 + bx + c$ 	A1		
		A3		
		A4		
Section 3: Apply your skills	<ul style="list-style-type: none"> • To form algebraic expressions to solve problems 	A4		

Other resources

Problem-solving Book	Chapter 1 Q9, Chapter 2 Q9		
Homework Book	6 Homeworks mapped to the exercises in the Student Book		
GCSE Mathematics Online	<ul style="list-style-type: none"> • Student Book chapter PDF • Lesson notes • 9 worksheets (+ solutions) • 5 animated widgets 	<ul style="list-style-type: none"> • 11 interactive walkthroughs • 4 auto-marked quickfire quizzes • 4 auto-marked question sets, each with four levels • Auto-marked chapter quiz 	

Vocabulary binomial, binomial product, quadratic expression, trinomial, perfect square, coefficient, constant

Suggested teaching time: 9 hours

Required previous learning

- 1 Working with integers
- 16 Further algebra

**17 Equations
(Foundation)**

Prerequisite for chapters

- 22 Formulae
- 25 Inequalities
- 27 Proportion
- 28 Graphs of linear functions
- 30 Vector geometry
- 33 Similarity

Student Book	Learning outcomes	DfE subject content references	
		Standard	Underlined
Section 1: Linear equations	<ul style="list-style-type: none"> • To solve linear equations • To understand that identities are equations for which there are an infinite number of solutions as they are true for all values x can take 	A3	
		A17	
		A21	
Section 2: Quadratic equations	<ul style="list-style-type: none"> • To form and solve quadratic equations • To understand that different types of equations have a different possible number of solutions 	A18	
Section 3: Simultaneous equations	<ul style="list-style-type: none"> • To solve linear simultaneous equations 	A19	
		A21	
Section 4: Using graphs to solve equations	<ul style="list-style-type: none"> • To know how to read and interpret graphs in various contexts • To be able to use graphs to find approximate solutions to equations 	A11	
		A17	
		A18	
		A19	

17 Equations (continued)

Other resources

Problem-solving Book

Chapter 2 Q19, Chapter 3 Q5, Chapter 6 Qs 3, 10, Chapter 8 Qs 21, 22, Chapter 10 Q8

Homework Book

10 Homeworks mapped to the exercises in the Student Book

GCSE Mathematics Online

- Student Book chapter PDF
- Lesson notes
- 14 worksheets (+ solutions)
- 9 animated widgets
- 19 interactive walkthroughs
- 6 auto-marked quickfire quizzes
- 6 auto-marked question sets, each with four levels
- Auto-marked chapter quiz

Vocabulary unknown, variable, linear equation, roots, solution, simultaneous equations

Suggested teaching time: 7 hours

Required previous learning

4 Properties of integers

>

18 Functions and sequences (Foundation)

>

Prerequisite for chapters

28 Graphs of linear functions

Student Book	Learning outcomes	DfE subject content references	
		Standard	Underlined
Section 1: Sequences and patterns	<ul style="list-style-type: none"> To identify a term-to-term rule To generate terms of a sequence from a term-to-term rule 	A23	
		A25	
Section 2: Finding the n th term	<ul style="list-style-type: none"> To generate terms of a sequence from a position-to-term rule To find the nth term of a linear sequence 	A23	
		A25	
Section 3: Functions	<ul style="list-style-type: none"> To generate terms of a sequence from a function rule To interpret expressions as functions with inputs and outputs 	A7	
Section 4: Special sequences	<ul style="list-style-type: none"> To identify special sequences 	A24	

Other resources

Problem-solving Book

Chapter 8 Q13, Chapter 9 Q5

Homework Book

6 Homeworks mapped to the exercises in the Student Book

GCSE Mathematics Online

- | | |
|--|---|
| <ul style="list-style-type: none"> • Student Book chapter PDF • Lesson notes • 7 worksheets (+ solutions) • 4 animated widgets | <ul style="list-style-type: none"> • 8 interactive walkthroughs • 3 auto-marked quickfire quizzes • 3 auto-marked question sets, each with four levels • Auto-marked chapter quiz |
|--|---|

Vocabulary sequence, term, consecutive terms, first difference, term-to-term rule, arithmetic sequence, geometric sequence, position-to-term rule, function

Suggested teaching time: 3 hours

Required previous learning

13 Percentages

>

19 Basic probability (Foundation)

>

Prerequisite for chapters

24 Further probability

Student Book	Learning outcomes	DfE subject content references		
			Standard	Underlined
Section 1: The probability scale	<ul style="list-style-type: none"> To understand and use the vocabulary of probability To express probabilities as a number between 0 (impossible) and 1 (certain), either as a decimal, fraction or percentage 	P1		
		P2		
		P3		
Section 2: Calculating probability	<ul style="list-style-type: none"> To understand that outcomes are equally likely if there is the same chance of each outcome occurring To calculate the theoretical probability of a desired outcome To calculate the probability of an event NOT happening 	P3		
		P5		
Section 3: Experimental probability	<ul style="list-style-type: none"> To relate relative frequency to theoretical probability To represent and analyse outcomes of probability experiments To use tables and frequency trees to organise outcomes 	P1		
		P6		
Section 4: Mixed probability problems	<ul style="list-style-type: none"> To calculate probabilities in different contexts 	P2		
		P7		

Other resources

Problem-solving Book

Chapter 2 Q10, Chapter 5 Q5, Chapter 6 Qs 4, 5, Chapter 8 Qs 2, 3, 4, Chapter 9 Qs 6, 7, 14, 15, 16

Homework Book

7 Homeworks mapped to the exercises in the Student Book

GCSE Mathematics Online

- | | |
|--|--|
| <ul style="list-style-type: none"> Student Book chapter PDF Lesson notes 15worksheets (+ solutions) 7 animated widgets | <ul style="list-style-type: none"> 13 interactive walkthroughs 6 auto-marked quickfire quizzes 6 auto-marked question sets, each with four levels Auto-marked chapter quiz |
|--|--|

Vocabulary event, outcome, equally likely, random, mutually exclusive

Suggested teaching time: 4 hours

Required previous learning

9 Angles

>

20 3D objects (Foundation)

>

Prerequisite for chapters

23 Volume and surface area

Student Book	Learning outcomes	DfE subject content references		
			Standard	Underlined
Section 1: 3D objects and their nets	<ul style="list-style-type: none"> To apply what you already know about the properties of 3D objects 	G12		
Section 2: Drawing 3D objects	<ul style="list-style-type: none"> To work with 2D representations of 3D objects 	G13		
Section 3: Plan and elevation views	<ul style="list-style-type: none"> To construct and interpret plans and elevations of 3D objects 	G1		
		G13		

Other resources

Problem-solving Book	Chapter 8 Q14
Homework Book	4 Homeworks mapped to the exercises in the Student Book
GCSE Mathematics Online	<ul style="list-style-type: none"> Student Book chapter PDF Lesson notes 8 worksheets (+ solutions) 3 animated widgets 4 interactive walkthroughs 2 auto-marked quickfire quizzes 2 auto-marked question sets, each with four levels Auto-marked chapter quiz

Vocabulary isometric grid, plan view, elevation view

Suggested teaching time: 6 hours

Required previous learning

- 6 Working with decimals
- 7 Basic algebra

**21 Units and measure
(Foundation)**

Prerequisite for chapters

22 Formulae

Student Book	Learning outcomes	DfE subject content references		
			Standard	Underlined
Section 1: Standard units of measurement	<ul style="list-style-type: none"> • To convert metric units for capacity, mass and length • To convert metric units of area and volume • To understand units of time are not metric • To convert units of time and solve related problems • To convert currencies using scale factors 	N13		
		R1		
		G14		
Section 2: Compound units of measurement	<ul style="list-style-type: none"> • To convert compound measurements • To use formulae: speed = distance/time, density = mass/volume, pressure = force/area, to find any one of the variables given values for the other two 	N13		
		R1		
		R11		
		G14		
Section 3: Maps, scale drawings and bearings	<ul style="list-style-type: none"> • To read and use scales on maps including both line/bar scales and ratio scales • To form scales to construct scale drawings to fit a given dimension • To read and use bearings in scale drawings 	R2		
		G15		

Other resources

Problem-solving Book

Chapter 2 Q11, Chapter 5 Qs 6, 8, Chapter 7 Qs 6, 14, 15, Chapter 8 Q23, Chapter 10 Qs 3, 4, 15

Homework Book

8 Homeworks mapped to the exercises in the Student Book

GCSE Mathematics Online

- | | |
|---|--|
| <ul style="list-style-type: none"> • Student Book chapter PDF • Lesson notes • 10 worksheets (+ solutions) • 4 animated widgets | <ul style="list-style-type: none"> • 14 interactive walkthroughs • 5 auto-marked quickfire quizzes • 5 auto-marked question sets, each with four levels • Auto-marked chapter quiz |
|---|--|

Vocabulary conversion factor, exchange rate, scale factor

Suggested teaching time: 6 hours

Required previous learning

- 9 Angles
- 17 Equations
- 21 Units and measure

**22 Formulae
(Foundation)**

Prerequisite for chapters

- 29 Interpreting graphs

Student Book	Learning outcomes	DfE subject content references	
		Standard	Underlined
Section 1: Writing formulae	<ul style="list-style-type: none"> • To write formulae to represent real life contexts 	A3	
		A5	
		A21	
		R10	
Section 2: Substituting values into formulae	<ul style="list-style-type: none"> • To substitute numerical values into formulae • To use formulae from the topic of kinematics 	A2	
		A4	
		A5	
Section 3: Changing the subject of a formula	<ul style="list-style-type: none"> • To rearrange formulae to change the subject 	A4	
		A5	
Section 4: Working with formulae	<ul style="list-style-type: none"> • To work with formulae in a variety of contexts 	A2	
		A3	
		A5	

22 Formulae (continued)

Other resources

Problem-solving Book

Chapter 5 Q9, Chapter 6 Qs 11, 12, Chapter 7 Q16, Chapter 8 Q5, Chapter 10 Q9

Homework Book

6 Homeworks mapped to the exercises in the Student Book

GCSE Mathematics Online

- Student Book chapter PDF
- Lesson notes
- 3 worksheets (+ solutions)
- 1 animated widget
- 5 interactive walkthroughs
- 3 auto-marked quickfire quizzes
- 3 auto-marked question sets, each with four levels
- Auto-marked chapter quiz

Vocabulary formula, subject, substitute, evaluate

Suggested teaching time: 6 hours

Required previous learning

11 Area
20 3D objects

>

**23 Volume
and surface area
(Foundation)**

>

Prerequisite for chapters

The content in this chapter is not prerequisite knowledge for any other chapters.

Student Book	Learning outcomes	DfE subject content references		
			Standard	Underlined
Section 1: Prisms and cylinders	<ul style="list-style-type: none"> To calculate the volume of prisms (including cylinders) To calculate the surface area of prisms (including cylinders) 	G16		
		G17		
Section 2: Cones and spheres	<ul style="list-style-type: none"> To calculate the volume and surface area of a cone To calculate the volume and surface area of a sphere To calculate the volume and surface area of composite 3D shapes 	N8		
		G17		
Section 3: Pyramids	<ul style="list-style-type: none"> To find the volume and surface area of a pyramid 	G17		

Other resources

Problem-solving Book	Chapter 1 Qs 4, 5, 10, Chapter 2 Qs 12, 13, 14, Chapter 4 Qs 3, 6, Chapter 5 Q10, Chapter 10 Q10		
Homework Book	5 Homeworks mapped to the exercises in the Student Book		
GCSE Mathematics Online	<ul style="list-style-type: none"> Student Book chapter PDF Lesson notes 12 worksheets (+ solutions) 11 animated widgets 	<ul style="list-style-type: none"> 21 interactive walkthroughs 6 auto-marked quickfire quizzes 6 auto-marked question sets, each with four levels Auto-marked chapter quiz 	

Vocabulary right prism

Suggested teaching time: 5 hours

Required previous learning

19 Basic probability

>

**24 Further probability
(Foundation)**

>

Prerequisite for chapters

The content in this chapter is not prerequisite knowledge for any other chapters.

Student Book	Learning outcomes	DfE subject content references		
			Standard	Underlined
Section 1: Combined events	<ul style="list-style-type: none"> To construct and use representations (tables, tree diagrams and Venn diagrams) To use the language and notation of basic set theory 	N5		
		P6		
		P7		
Section 2: Theoretical probability of combined events	<ul style="list-style-type: none"> To use the addition rule, including an understanding of mutually exclusive events To use the multiplication rule, including an understanding of independent events 	P4		
		P8		

Other resources

Problem-solving Book Chapter 1 Qs 11, 12, 21, 22, Chapter 4 Q7, Chapter 6 Qs 13, 14, Chapter 7 Q17, Chapter 9 Qs 17, 18, Chapter 10 Qs 16, 17

Homework Book 6 Homeworks mapped to the exercises in the Student Book

<p>GCSE Mathematics Online</p> <ul style="list-style-type: none"> Student Book chapter PDF Lesson notes 6 worksheets (+ solutions) 2 animated widgets 	<ul style="list-style-type: none"> 9 interactive walkthroughs 2 auto-marked quickfire quizzes 2 auto-marked question sets, each with four levels Auto-marked chapter quiz
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Vocabulary combined events, sample space, independent events, dependent events

Suggested teaching time: 5 hours

Required previous learning

4 Properties of integers
17 Equations

>

**25 Inequalities
(Foundation)**

>

Prerequisite for chapters

The content in this chapter is not prerequisite knowledge for any other chapters.

Student Book	Learning outcomes	DfE subject content references	
		Standard	Underlined
Section 1: Expressing inequalities	<ul style="list-style-type: none"> To understand and interpret inequalities and use the correct symbols to express inequalities 	N1	
		A3	
		A22	
Section 2: Number lines	<ul style="list-style-type: none"> To use a number line to represent an inequality 	N1	
		A3	
		A22	
Section 3: Solving inequalities	<ul style="list-style-type: none"> To solve linear inequalities in one variable and represent the solution set on a number line 	N1	
		A3	
		A22	
Section 4: Working with inequalities	<ul style="list-style-type: none"> To solve problems involving inequalities 	A3	
		A22	

25 Inequalities (continued)

Other resources

Problem-solving Book

Chapter 2 Q15

Homework Book

5 Homeworks mapped to the exercises in the Student Book

GCSE Mathematics Online

- Student Book chapter PDF
- Lesson notes
- 4 worksheets (+ solutions)
- 3 animated widgets
- 6 interactive walkthroughs
- 2 auto-marked quickfire quizzes
- 2 auto-marked question sets, each with four levels
- Auto-marked chapter quiz

Vocabulary inequality, number line

Suggested teaching time: 5 hours

Required previous learning

5 Working with fractions

>

26 Ratio (Foundation)

>

Prerequisite for chapters

33 Similarity

36 Trigonometry

Student Book	Learning outcomes	DfE subject content references		
			Standard	Underlined
Section 1: Introducing ratios	<ul style="list-style-type: none"> To use ratio notation to write ratios for diagrams and word statements and to simplify ratios 	R4		
		R5		
		R7		
Section 2: Sharing in a given ratio	<ul style="list-style-type: none"> To divide a quantity into two or more parts given a specified ratio and to write the division of quantities into parts as a ratio 	R5		
		R6		
Section 3: Comparing ratios	<ul style="list-style-type: none"> To use a unitary method to solve ratio and proportion problems and relate ratios to fractions and linear functions in order to solve problems, including real-life ones such as conversions and scaling 	R5		
		R7		
		R8		
		N11		

Other resources

Problem-solving Book	Chapter 1 Qs 6, 13, Chapter 2 Q6, Chapter 6 Qs 6, 15, 16, 17, Chapter 7 Q7, Chapter 8 Q15, Chapter 10 Q11		
Homework Book	6 Homeworks mapped to the exercises in the Student Book		
GCSE Mathematics Online	<ul style="list-style-type: none"> Student Book chapter PDF Lesson notes 4 worksheets (+ solutions) 2 animated widgets 	<ul style="list-style-type: none"> 6 interactive walkthroughs 2 auto-marked quickfire quizzes 2 auto-marked question sets, each with four levels Auto-marked chapter quiz 	

Vocabulary ratio, proportion, equivalent

Suggested teaching time: 4 hours

Required previous learning

- 5 Working with fractions
- 7 Basic algebra
- 17 Equations

>

27 Proportion (Foundation)

>

Prerequisite for chapters

The content in this chapter is not prerequisite knowledge for any other chapters.

Student Book	Learning outcomes	DfE subject content references	
		Standard	Underlined
Section 1: Direct proportion	<ul style="list-style-type: none"> • To use direct proportion to solve problems • To use the unitary method to solve proportion problems 	R7	
		R10	
		R13	
Section 2: Algebraic and graphical representations	<ul style="list-style-type: none"> • To solve direct proportion questions graphically • To solve direct proportion questions using algebraic manipulation 	R7	
		R10	
		R13	
Section 3: Inverse proportion	<ul style="list-style-type: none"> • To solve inverse proportion questions, based on $y = 1/x$ 	R10	
		R13	

Other resources

Problem-solving Book

Chapter 6 Q21, Chapter 7 Q8

Homework Book

5 Homeworks mapped to the exercises in the Student Book

GCSE Mathematics Online

- | | |
|--|---|
| <ul style="list-style-type: none"> • Student Book chapter PDF • Lesson notes • 7 worksheets (+ solutions) • 5 animated widgets | <ul style="list-style-type: none"> • 6 interactive walkthroughs • 3 auto-marked quickfire quizzes • 3 auto-marked question sets, each with four levels • Auto-marked chapter quiz |
|--|---|

Vocabulary ratio, direct proportion, mathematical model, inverse proportion

Suggested teaching time: 5 hours

Required previous learning

- 17 Equations
- 18 Functions and sequences

>

28 Graphs of linear functions (Foundation)

>

Prerequisite for chapters

- 31 Transformations in a plane
- 37 Graphs of other functions and equations

Student Book	Learning outcomes	DfE subject content references		
			Standard	Underlined
Section 1: Plotting graphs	<ul style="list-style-type: none"> • To use a table of values to plot graphs of linear functions 	A8		
		A9		
Section 2: Gradient and intercepts of straight-line graphs	<ul style="list-style-type: none"> • To identify the main features of straight-line graphs and use them to sketch graphs • To sketch graphs from linear equations in the form of $y = mx + c$ • To find the equation of a straight line using gradient and points on the line 	A9		
		A10		
		A12		
		A22		
Section 3: Parallel lines	<ul style="list-style-type: none"> • To identify lines that are parallel by considering their equations • To find the equation of a line parallel to a given line (perhaps passing through a known point) 	A9		
Section 4: Working with straight-line graphs	<ul style="list-style-type: none"> • To solve problems involving straight-line graphs 	A9		
		A10		
		A12		
		G11		

28 Graphs of linear functions (continued)

Other resources

Problem-solving Book

Chapter 5 Q11

Homework Book

7 Homeworks mapped to the exercises in the Student Book

GCSE Mathematics Online

- Student Book chapter PDF
- Lesson notes
- 20 worksheets (+ solutions)
- 10 animated widgets
- 25 interactive walkthroughs
- 9 auto-marked quickfire quizzes
- 9 auto-marked question sets, each with four levels
- Auto-marked chapter quiz

Vocabulary function, coordinates, gradient, y -intercept, x -intercept, coefficient, constant

Suggested teaching time: 5 hours

Required previous learning

22 Formulae

>

29 Interpreting graphs (Foundation)

>

Prerequisite for chapters

The content in this chapter is not prerequisite knowledge for any other chapters.

Student Book	Learning outcomes	DfE subject content references		
			Standard	Underlined
Section 1: Graphs of real-world contexts	<ul style="list-style-type: none"> To construct and interpret graphs in real-world contexts 	A14		
		R10		
		R14		
		S2		
Section 2: Gradients	<ul style="list-style-type: none"> To interpret the gradient of a straight-line graph as a rate of change 	A14		
		R8		
Other resources				
Problem-solving Book	Chapter 1 Qs 15, 19, 23, Chapter 3 Q6, Chapter 4 Qs 8, 14, Chapter 6 Qs 18, 19, Chapter 8 Q16			
Homework Book	3 Homeworks mapped to the exercises in the Student Book			
GCSE Mathematics Online	<ul style="list-style-type: none"> Student Book chapter PDF Lesson notes 5 worksheets (+ solutions) 3 animated widgets 9 interactive walkthroughs 2 auto-marked quickfire quizzes 2 auto-marked question sets, each with four levels Auto-marked chapter quiz 			

Suggested teaching time: 4 hours

Required previous learning

17 Equations

>

30 Vector geometry (Foundation)

>

Prerequisite for chapters

31 Transformations in a plane

Student Book	Learning outcomes	DfE subject content references	
		Standard	Underlined
Section 1: Vector notation and representation	<ul style="list-style-type: none"> To represent vectors as a diagram or a column vector 	G24	
		G25	
Section 2: Vector arithmetic	<ul style="list-style-type: none"> To add and subtract vectors To multiply vectors by a scalar To recognise parallel vectors 	G24	
		G25	

Other resources

Problem-solving Book	Chapter 1 Q16, Chapter 3 Qs 3, 13	
Homework Book	4 Homeworks mapped to the exercises in the Student Book	
GCSE Mathematics Online	<ul style="list-style-type: none"> Student Book chapter PDF Lesson notes 3 worksheets (+ solutions) 	<ul style="list-style-type: none"> 3 interactive walkthroughs 3 auto-marked quickfire quizzes 3 auto-marked question sets, each with four levels Auto-marked chapter quiz

Vocabulary scalar, vector, magnitude, direction, commutative, associative, opposite, parallel, equal

Suggested teaching time: 8 hours

Required previous learning

9 Angles

28 Graphs of linear functions

30 Vector geometry

>

31 Transformations in a plane (Foundation)

>

Prerequisite for chapters

The content in this chapter is not prerequisite knowledge for any other chapters.

Student Book	Learning outcomes	DfE subject content references	
		Standard	Underlined
Section 1: Reflections	<ul style="list-style-type: none"> To carry out, identify and describe reflections 	G7	
Section 2: Translations	<ul style="list-style-type: none"> To carry out, identify and describe translations using 2D vectors 	G7	
Section 3: Rotations	<ul style="list-style-type: none"> To carry out, identify and describe rotations 	G7	
		G24	

Other resources

Problem-solving Book	Chapter 1 Q24, Chapter 5 Q12, Chapter 8 Qs 6, 24, Chapter 10 Q12	
Homework Book	9 Homeworks mapped to the exercises in the Student Book	
GCSE Mathematics Online	<ul style="list-style-type: none"> Student Book chapter PDF Lesson notes 4 worksheets (+ solutions) 2 animated widgets 	<ul style="list-style-type: none"> 3 interactive walkthroughs 1 auto-marked quickfire quiz 1 auto-marked question set, each with four levels Auto-marked chapter quiz

Vocabulary object, image, congruent, mirror line, perpendicular bisector, orientation

Suggested teaching time: 6 hours

Required previous learning

8 Properties of polygons and 3D objects

32 Construction and loci (Foundation)

Prerequisite for chapters

The content in this chapter is not prerequisite knowledge for any other chapters.

Student Book	Learning outcomes	DfE subject content references		
			Standard	Underlined
Section 1: Geometrical instruments	<ul style="list-style-type: none"> To use ruler, protractor and pair of compasses to accurately construct angles and shapes To accurately copy diagrams using rulers and a pair of compasses only 	G2		
		G15		
Section 2: Ruler and compass constructions	<ul style="list-style-type: none"> To construct the perpendicular bisector of a line To construct the perpendicular at a given point on a line To construct a perpendicular from a given point to a line To bisect an angle 	G2		
Section 3: Loci	<ul style="list-style-type: none"> To use constructions to solve loci problems 	G2		
Section 4: Applying your skills	<ul style="list-style-type: none"> To apply appropriate constructions and loci knowledge to a variety of problems including those set in context 	G1		
		G2		

Other resources

Problem-solving Book	Chapter 1 Qs 17, 18, Chapter 10 Q18		
Homework Book	5 Homeworks mapped to the exercises in the Student Book		
GCSE Mathematics Online	<ul style="list-style-type: none"> Student Book chapter PDF Lesson notes 10 worksheets (+ solutions) 5 animated widgets 	<ul style="list-style-type: none"> 3 interactive walkthroughs 3 auto-marked quickfire quizzes 3 auto-marked question sets, each with four levels Auto-marked chapter quiz 	

Vocabulary radius, circumference, semicircle, bisect

Suggested teaching time: 6 hours

Required previous learning

- 9 Angles
- 17 Equations
- 26 Ratio

>

**33 Similarity
(Foundation)**

>

Prerequisite for chapters

The content in this chapter is not prerequisite knowledge for any other chapters.

Student Book	Learning outcomes	DfE subject content references		
			Standard	Underlined
Section 1: Similar triangles	<ul style="list-style-type: none"> • To know what is meant by the phrase 'mathematically similar' • To determine when two objects are mathematically similar 	G6		
		G7		
Section 2: Enlargements	<ul style="list-style-type: none"> • To know what is meant by a 'mathematical enlargement' • To enlarge a shape given a positive rational scale factor • To know what the centre of enlargement is • To enlarge a shape given a scale factor and centre of enlargement • To determine a given centre of enlargement and scale factor from a diagram 	R2		
		R12		
		G7		
Section 3: Similar polygons	<ul style="list-style-type: none"> • To determine similar polygons 	R12		
		G19		

Other resources

Problem-solving Book	Chapter 1 Q19, Chapter 2 Q16, Chapter 3 Q7, Chapter 8 Qs 7, 17		
Homework Book	6 Homeworks mapped to the exercises in the Student Book		
GCSE Mathematics Online	<ul style="list-style-type: none"> • Student Book chapter PDF • Lesson notes • 8 worksheets (+ solutions) • 3 animated widgets 	<ul style="list-style-type: none"> • 6 interactive walkthroughs • 3 auto-marked quickfire quizzes • 3 auto-marked question sets, each with four levels • Auto-marked chapter quiz 	

Vocabulary enlargement, scale factor, centre of enlargement

Suggested teaching time: 5 hours

Required previous learning

9 Angles

>

34 Congruence (Foundation)

>

Prerequisite for chapters

The content in this chapter is not prerequisite knowledge for any other chapters.

Student Book	Learning outcomes	DfE subject content references		
			Standard	Underlined
Section 1: Congruent triangles	<ul style="list-style-type: none"> To know what it means for two objects to be congruent To know the conditions for which congruence for a pair of triangle is then implied: <ul style="list-style-type: none"> SSS – three sides are the same in both triangles ASA – two angles and one side length are the same in both triangles SAS – two sides and the angle between them are the same in both triangle RHS – the hypotenuse and another side of a right-angled triangle are the same in both triangles 	G5		
		G7		
Section 2: Applying congruency	<ul style="list-style-type: none"> To apply the conditions for congruency to a variety of situations 	G6		
		G19		

Other resources

Problem-solving Book

Chapter 1 Q20, Chapter 3 Qs 8, 9, Chapter 8 Q25

Homework Book

3 Homeworks mapped to the exercises in the Student Book

GCSE Mathematics Online

- | | |
|--|---|
| <ul style="list-style-type: none"> Student Book chapter PDF Lesson notes 7 worksheets (+ solutions) 2 animated widgets | <ul style="list-style-type: none"> 6 interactive walkthroughs 2 auto-marked quickfire quizzes 2 auto-marked question sets, each with four levels Auto-marked chapter quiz |
|--|---|

Vocabulary congruent

Suggested teaching time: 6 hours

Required previous learning

4 Properties of integers
9 Angles

>

35 Pythagoras' theorem (Foundation)

>

Prerequisite for chapters

36 Trigonometry

Student Book	Learning outcomes	DfE subject content references		
			Standard	Underlined
Section 1: Finding the length of the hypotenuse	<ul style="list-style-type: none"> To derive Pythagoras' theorem and use it to find the length of the hypotenuse in any right-angled triangle 	G6		
		G20		
Section 2: Finding the length of any side	<ul style="list-style-type: none"> To know and use Pythagoras' theorem to find any missing length in a right-angled triangle 	G6		
		G20		
Section 3: Proving whether a triangle is right-angled	<ul style="list-style-type: none"> To use Pythagoras' theorem to show whether a triangle is right-angled or not 	G6		
		G20		
Section 4: Using Pythagoras' theorem to solve problems	<ul style="list-style-type: none"> To apply Pythagoras' theorem to 2D problems To link Pythagoras' theorem to real-life skills for industry 	G6		
		G20		

Other resources

Problem-solving Book Chapter 3 Q14, Chapter 4 Qs 9, 10, Chapter 5 Q13, Chapter 6 Qs 20, 22, Chapter 7 Q21, Chapter 8 Qs 8, 18, Chapter 9 Qs 19, 20

Homework Book 7 Homeworks mapped to the exercises in the Student Book

<p>GCSE Mathematics Online</p> <ul style="list-style-type: none"> Student Book chapter PDF Lesson notes 9 worksheets (+ solutions) 4 animated widgets 	<ul style="list-style-type: none"> 10 interactive walkthroughs 4 auto-marked quickfire quizzes 4 auto-marked question sets, each with four levels Auto-marked chapter quiz
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Vocabulary hypotenuse, theorem, Pythagorean triple

Suggested teaching time: 6 hours

Required previous learning

- 12 Rounding and estimation
- 26 Ratio
- 35 Pythagoras' theorem

>

36 Trigonometry (Foundation)

>

Prerequisite for chapters

The content in this chapter is not prerequisite knowledge for any other chapters.

Student Book	Learning outcomes	DfE subject content references		
			Standard	Underlined
Section 1: Trigonometry in right-angled triangles	<ul style="list-style-type: none"> • To use the trigonometric ratios given by the sine, cosine and tangent functions to find unknown lengths and angles in 2D right-angled triangles 	R12		
		G20		
Section 2: Exact values of trigonometric ratios	<ul style="list-style-type: none"> • To know the exact ratios given by sine and cosine of 0, 30, 45, 60 and 90 degrees and the exact ratios given by the tangent function for 0, 30, 45 and 60 degrees 	R12		
		G21		
Section 3: Solving problems using trigonometry	<ul style="list-style-type: none"> • To know the difference between an angle of depression and an angle of elevation • To identify when the trigonometric ratios must be used instead of Pythagoras' theorem to solve 2D problems relating to right-angled triangles, including contextual problems 	G20		

Other resources

Problem-solving Book	Chapter 3 Q15, Chapter 10 Q18		
Homework Book	6 Homeworks mapped to the exercises in the Student Book		
GCSE Mathematics Online	<ul style="list-style-type: none"> • Student Book chapter PDF • Lesson notes • 9 worksheets (+ solutions) • 6 animated widgets 	<ul style="list-style-type: none"> • 14 interactive walkthroughs • 5 auto-marked quickfire quizzes • 5 auto-marked question sets, each with four levels • Auto-marked chapter quiz 	

Vocabulary angle of elevation, angle of depression

Suggested teaching time: 4 hours

Required previous learning

14 Powers and roots

28 Graphs of linear functions

>

37 Graphs of other functions and equations (Foundation)

>

Prerequisite for chapters

The content in this chapter is not prerequisite knowledge for any other chapters.

Student Book	Learning outcomes	DfE subject content references	
		Standard	Underlined
Section 1: Review of linear graphs	<ul style="list-style-type: none"> To work fluently with equations of straight-line graphs 	A8	
		A9	
		A10	
Section 2: Quadratic functions	<ul style="list-style-type: none"> To identify and plot graphs of quadratic functions i.e. parabolas To find roots of quadratic equations from the x-intercept of the parabola of the quadratic equation that defines the graph To know the features of graphs of quadratic equations To sketch parabolas 	A12	
		A14	
Section 3: Other polynomials and reciprocals	<ul style="list-style-type: none"> To work fluently with cubic polynomials and their graphs To sketch cubic graphs To work fluently to calculate reciprocals of numbers and plot functions involving reciprocals To identify hyperbolas and match them to their equations 	A12	
		A14	
Section 4: Plotting, sketching and recognising graphs	<ul style="list-style-type: none"> To plot and sketch graphs from given functions To recognise linear, quadratic and reciprocal graphs 	A12	
		A14	

37 Graphs of other functions and equations (continued)

Other resources

Problem-solving Book

Chapter 3 Q16

Homework Book

8 Homeworks mapped to the exercises in the Student Book

GCSE Mathematics Online

- Student Book chapter PDF
- Lesson notes
- 10 worksheets (+ solutions)
- 4 animated widgets
- 13 interactive walkthroughs
- 4 auto-marked quickfire quizzes
- 4 auto-marked question sets, each with four levels
- Auto-marked chapter quiz

Vocabulary quadratic, parabola, polynomial, reciprocal

Suggested teaching time: 6 hours

Required previous learning

13 Percentages

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**38 Growth and decay
(Foundation)**

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Prerequisite for chapters

The content in this chapter is not prerequisite knowledge for any other chapters.

Student Book	Learning outcomes	DfE subject content references	
		Standard	Underlined
Section 1: Simple and compound growth	<ul style="list-style-type: none"> To calculate with simple growth, such as simple interest rates To calculate with compound growth, such as compound interest rates To solve word problems using simple and/or compound growth 	R16	
Section 2: Simple and compound decay	<ul style="list-style-type: none"> To calculate with simple decay To calculate with compound decay, such as depreciation To solve word problems using simple and/or compound decay 	R16	

Other resources

Problem-solving Book	N/A
Homework Book	3 Homeworks mapped to the exercises in the Student Book
GCSE Mathematics Online	<ul style="list-style-type: none"> Student Book chapter PDF Lesson notes 4 worksheets (+ solutions) 1 animated widget 11 interactive walkthroughs 3 auto-marked quickfire quizzes 3 auto-marked question sets, each with four levels Auto-marked chapter quiz

Vocabulary depreciation