Sparx Maths Curriculum Statement

Why did we develop a Sparx Maths Curriculum?

A bit about Sparx Maths…

- Over the last 10 years, the Sparx Maths content design team have been creating and refining a high-quality bank of nearly 50,000 questions.
- Contributions from a team of teachers, mathematicians, scientists, data analysts and linguists have led to a comprehensive and sophisticated content library for secondary maths.
- The data we have collected from over 1 billion question attempts helps us to continually refine our offering. At Sparx, we understand that high-quality content is crucial for learning and that the design process cannot and should not be rushed.
- Teachers and students are at the heart of the content creation process; the attention to detail on every question helps all teachers to understand and support their students in every aspect of maths.

Because of our wealth of experience, our quality-assured content and our access to significant data, we believe it is the right time to support teachers to an even greater extent within the classroom and to help their students become the very best mathematicians that they can be.

Contents

What are the key principles of the Sparx Maths Curriculum?

When designing the Sparx Maths Curriculum and supporting resources, our main aim was to ensure that we deliver a coherent teacher and student experience.

The Sparx Maths Curriculum is sequenced to build on prior learning, enables a deep understanding of the concepts taught and supports the delivery of high-quality teaching and learning. The supporting resources have been designed to compliment each other and link to the curriculum, providing teachers and students with a coherent journey through secondary maths.

Here are the eight principles of the Sparx Maths Curriculum:

Encourages depth of knowledge

By designing the curriculum as a 5-year programme, we have ensured that suitable time is given to cover concepts in depth, providing students with a strong foundation to build upon each year.

Provides full curriculum coverage

We have ensured that the Sparx Maths Curriculum provides full coverage of the KS3 national curriculum and the GCSE mathematics specification, catering for all major exam boards in England.

Empowers all teachers

The curriculum is supported by a suite of resources that supports teacher planning and delivery but, most importantly, gives teachers ownership over their lesson plans. Every context is different so we want to ensure that teachers have the flexibility to create the lessons that work best for them and their students.

Provides impactful assessment

The Sparx Maths Curriculum is supported by formative baseline and termly assessments, complete with mark schemes, which provides teachers with crucial insights on student progress to help inform their planning.

Develops fluency and problem solving

We acknowledge that fluency is essential for giving students the secure toolkit they need to deepen their understanding. Equally, we have ensured that problem solving is a prominent feature throughout. This balance ensures that students build the confidence they need to be successful in maths.

Provides retrieval practice

Through intelligently designed resources, we regularly interleave prior knowledge to give opportunities for retrieval practice. Cross-topic content and, at times, stepping back before moving forward, allows students to consolidate the knowledge they need to take them confidently through the curriculum. Constant revision of concepts through this well-structured retrieval practice ensures that the content can be taught in depth, and in a timely manner.

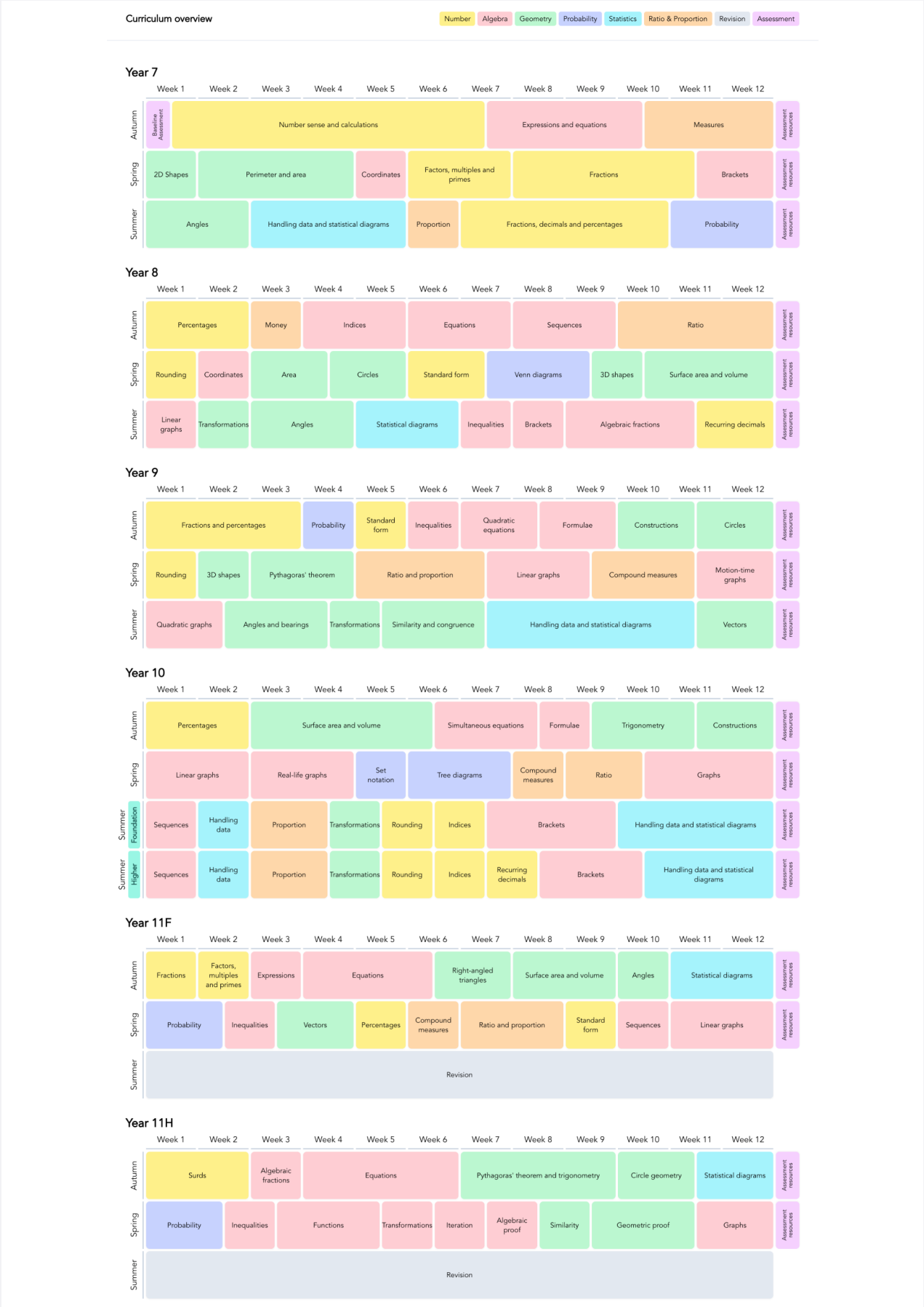
Supports all learners

We have structured the curriculum with flexibility in mind to ensure that all students can be supported. Suggested building blocks are provided to support this journey, and the language we have used throughout is student-friendly. Tiering decisions are not required until late into Year 10. This gives students and teachers the time they need to make this, sometimes complex, decision.

Challenges all learners

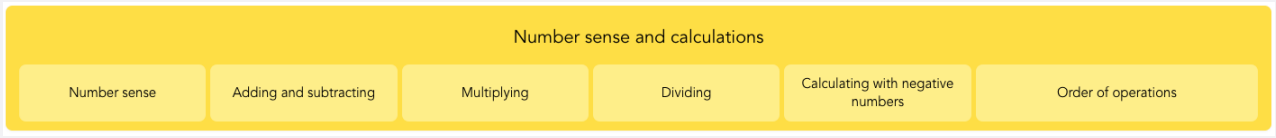
For each unit of work, we have provided opportunities to deepen knowledge as we believe that deepening knowledge and understanding of each topic before moving on aids long term learning. Where suitable, we have also suggested areas for further teaching.

How has the curriculum been structured?



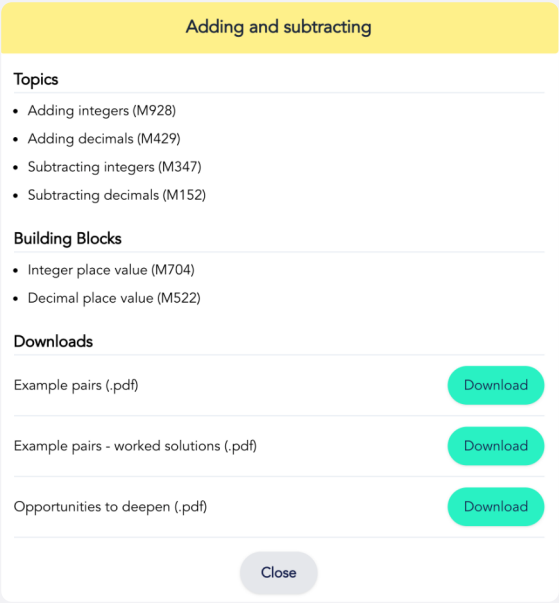
The curriculum is presented on a termly timescale to allow flexibility. The timings given within a term are a guide, enabling teachers to adapt the curriculum to fit their context and classes. Each term is 12 weeks in length, ensuring there is a buffer for revision and assessment, and for any additional teaching time that may be needed.

Each term consists of blocks of related units, for example, the block on *"Number sense and calculations"* is made up of 6 related units.



Each unit is supported by:

- suggested teaching topics, with topic codes for Sparx Maths users.
- building blocks to highlight links to prior learning.
- example pairs of questions that support teachers in modelling key learning points and allow students to practice these new concepts. We have also included versions with modelled solutions.
- examples of opportunities to deepen knowledge.



Tier of entry:

We have given students and teachers the time they need to make tier of entry decisions by keeping the Foundation and Higher tiers aligned until late into Year 10. Until this point, we have not included any 'higher only' content but have instead ensured that learners are securing the depth of knowledge they need to move into the final phase of the GCSE, no matter which tier of entry they follow.

How has the curriculum been sequenced?

The carefully considered sequencing of content ensures that students have gained the fluency required to access upcoming units of work. Subsequent units provide ample opportunity for frequent retrieval of prior knowledge by incorporating cross-topic content.

We have also considered how areas of maths progress through the years, ensuring previous work is continually built upon and concepts are developed. Building blocks are signposted throughout so that prior learning can be revisited if required, to allow all students to move forwards with confidence.

Here are some examples of sequencing decisions:

Year 7: Securing fluency in number sense and calculations

The first six units of Year 7 cover key number content. These topics are essential prerequisite knowledge to enable students to access future topics. Whilst we acknowledge that many students may have an understanding of this content from KS2, it is important to establish that this knowledge is secure. We have provided examples of ways in which students' knowledge can be deepened further to ensure that even the highest-attaining students are stretched.

Which digits replace A, B and C in the boxes?

$$\begin{array}{r} {}^{3}\cancel{4}^{1}\boxed{C}.78 \\ -\ 16.\boxed{B}6 \\ \hline 25.4\boxed{A} \end{array}$$

What number should go in the box below?

$$2^{\square} = 64$$

What is the largest number that can be made by multiplying together two different two-digit integers?

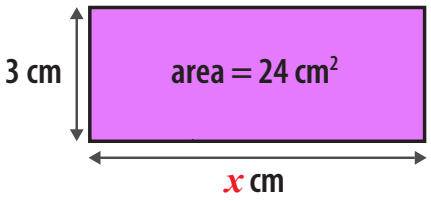
Year 7: Interleaving algebra

In the Autumn term, students will be introduced to manipulating algebraic expressions and solving equations. This content is then interleaved into future topics to ensure these concepts are continually revisited. For example, questions on area, perimeter and averages can involve algebraic expressions and simple linear equations.

The mean of the number cards below is 10. What is the value of d?

$3d$ d $3d-2$ $2d-1$ $d+3$

The area and width of the rectangle below are given. What is the value of x?



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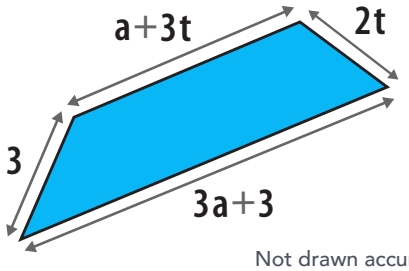
Write an expression for the perimeter of this shape. Simplify your answer fully.



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Year 7: Interleaving negative numbers

Early in Year 7, ordering and calculating with negative numbers are covered in depth. These concepts are then regularly revisited in future topics, providing opportunities for students to continually revise and practise working with negative numbers.

What is the range of the numbers below?

8.1 0.9 -8.4 -8.1 5.2 -4.7

What is $-3 \times \frac{4}{15}$

Expand $-2(7r - 8)$

Year 7: Factors and multiples as prerequisites

In the Spring term, factors and multiples are taught immediately before fraction manipulation and calculations. This ensures that students have the skills to find lowest common multiples and highest common factors, enabling them to access simplifying fractions and finding the lowest common denominator.

Kate is trying to write $\frac{36}{54}$ in its simplest form.

What is the largest number she could divide both the numerator and the denominator by?

a) Find the **lowest common multiple** (LCM) of 6 and 16

b) Hence, write down the **lowest common denominator** of $\frac{1}{6}$ and $\frac{7}{16}$

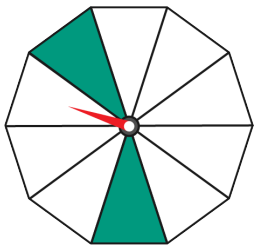
Year 7: Applying fractions, decimals and percentages to probability

In the Summer term, fractions, decimals and percentages are taught immediately before probability. This ensures students are given the opportunity to apply their FDP knowledge to constructing, manipulating and ordering probabilities.

The fair spinner below is split into 10 equal sections.

When the spinner is spun, what is the probability of it landing on a **shaded** section?

Give your answer as a decimal.



A spinner has four sections labelled A,B,C and D. The probability of it landing on sections A, B and C are shown in the table below.

What is the probability, as a percentage (%), of the spinner landing on section D?

Section	Probability
A	$\frac{1}{20}$
B	0.23
C	37%
D	?

The probabilities that Emma will win three different games are given below.

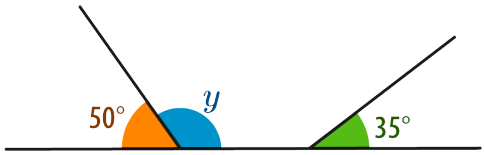
$$0.65, \quad 57\%, \quad \frac{6}{10}$$

Order the probabilities of winning from least likely to most likely.

Progression of finding unknown angles through the year groups

In **Year 7**, students use written calculations and algebraic manipulation to cement and develop their KS2 angles knowledge.

What is the size of angle y?



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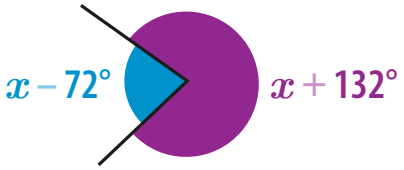
Calculate the size of the **reflex** angle below.



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In **Year 8**, students use prerequisite knowledge to find unknown angles on parallel lines and in polygons.

A parallelogram is shown below.

Work out the size of the angle marked a.

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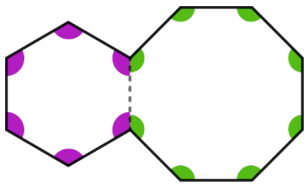
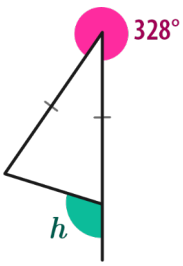
Work out the total of the angles marked in the shape below.



In **Year 9**, students focus on solving problems where a range of angle facts must be used. They are also introduced to bearings, allowing further application of prior angles knowledge.

Find the size of angle h.



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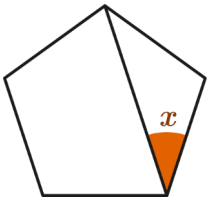
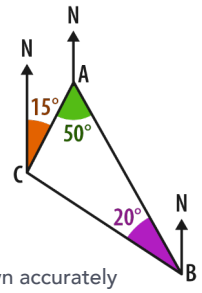
The shape shown is a regular pentagon. Find the size of angle x.



Work out the bearing of C from B.



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Progression of equations and inequalities through the year groups

In **Year 7**, students first encounter algebra by manipulating expressions, culminating in solving simple one-step and two-step linear equations.

Choose the correct symbol to fill in the box below.

4 d means 4 □ d

× + − = ÷

When $d = 3$, work out the value of

a) $4d$

b) $4d + 8$

Solve $4d = 12$

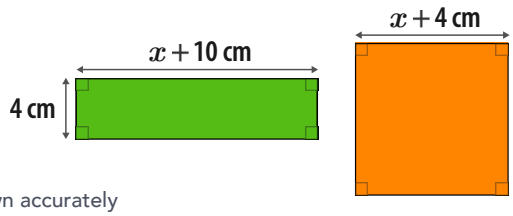
Solve $4d + 8 = 20$

In **Year 8**, students solve equations with the unknown on both sides, solve equations with the unknown in the denominator of a fraction, and construct equations to represent contexts.

Solve $3a + 4 = 39 - 2a$

Solve $\frac{72}{4x} + 11 = 14$

The rectangle and the square below both have the same perimeter. What is the value of x?



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Later in Year 8, students are introduced to simple linear inequalities.
In **Year 9**, this develops into constructing and solving single linear inequalities, including with the unknown on both sides, and solving double inequalities.

Solve $\frac{f}{4} < 8$

Solve $5w - 4 > 59 - 2w$

Find the integer values that satisfy the following inequality

$3 < 2x + 1 \leq 9$

In **Year 10**, students are able to apply their fluency in solving linear equations to solve linear simultaneous equations.

Solve the simultaneous equations below.

$7x - 6y = 30$

$2x + 6y = 24$

Two numbers have a sum of 13 and a difference of 5

What are these two numbers?

What supporting resources are available?

The Sparx Maths Curriculum and supporting resources are available free of charge regardless of whether you are a Sparx Maths user, but a Sparx Maths subscription will allow you to supercharge your use of the curriculum and resources.

Assessment:

Baseline assessment

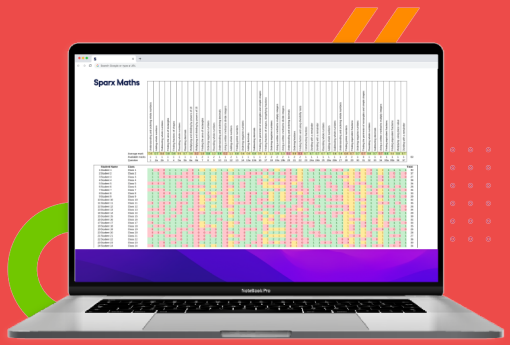
A Year 7 formative baseline assessment package will help you to understand what your new students know and do not know. This assessment is supported by a QLA and weekly fluency tests, giving teachers the tools to close any gaps in student knowledge.

Termly assessments

Termly assessments and mark schemes, designed using years' worth of data, will help you keep track of your students' progress.

Supercharged

For Sparx Maths users, there is access to a digital QLA feature that will give national comparisons and bespoke follow-up work for students and teachers.



Revision:

Termly revision workbooks

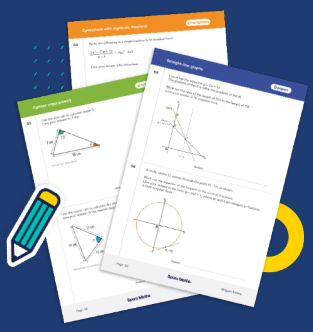
Carefully designed student workbooks support termly assessments, helping students to consolidate learning and identify gaps in their knowledge. They are great for pre-assessment revision, and to support parent/guardian engagement.

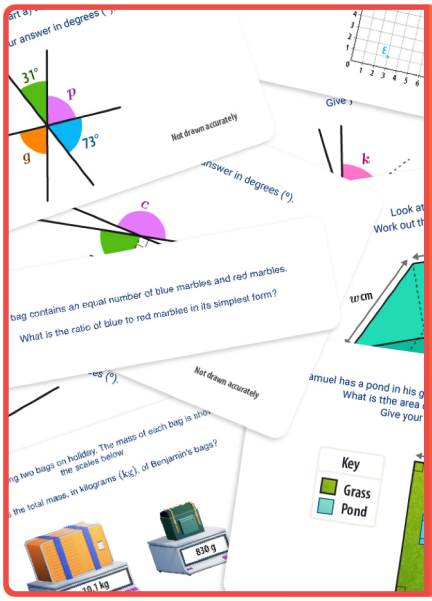
Crossover workbooks

A series of workbooks containing questions from key crossover topics that appear in both the GCSE Foundation and Higher tier papers. There is one workbook for each of the 6 strands of the GCSE curriculum.

Transition resources

Transition workbooks support two critical times in the school calendar, moving from Year 6 to Year 7 and GCSE to A-level. Selected questions give students an opportunity to practise their fluency skills before attempting challenging, problem-solving questions to prepare them for the next stage of their learning.





Supercharged

For Sparx Maths users:

- Each of these booklets contains Sparx Maths topic codes to allow students to access thousands of additional questions and videos in Independent Learning.
- Our homework platform gives students personalised weekly retrieval practice, directly related to our curriculum.

Teaching support:

Example pairs

Example pairs covering key learning points are provided for each topic, giving a detailed, yet manageable, outline of the topic sequence to support teacher planning. Versions with worked solutions are also included.

Opportunities to deepen knowledge

To further help with planning, additional questions for each topic are provided as inspiration for opportunities to deepen student knowledge. Whilst the focus is on depth rather than acceleration, when suitable, we have signposted opportunities for further teaching.

Supercharged

For Sparx Maths users, there is access to thousands of additional questions and videos targeted at a vast range of attainments levels which can be used to support with lesson planning.