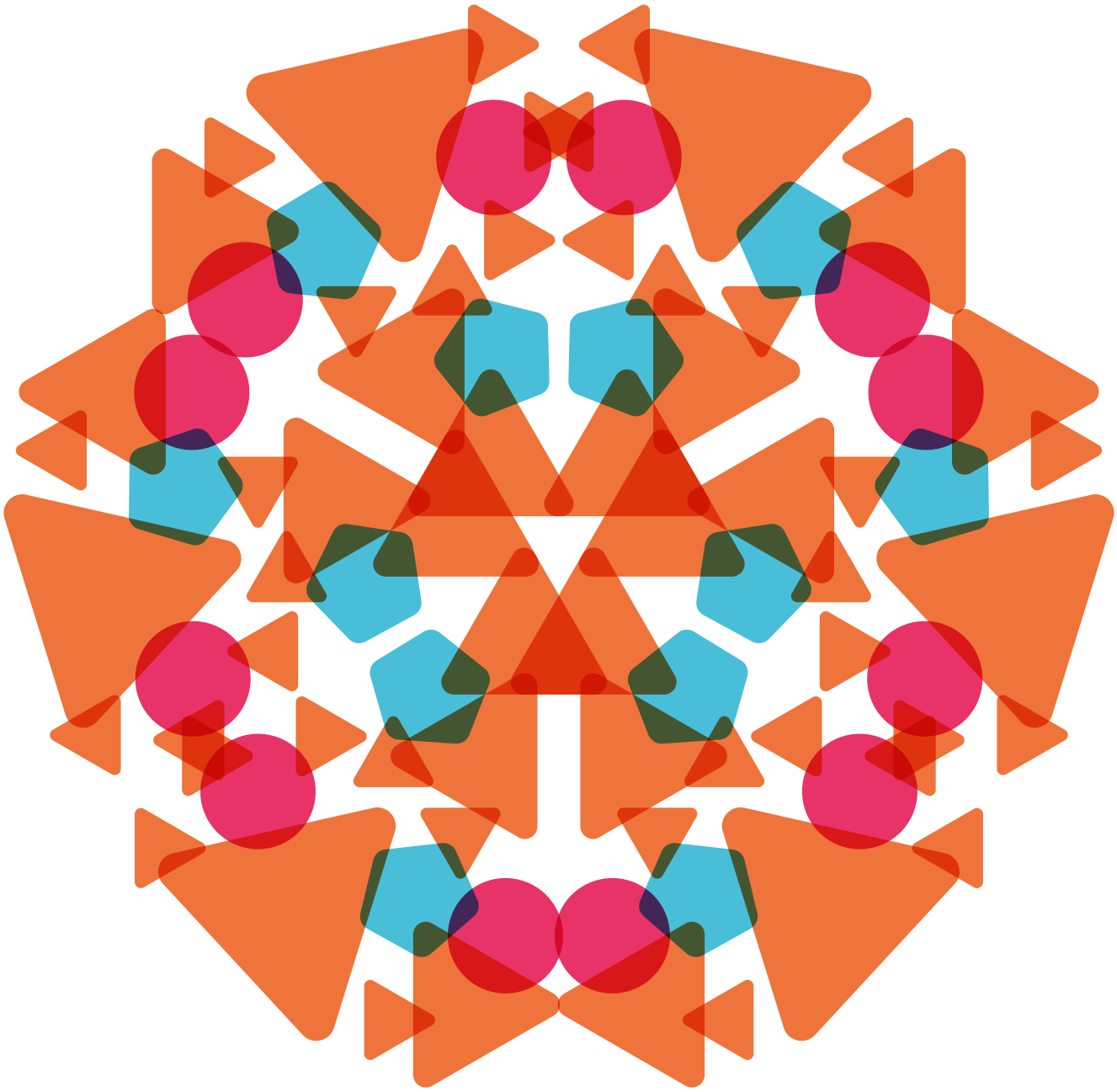
Oxford
International
Curriculum

Primary & Lower Secondary

Maths



OXFORD

I see problem-solvers who can clearly communicate their mathematical thinking

The joy of learning

Oxford University Press is a department of the university, publishing to further the university's objectives of excellence in scholarship, research, and education.

Nurturing creativity, inspiring curiosity, shaping the future

At Oxford University Press, we are committed to enriching the lives of learners across the world through education by developing the highest quality academic and educational resources and services. That's why we invest 100% of the money we make back into education and research.

As part of the University of Oxford, we combine a deep knowledge and understanding of pedagogy to provide quality resources that impact positively on learning. We are trusted by leaders and practitioners to raise levels of attainment all over the world – this is our passion and motivation.

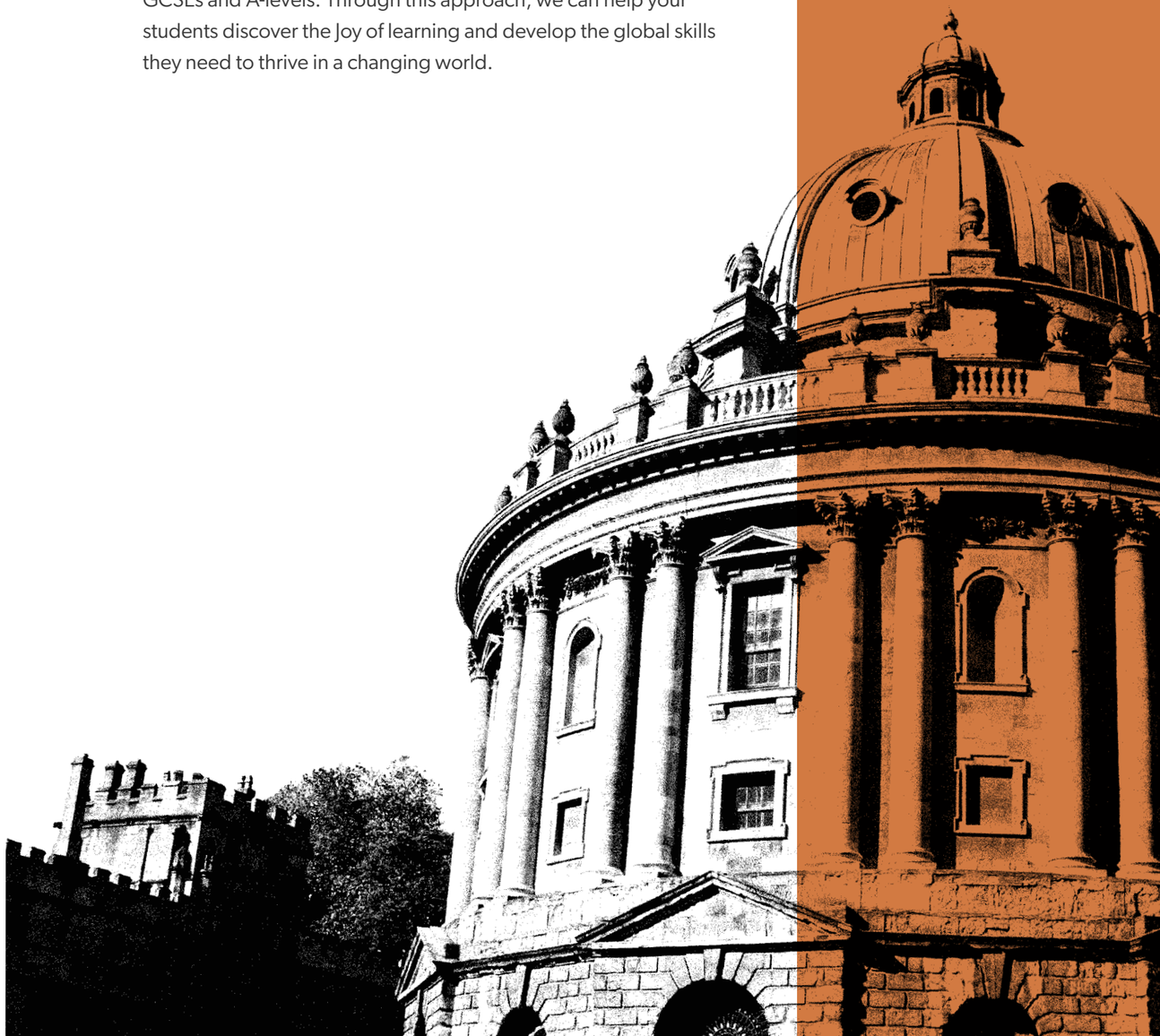
At Oxford University Press, we recognize that we are living in an ever-changing world, where the way we work, live, learn, communicate and relate to one another is constantly shifting. In this climate, we need to instil in our learners the skills to equip them for every eventuality so they are able to overcome challenges, adapt to change and have the best chance of success. To do this, we need to evolve beyond traditional teaching approaches and foster an environment where students can start to build lifelong learning skills for success. Students need to learn how to learn, how to problem solve, be agile and work flexibly. Going hand in hand with this is the development of self-awareness and mindfulness through the promotion of wellbeing to ensure students learn the socio-emotional skills to succeed.

What's more, a focus on cultivating a growth mindset, where students learn to thrive on challenge and see failure as a way to stretch themselves, will act as a foundation to improve their performance.

That's why we have developed the Oxford International Curriculum. The curriculum offers a new approach to teaching and learning focused on wellbeing, which places joy at the heart of the curriculum and develops the global skills your learners need for their future academic, personal and career success.

Through six subjects – English, Maths, Science, Computing, Wellbeing and Global Skills Projects – the Oxford International Curriculum offers your school a coherent and holistic approach to ensure continuity and progression across every student's educational journey, equipping them with the skills to shape their own future and progress seamlessly to studying for International GCSEs and A-levels. Through this approach, we can help your students discover the Joy of learning and develop the global skills they need to thrive in a changing world.

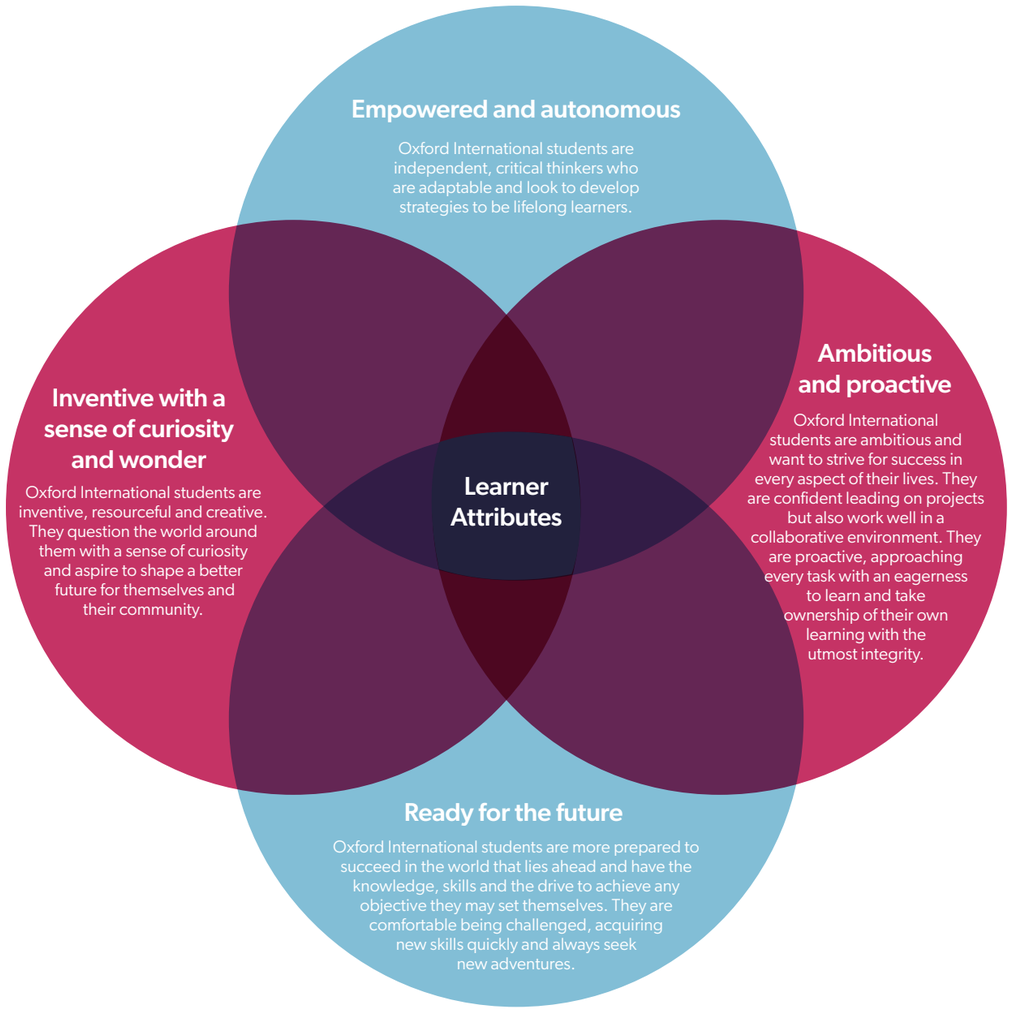
> **"Thinking together so we can act together to make the futures we want.**
>
> UNESCO Futures of Education initiative



Challenge seekers, problem solvers, next leaders

The Oxford International Curriculum aims to deliver the wellbeing and global skills that will be needed in future, to the learners of today, providing them with a firm foundation for future employment and participation in society.

The Oxford International Curriculum helps to develop:



A classroom culture that fosters lifelong learning and wellbeing

The Oxford International Curriculum enables students to succeed by recognizing that lasting success is contingent on both academic performance and emotional wellbeing. The curriculum aims to foster a classroom environment where students develop the skills for success:

Creativity and critical thinking	Real-world skills	Communication and collaboration	Self-development skills
problem solving, curiosity and wonder, critical thinking	project management, functional literacy, research	communication, leadership, relationship building	risk taking, ethics, motivation

The Oxford International Curriculum also promotes teachers' and learners' resilience, agency and self-regulation to cope in the world of tomorrow. This focus on wellbeing aims to promote good mental health to enhance students' lives inside and outside of the classroom. Key themes of wellbeing include:

Taking care of the body	Taking care of the mind	Taking care of relationships	Taking care of self and the world
learning how to keep active and eating healthily can directly impact on positive mental health	promoting mindfulness to train learners to be more optimistic and manage stress	how to build and maintain friendships and relationships with family, how to communicate with others more effectively and how to connect through acts of kindness	encouraging students to have a focus and find purpose in the world around them, helping them to aspire to be better citizens

The Oxford International Curriculum offers a practical, robust and effective continuous professional development programme specifically designed for international schools to support the implementation of its pedagogy.

By promoting wellbeing and developing global life-skills, the Oxford International Curriculum will prepare your students for success in an ever changing world, giving them the springboard to achieve academically and nurturing them to shape a better future.

Contents

Our curriculum developers:

Keith Gallick

A Maths educator with an engineering background, Keith has worked in digital educational publishing since 2005, authoring for over 20 textbooks, and working as a subject expert on maths schemes including MyMaths.

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A University of Oxford alumni with breadth and depth of experience in educational publishing, Olivia has been directly involved in the creation of various maths schemes, notably MathsBeat, MyMaths, Maths Makes Sense, Numicon and Inspire Maths.

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Preface

The Oxford International Curriculum for Maths is based on six core strands of learning, which are inherently inter-connected and overlapping. The result is a spiral curriculum, with mastery at its core, building in complexity each year. The six strands are: Number; Calculating; Measure, ratio and proportion; Geometry; Algebra; and Statistical thinking.

Of key importance to pupils' success with mathematics is their ability to communicate their thinking clearly. Therefore, through the teaching of the Oxford International Curriculum for Maths, pupils are given sufficient language support with new vocabulary, and new learning is introduced through a variety of concrete and pictorial representations with as many links to real life contexts as possible, to allow pupils to build a strong mental schema.

The key features of Oxford International Curriculum for Maths are that it is:

- **Relevant:** A problem-solving approach is embedded into the framework of skills and understanding, and students are encouraged to use their mathematical skills in a real-world context.
- **Realistic and deliverable:** Learning outcomes can be achieved with the resources that exist right now in schools throughout the world.
- **Flexible:** The curriculum is designed to be adaptable so that schools can tailor it to their specific needs.
- **Transparent:** A key feature of this curriculum is clear communication: all teachers, working with any age group, will understand what they need to teach and what students need to learn.
- **Measurable:** The curriculum is linked to an assessment framework that will enable teachers to evaluate, measure and record individual students' progress.

Our approach to Maths

This curriculum is structured as a simple matrix with an associated assessment framework and supporting schemes of work and lesson plans.

The curriculum matrix has learning outcomes for every year from Year 1 (ages 5–6 years) to Year 9 (ages 13–14 years). The learning outcomes are organized into six themes:

- Number
- Calculating
- Measure, ratio and proportion
- Geometry
- Algebra
- Statistical thinking

The assessment framework provides measurable and unambiguous criteria against each learning outcome. These criteria describe how teachers can confirm that learners have achieved the outcomes set out in the curriculum.

Curriculum at a glance (page 12)

The six strands

The six strands encompass the full spectrum of skills and understanding that students need to develop at primary and lower secondary level, to both prepare them for further mathematical study, and in their everyday lives.

1

Number:
Pupils' understanding of number is the foundation of their maths learning: it is crucial that they are able to read, order and position numbers. The key role of place value in all the other strands allows plenty of opportunity build deeper understanding and catch any misconceptions. Alongside understanding whole numbers, pupils build an understanding of parts of whole numbers, or fractions.

2

Calculating:
The four operations are introduced to pupils in this curriculum using objects and amounts. Pupils use apparatus, known facts, drawings and informal written methods in their calculating to develop a deep understanding of each of the operations and to become fluent with calculating mentally.

3

Measure, ratio and proportion:
The emphasis within this strand is on the need to answer real-life questions. As pupils' understanding of number, calculating and shape progresses so do the complexities of the measure questions, building towards using algebraic formulas to calculate measures, such as surface area and volume, and making comparisons in terms of ratio and proportion.

4

Geometry:
Understanding shape requires pupils to notice parts of shapes or recurring themes that allow us to sort and group shapes and to give them names. Initially pupils learn about position, direction and movement in space with their own bodies and with real objects. Next, they use labelled grids to communicate about position, movement and direction, progressing towards representing shapes and transformations on cartesian coordinate grids.

5

Algebra:
Pupils begin their pattern spotting work in their early years, which is a strong foundation for learning to express mathematical relationships algebraically.

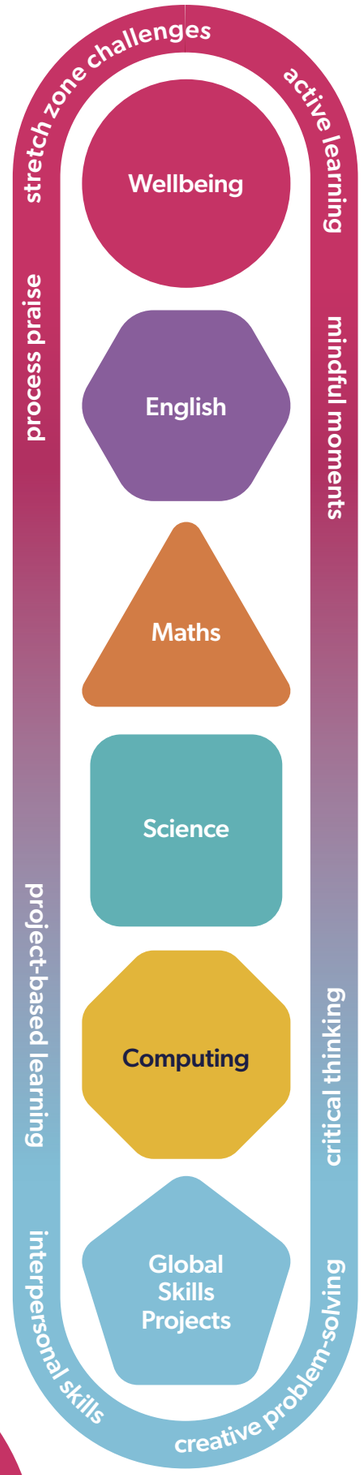
6

Statistical thinking:
Statistics work in this curriculum is driven by questions. In the early stages, pupils are encouraged to sort objects by categories, progressing to collecting their own data and setting their own questions to find the answers to, and working with increasingly complex data sets.

How the curriculum works

Six subjects, one approach

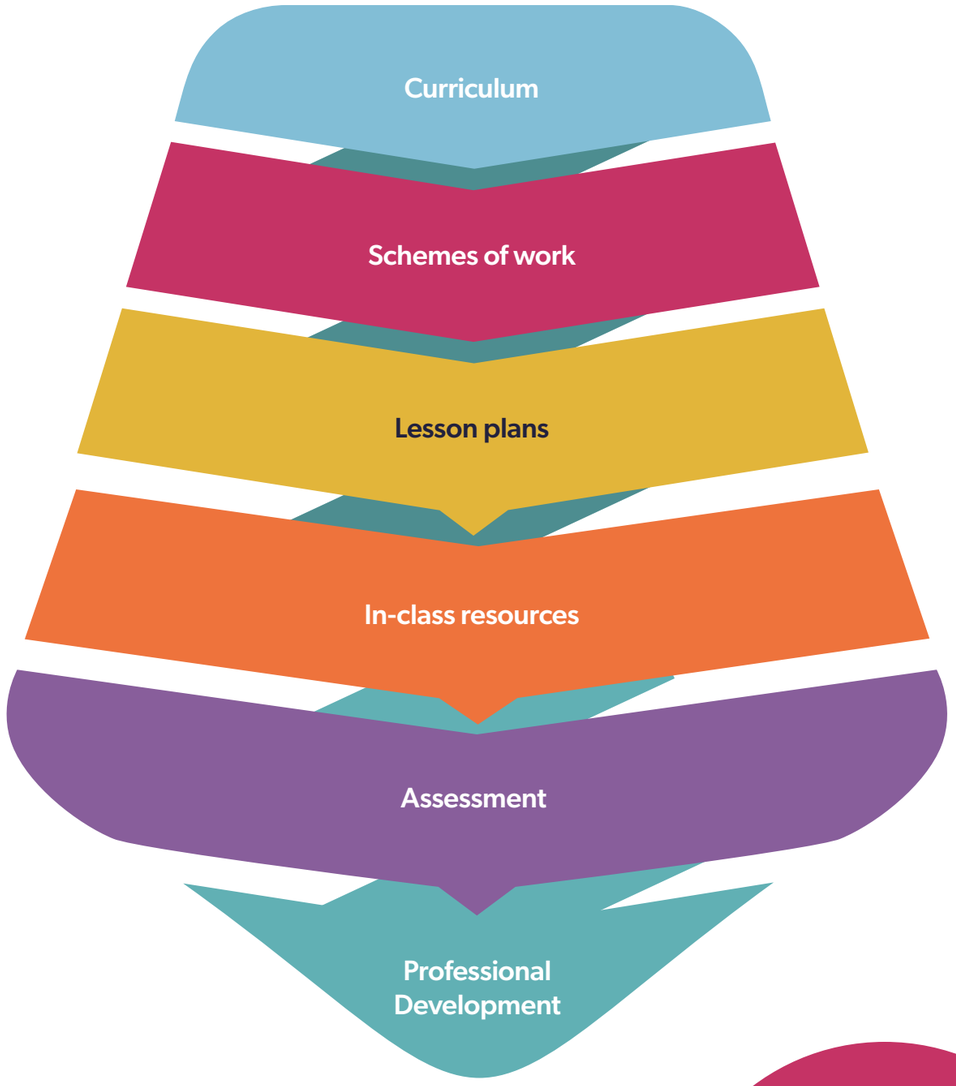
The Oxford International Curriculum spans six subjects, which all have the same approach to the 'Joy of learning'. Wellbeing and Global Skills Projects are at the heart of the four core subjects of English, Maths, Science and Computing, and the development of the Oxford International Curriculum for Maths has been guided by the wellbeing and global skills philosophy. Lesson plans highlight points at which the Global Skills Projects and Wellbeing curricula can be integrated into the teaching of core subjects. The curriculum takes a spiral approach, revisiting key topics to consolidate and support progression in learning.



Building the curriculum

The Oxford International Curriculum for Maths offers end-to-end teaching and learning support, and is composed of:

- Curriculum at a glance: a year-on-year progression of learning outcomes for every year group
- Schemes of work: overview and detailed schemes of work provide timetabling options by year group, and week-by-week teaching suggestions
- Lesson plans: provide a blueprint for each lesson, ensuring coverage of specific learning outcomes; the plans link to recommended resources and worksheets where relevant
- Assessment framework: assessment criteria linked to every learning outcome in the curriculum.



Curriculum at a glance

Strand	Year 1	Year 2	Year 3	Year 4
	Students can:	Students can:	Students can:	Students can:
1 Number ■ **Number and place value** ■ **Fractions, decimals and percentage thinking**	**1.1a:** Count to 50, forwards and backwards **1.1b:** Count in multiples of 2, 5, 10 and other small multiples **1.1c:** Read and write numbers to 50 in numerals and to 20 in words **1.1d:** Compare numbers and quantities to 50, including the use of pictorial representations **1.1e:** Identify one greater/fewer than any number of objects to 50 **1.1f:** Find one more or less than a given number **1.1g:** Order numbers to 50 **1.1h:** Use the early ordinal numbers **1.1i:** Use the language of simple fractions **1.1j:** Understand the relationship between whole numbers and parts of numbers **1.1k:** Know and apply the fact that half is one of two equal parts and one quarter is one of four equal parts	**2.1a:** Count to 100, forwards and backwards **2.1b:** Count in multiples of 2, 3 and 5 from 0 **2.1c:** Count forwards and backwards in tens from any number **2.1d:** Read and write numbers to 100 in numerals and words **2.1e:** Compare and order numbers and quantities to 100, including the use of <, >, = symbols **2.1f:** Find 10 more or less than a given number **2.1g:** Give a numerical estimate of a quantity **2.1h:** Partition numbers into tens and ones **2.1i:** Use place value apparatus and part-whole reasoning to solve problems **2.1j:** Round to the next multiple of ten **2.1k:** Count on from any number in halves and quarters to 10 **2.1l:** Write simple fractions using fraction notation **2.1m:** Recognize the simple non-unit fractions $\frac{1}{2}$ as 2 out of 4, $\frac{1}{4}$ as 3 out of 4 **2.1n:** Recognize and use the facts that one half is equal to two quarters and that one third is one of three equal parts	**3.1a:** Count in multiples of 4, 8, 50 and 100 from 0 **3.1b** Read and write numbers to 1000 in numerals and words **3.1c:** Compare and order numbers up to 1000 **3.1d:** Determine the value of each digit in a 3-digit number **3.1e:** Find 100 more or less than a given number **3.1f:** Represent and estimate numbers using different representations **3.1g:** Partition numbers into hundreds, tens and ones **3.1h:** Solve problems involving number to 1000 **3.1i:** Count forwards and backwards in tenths **3.1j:** Relate tenths to decimal measures and division by ten **3.1k:** Compare and order fractions with the same denominator **3.1l:** Recognize and show, using diagrams, equivalent fractions with small denominators **3.1m:** Solve simple problems using fractions	**4.1a:** Count in multiples of 6, 7, 9, 10, 25, 100 and 1000 from 0 **4.1b:** Count backwards through zero to include negative numbers **4.1c:** Compare and order numbers to 10000 **4.1d:** Determine the value of each digit in a 4-digit number **4.1e:** Find 1000 more or less than a given number **4.1f:** Round any number to the nearest 10, 100 or 1000 **4.1g:** Partition numbers into thousands, hundreds, tens and ones **4.1h:** Solve problems involving number to 10 000 **4.1i:** Read Roman numerals to 100 **4.1j:** Count forwards and backwards in hundredths **4.1k:** Relate hundredths to division by 100 **4.1l:** Use diagrams, including fraction walls, to represent families of common equivalent fractions **4.1m:** Recognize and write decimal equivalents for any number of tenths or hundredths and for $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ **4.1n:** Understand the effect of dividing a 1-digit or 2-digit number by 10 or 100 **4.1o:** Compare numbers with the same number of decimal places, up to two decimal places **4.1p:** Round decimals with one decimal place to the nearest whole number **4.1q:** Solve simple problems involving fractions and decimals to two decimal places

Year 5	Year 6	Year 7	Year 8	Year 9
Students can:	Students can:	Students can:	Students can:	Students can:
5.1a: Read and write numbers to 1 000 000 in numerals and words **5.1b:** Count forwards and backwards to 1 000 000 in steps 10, 100, 1000, 10 000 and 100 000 **5.1c:** Compare and order numbers to 1 000 000 **5.1d:** Determine the value of each digit in a 5-digit or 6-digit number **5.1e:** Round any number to 1 0 000 00 to the nearest 10, 100, 1000, 10 000 and 100 000 **5.1f:** Solve problems involving numbers to 1 000 000 **5.1g:** Recognize the concept of negative numbers and represent them on a number line **5.1h:** Read Roman numerals to 1000 and recognize years written in Roman numerals **5.1i:** Compare and order fractions whose denominators are all multiples of the same number **5.1j:** Identify, name and write equivalent fractions represented visually **5.1k:** Write mixed numbers as improper fractions and convert from one form to the other **5.1l:** Read and write decimal numbers as fractions **5.1m:** Relate thousandths to tenths, hundredths and decimal equivalents **5.1n:** Recognize the percent symbol (%) and understand that percent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal **5.1o:** Round decimals with two decimal places to the nearest whole number and to one decimal place **5.1p:** Read, write, order and compare numbers with up to three decimal places **5.1q:** Solve problems involving number up to three decimal places **5.1r:** Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25	**6.1a:** Read and write numbers to at least 10 000 000 in numerals and words **6.1b:** Determine the value of each digit in a 7-digit or 8-digit number **6.1c:** Round any whole number to a required degree of accuracy **6.1d:** Calculate across 0 and use negative numbers in context **6.1e:** Solve problems involving number to 10 000 000 **6.1f:** Identify the values of all the digits in a number given to three decimal places **6.1g:** Understand that percentages, decimals and fractions are different ways of expressing proportions of a whole, and know the common equivalences	**7.1a:** Compare and order positive and negative numbers **7.1b:** Recognize and use powers and roots (up to 3) **7.1c:** Determine the value of each digit in any number **7.1d:** Use estimates to check answers **7.1e:** Compare and simplify fractions **7.1f:** Write one number as a fraction of another and find a fraction of an amount **7.1g:** Recognize and use the equivalence of fractions, decimals and percentages **7.1h:** Convert between fractions, decimals and percentages **7.1i:** Compare and order fractions, decimals and percentages **7.1j:** Use mental methods to find a simple percentage of an amount **7.1k:** Round any decimal to one decimal place	**8.1a:** Round any decimal to given number of decimal places **8.1b:** Find the upper and lower bounds of a given quantity **8.1c:** Solve problems involving decimals **8.1d:** Calculate one number as a percentage of another **8.1e:** Calculate percentage increase and decrease **8.1f:** Find a percentage of an amount using a multiplier or by using a unitary method **8.1g:** Perform calculations using simple interest **8.1h:** Solve real-life problems involving fractions, decimals and percentages	**9.1a:** Round an integer to a given number of significant figures **9.1b:** Solve problems involving upper and lower bounds **9.1c:** Write, compare and order numbers using standard form **9.1d:** Calculate with numbers written in standard form **9.1e:** Calculate reverse percentages **9.1f:** Perform calculations using compound interest **9.1g:** Use set notation **9.1h:** Use Venn diagrams to represent sets

Curriculum at a glance

Strand	Year 1	Year 2	Year 3	Year 4
	Students can:	Students can:	Students can:	Students can:
2 Calculating	**1.2a:** Use the language and symbols for addition, subtraction and equality **1.2b:** Recognize the relationship between addition and subtraction **1.2c:** Add and subtract numbers to 20 including 0 **1.2d:** Recognize and use number bonds to 20 **1.2e:** Use part whole reasoning **1.2f:** Solve simple addition and subtraction problems using objects or pictorial representations **1.2g:** Use grouping and sharing as an introduction to multiplication and division **1.2h:** Double and halve simple numbers and quantities **1.2i:** Solve simple multiplication and division problems using objects or pictorial representations	**2.2a:** Recall and use addition and subtraction facts to 20 **2.2b:** Add and subtract 1-digit and 2-digit numbers **2.2c:** Use understanding of number bonds to 10 to derive number bonds to 100 **2.2d:** Use addition and subtraction to solve problems **2.2e:** Use the inverse relationship between addition and subtraction to solve problems and to check working **2.2f:** Understand that addition is commutative, but subtraction is not **2.2g:** Use the language and symbols for multiplication and division **2.2h:** Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables **2.2i:** Use the inverse relationship between multiplication and division to solve problems and to check working **2.2j:** Understand that multiplication is commutative, but division is not **2.1k:** Find and represent $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of an amount	**3.2a:** Use efficient mental and expanded formal written methods for addition and subtraction of numbers of up to three digits **3.2b:** Use addition and subtraction to solve more complex problems **3.2c:** Use the inverse relationship between addition and subtraction to solve more complex problems and to check working **3.2d:** Add and subtract fractions with the same denominator **3.2e:** Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables **3.2f:** Use efficient mental and written methods for multiplication and division of a 1-digit or 2-digit number by a 1-digit number **3.2g:** Recognize and use the patterning in multiplying and dividing by 10 **3.2h:** Solve simple two-step problems in context	**4.2.a:** Use efficient formal written methods to add and subtract numbers with up to four digits **4.2b:** Solve two-step problems in context **4.2.c:** Estimate and use inverse operations to check answers to a calculation **4.2d:** Recall and use multiplication and division facts for the multiplication tables up to 12 x 12 **4.2e:** Use efficient written methods for multiplication and division of a 2-digit or 3-digit number by a 1-digit number **4.2f:** Recognize and use the patterning in multiplying and dividing by 10 **4.2g:** Recognize and use factor pairs and commutativity in mental calculations **4.2h:** Solve two-step problems in context **4.2i:** Estimate and use inverse operations to check answers to a calculation **4.1j:** Continue to use efficient mental methods where appropriate

Year 5	Year 6	Year 7	Year 8	Year 9
Students can:	Students can:	Students can:	Students can:	Students can:
5.2a: Use written methods to add and subtract numbers with up to four digits **5.2b:** Use mental methods to add and subtract increasingly large numbers **5.2c:** Solve multi-step problems in context **5.2d:** Use rounding to check answers and determine levels of accuracy **5.2e:** Add and subtract fractions with the same denominator, and denominators that are multiples of the same number **5.2f:** Use formal written methods for multiplying numbers up to four digits by 1-digit and 2-digit numbers **5.2g:** Use formal written methods for dividing numbers up to four digits by 1-digit numbers **5.2h:** Multiply and divide by 10, 100 and 1000 **5.2i:** Use known facts to multiply and divide numbers **5.2j:** Multiply proper fractions and mixed numbers by whole numbers **5.2k:** Identify primes (to 100), factors and multiples **5.2l:** Find factor pairs and common factors **5.2m:** Use index notation for square numbers and cube numbers **5.2n:** Solve multi-step problems, including those involving the use of factors and multiples, squares and cubes	**6.2a:** Solve multi-step addition and subtraction problems in context, and use estimation to check accuracy **6.2b:** Add and subtract mixed numbers and fractions with different denominators **6.2c:** Use long multiplication to multiply numbers up to four digits by 2-digit numbers **6.2d:** Use long and short division to divide numbers up to four digits by 2-digit numbers, including with remainders (as fractions or as decimals) **6.2e:** Use written methods to multiply 1-digit numbers with two decimal places by a whole number **6.2f:** Use written methods to perform division where the answer has up to two decimal places **6.2g:** Use order of operations to carry out multi-step problems in context and use estimation to check accuracy **6.2h:** Use common factors to simplify fractions **6.2i** Multiply simple fractions **6.2j:** Multiply and divide numbers by 10, 100 and 1000	**7.2a:** Use written and mental methods to add and subtract positive and negative numbers **7.2b:** Add and subtract mixed numbers **7.2c:** Add and subtract decimals **7.2d:** Multiply proper fractions and mixed numbers by positive whole numbers and by fractions **7.2e:** Use division to write a fraction as a decimal **7.2f:** Divide decimals by whole numbers, and solve problems involving decimals **7.2g:** Find lists of factors, multiples, primes and factor pairs, and use them to find the highest common factor and lowest common multiple of a pair of numbers **7.2h:** Multiply and divide positive and negative numbers **7.2i:** Divide integers and fractions by fractions	**8.2a:** Multiply fractions by integers and fractions **8.2b:** Recognize and find the reciprocal of a fraction **8.2c:** Write a recurring decimal as a fraction **8.2d:** Write a fraction as a recurring decimal **8.2e:** Multiply and divide any number by 0.1, 0.01 or 0.001 **8.2f:** Use written methods to multiply and divide decimals	**9.2a:** Use the index laws to simplify numerical expressions and perform calculations **9.2b:** Write the prime factor decomposition of numbers and use the results to find the highest common factor and lowest common multiple of a pair of numbers **9.2c:** Perform calculations involving surds **9.2d:** Simplify expressions involving surds **9.2e:** Rationalize the denominator

Curriculum at a glance

Strand	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
	Students can:	Students can:	Students can:	Students can:	Students can:	Students can:	Students can:	Students can:	Students can:
3 Measure, ratio and proportion	**1.3a:** Compare lengths/heights, masses/weights, capacities/volumes and times **1.3b:** Measure and record lengths/heights, masses/weights, capacities/volumes and times **1.3c:** Solve practical problems involving lengths/heights, masses/weights, capacities/volumes and times **1.3d:** Chronologically order events **1.3e:** Use the language of time **1.3f:** Tell the time to the half hour **1.3g:** Know the days of the week and months of the year **1.3h:** Recognize and know the value of notes and coins	**2.3a:** Use appropriate apparatus to measure length/height, mass/weight, volume/capacity and temperature **2.3b:** Use appropriate standard units of length/height (m/cm), mass/weight (kg/g), volume/capacity (l/ml), and temperature (°C) **2.3c:** Compare and order measurements, including use of <, >, = symbols **2.3d:** Compare and sequence intervals of time **2.3e:** Tell and write the time to five minutes, including quarter past/to the hour, and draw the hands on a clock face to show these times **2.3f:** Know the number of minutes in an hour and the number of hours in a day **2.3g:** Solve simple addition and subtraction problems with money in local currency and show equivalences **2.3h:** Make different amounts of money with coins and notes	**3.3a:** Use appropriate apparatus to measure and compare length/height (m/cm/mm), mass/weight (kg/g) and volume/capacity (l/ml) **3.3b:** Express measurements using appropriate mixed units **3.3c:** Tell and write the time to the nearest minute using anologue clocks (including using Roman numerals) **3.3d:** Convert between 12-hour and 24-hour clock times **3.3e:** Know the number of seconds in a minute and the number of days in each month, year and leap year **3.3f:** Solve simple problems involving time **3.3g:** Calculate how much change must be given in your local currency **3.3h:** Solve simple problems, including scaling **3.3i:** Measure the perimeter of simple 2D shapes	**4.3a:** Estimate, measure and record different measures **4.3b:** Convert between different units of measure of length, mass and capacity **4.3c:** Explore perimeter and area, by counting squares, with rectilinear shapes **4.3d:** Interpret negative numbers in the context of temperature **4.3e:** Read, write and convert between analogue and digital 12-hour and 24-hour clock times **4.3f:** Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days **4.3g:** Solve simple money problems involving fractions and decimals to two decimal places **4.3h:** Solve positive integer scaling problems in a variety of contexts	**5.3a:** Convert between different units of measure of length, mass and capacity **5.3b:** Use equivalences between metric and imperial units **5.3c:** Measure and calculate perimeters of composite rectilinear shapes **5.3d:** Calculate and compare the area of rectangles **5.3e:** Correctly use the units of area **5.3f:** Estimate volume and capacity **5.3g:** Convert between units of time **5.3h:** Recognize that percentages, decimals and fractions are different ways of expressing proportions	**6.3a:** Solve problems that require conversion between different units of measure **6.3b:** Convert between kilometres and miles **6.3c:** Recognize that shapes with the same areas can have different perimeters **6.3d:** Calculate the area of parallelograms and triangles **6.3e:** Calculate volumes of cubes and cuboids using various units **6.3f:** Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples	**7.3a:** Solve problems involving metric conversions **7.3b:** Calculate the perimeter of regular and irregular polygons **7.3c:** Calculate the areas of squares, rectangles, compound shapes made from rectangles **7.3d:** Solve perimeter and area problems **7.3e:** Express two quantities as a ratio and write ratios in their simplest form **7.3f** Recognize the relationship between ratio and proportion **7.3g:** Solve simple proportional reasoning problems	**8.3a:** Calculate the areas of triangles, trapezia and parallelograms **8.3b:** Calculate the area of compound shapes made from rectangles and triangles **8.3c:** Calculate the surface area and volume of cubes and cuboid **8.3d:** Simplify ratios involving decimals **8.3e:** Simplify ratios involving different units **8.3f:** Use ratio to share a quantity into three parts **8.3g:** Solve problems involving ratio **8.3h:** Solve problems involving speed, distance, time	**9.3a:** Calculate the surface area and volume of prisms **9.3b:** Calculate the circumference and area of a circle **9.3c:** Solve problems involving circles and parts of circles **9.3d:** Recognize direct proportion and set up equations that show direct proportion **9.3e:** Recognize and use inverse proportion **9.3f:** Solve problems involving rates of change and compound measures **9.3g:** Find the surface area of some solids **9.3h:** Find the volume of some solids **9.3i:** Find the surface area of some compound solids **9.3j:** Find the volume of some compound solids

Curriculum at a glance

Strand	Year 1	Year 2	Year 3	Year 4
	Students can:	Students can:	Students can:	Students can:
4 Geometry ■ **Shape** ■ **Position, direction & movement**	**1.4a:** Recognize, name and sort common 2D shapes **1.4b:** Recognize, name and sort common 3D shapes **1.4c:** Understand how 2D shapes are connected to 3D shapes **1.4d:** Use positional and directional language to describe objects **1.4e:** Explore and describe half, quarter and three-quarter turns	**2.4a:** Identify and describe simple properties of 2D and 3D shapes, including line symmetry in a vertical line, and compare and sort them **2.4b:** Identify and describe the properties of 3D shapes, including the number of edges, vertices and faces **2.4c:** Give and follow position, direction and movement instructions, including forwards, backwards, clockwise, anti-clockwise and turns in right angles	**3.4a:** Draw simple 2D shapes **3.4b:** Use modelling materials to make 3D shapes **3.4c:** Recognize angles as a description of a turn or a property of a shape **3.4d:** Identify acute and obtuse angles **3.4e:** Identify horizontal and vertical lines, and recognize when lines are parallel or perpendicular **3.4f:** Recognize that a right angle is a quarter turn and that two right angles are a half turn **3.4g** Describe position of 2D shapes on a grid	**4.4a:** Compare and classify geometric shapes based on their properties and sizes **4.4b:** Explore line symmetry in 2D shapes **4.4c:** Draw a pair of axes with equal scales and numbering **4.4d:** Read, write and use coordinates on a grid in the first quadrant to identify a position **4.4e:** Describe movements between positions as translations of a given unit to the left/right and up/down **4.4f:** Plot given points and draw sides to complete a given polygon

Year 5	Year 6	Year 7	Year 8	Year 9
Students can:	Students can:	Students can:	Students can:	Students can:
5.4a: Draw, measure, estimate and compare acute, obtuse and reflex angles **5.4b:** Identify and use sum facts about angles that are multiples of 90°, angles on a straight line and angles at a point **5.4c:** Draw lines to the nearest mm and use conventional markings for perpendicular and parallel lines **5.4d:** Identify 3D shapes from 2D drawings **5.4e:** Use properties of rectangles to deduce related facts about missing lengths and angles **5.4f:** Distinguish between regular and irregular polygons based on reasoning about side length and angle size **5.4g:** Use the language of simple transformations **5.4h:** Identify, describe and represent the position of a shape following a translation or a reflection in a horizontal or vertical line, and know that the shape has not changed	**6.4a:** Use given dimensions and angles to draw 2D shapes **6.4b:** Identify and build simple 3D shapes, including making nets **6.4c:** Classify geometric shapes based on their properties **6.4d:** Find unknown angles in any triangles, quadrilaterals, and regular polygons **6.4e:** Identify vertically opposite angles **6.4f:** Draw and name parts of circles, including radius, diameter and circumference **6.4g:** Know that the diameter of a circle is twice the radius **6.4h:** Use coordinates in all four quadrants **6.4i:** Translate and reflect simple shapes	**7.4a:** Identify and use line and rotational symmetry in triangles and quadrilaterals **7.4b:** Recognize and use properties of triangles **7.4c:** Make accurate drawings, including scale drawings **7.4d:** Solve problems involving angles at a point **7.4e:** Understand the meaning of similarity and congruency, and identify similar and congruent shapes **7.4f:** Use positive and negative coordinates **7.4g:** Find the coordinates of the midpoint of a line segment **7.4h:** Use reflections, rotations, translations and combinations of transformations of 2D shapes **7.4i:** Enlarge 2D shapes by a given scale factor	**8.4a:** Identify and use the properties of quadrilaterals **8.4b:** Identify and use alternate and corresponding angles to solve problems with intersecting and parallel lines **8.4c:** Identify and calculate interior and exterior angles of polygons **8.4d:** Recognize and use the conditions of similarity **8.4e:** Find the bearing of one point from another **8.4f:** Solve simple problems involving bearings **8.4g:** Recognize and use the relationship between lengths in similar figures **8.4h:** Recognize and use the relationship between areas in similar figures **8.4i:** Recognize and use the relationship between volumes in similar figures	**9.4a:** Identify whether a shape is a prism **9.4b:** Construct triangles and nets of 3D solids using compasses and a ruler **9.4c:** Construct a line bisector, perpendicular bisector and angle bisector using compasses and a ruler **9.4d:** Draw a described loci **9.4e:** Make scale drawings and use maps **9.4f:** Use Pythagoras' theorem in right-angled triangles

Curriculum at a glance

Strand	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
	Students can:	Students can:	Students can:	Students can:	Students can:	Students can:	Students can:	Students can:	Students can:
5 Algebra	**1.5a:** Recognize and continue patterns with number and shapes **1.5b:** Find missing terms in sequences and calculations, and represent missing numbers with empty boxes	**2.5a:** Solve balance and missing number problems, such as 9 + ▫ = 6 + 4	**3.5a:** Continue halving and doubling sequences **3.5b:** Solve missing number problems, involving subtraction	**4.5a:** Recognize and extend number sequences, and find the term-to-term rule **4.5b:** Solve missing number problems, involving multiplication and division	**5.5a** Recognize and describe linear number sequences, including those involving fractions and decimals, and find the term-to-term rule	**6.5a:** Use simple formulae **6.5b** Write and describe linear number sequences **6.5c** Use algebra to represent missing number problems **6.5d:** Find pairs of numbers that satisfy an equation with two unknowns and enumerate possibilities of combinations of two variables	**7.5a:** Write simple expressions and formulae using the four operations **7.5b:** Collect like terms in simple expressions **7.5c:** Substitute positive numbers into simple expressions and formulae **7.5d:** Multiply a single positive term over a bracket **7.5e:** Generate and continue sequences **7.5f:** Work out the nth term of an arithmetic sequence **7.5g:** Find the term–to–term rule of a geometric sequence and use it to continue a sequence **7.5h:** Draw straight-line graphs of the form y = mx + c and solve problems involving straight-line graphs	**8.5a:** Write and solve one-step and two-step equations including those with brackets **8.5b:** Solve equations with letters on both sides **8.5c:** Simplify expressions involving powers and brackets **8.5d:** Factorize a single term out of an expression **8.5e:** Substitute positive and negative numbers into simple expressions and formulae **8.5f:** Construct and solve equations **8.5g:** Simplify algebraic fractions with numeric denominators **8.5h:** Solve equations involving algebraic fractions with numeric denominators **8.5i:** Perform a simple algebraic proof **8.5j:** Recognize and graph direct proportion **8.5k:** Draw and use distance-time graphs **8.5l:** Interpret non-linear and real-life graphs **8.5m:** Recognize when and why graphs are misleading **8.5n:** Calculate the gradient and y-intercept of a straight-line graph and find the equation of a straight line from its graph **8.5o:** Recognize what makes two lines parallel or perpendicular **8.5p:** Calculate the gradient of a perpendicular line **8.5q:** Find the equation of a perpendicular line **8.5r:** Solve problems involving intersecting straight line **8.5s:** Identify and continue a quadratic sequence **8.5t:** Find an expression for the nth term of a quadratic sequence	**9.5a:** Solve problems involving arithmetic and geometric sequences **9.5b:** Expand two or more pairs of brackets **9.5c:** Substitute integers into expressions and formulae involving powers, roots and brackets **9.5d:** Write expressions, equations and formulae involving more than one variable **9.5e:** Factorize a quadratic where the coefficient of x^2 is 1 **9.5f:** Use the index laws to simplify algebraic expressions and perform calculations **9.5g:** Simplify algebraic fractions with linear denominators **9.5h:** Solve equations involving algebraic fractions with linear denominators **9.5i:** Solve linear inequalities **9.5j:** Represent an inequality on a number line **9.5k:** Represent inequalities on a graph **9.5l:** Rearrange equations and change the subject of an equation **9.5m:** Solve simultaneous equations **9.5n:** Recognize and use direct and inverse variation **9.5o:** Identify and use trigonometric ratios in right-angled triangles **9.5p:** Find the distance between two points **9.5q:** Solve problems involving straight lines

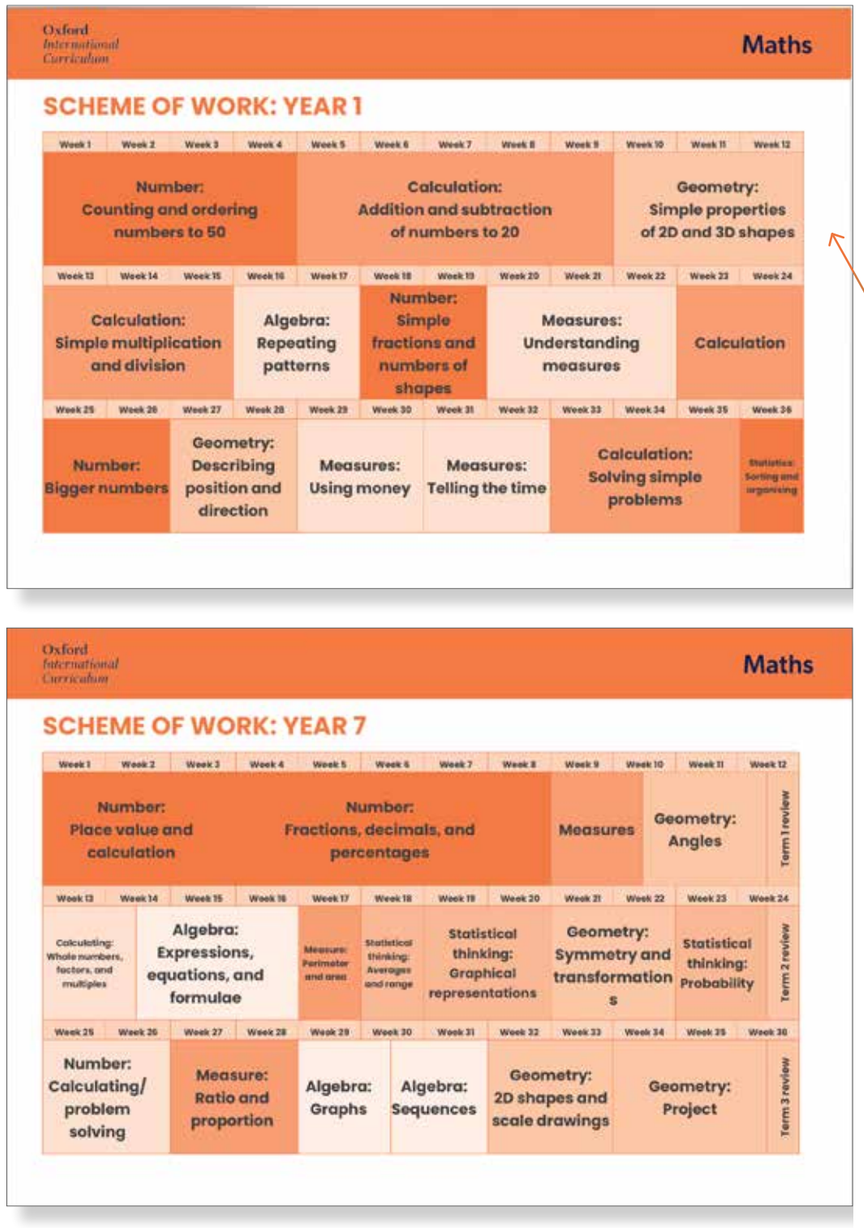
Curriculum at a glance

Strand	Year 1	Year 2	Year 3	Year 4	Year 5
	Students can:	Students can:	Students can:	Students can:	Students can:
6 Statistical thinking ■ **Statistics** ■ **Probability**	**1.6a:** Read and complete number lines in preparation for reading scales on graphs **1.6b:** Sort shapes and objects into groups	**2.6a:** Construct and use simple statistical tables and diagrams, including pictograms, tally charts and block diagrams **2.6b:** Organize and compare collated information **2.6c:** Answer questions involving categorical data	**3.6a:** Solve one-step and two-step real-life questions, interpret and present data using bar charts, pictograms and tables	**4.6a:** Collect, present and interpret discrete and continuous data using various graphical methods **4.6b:** Compare and choose appropriate scales for graphs **4.6c:** Solve comparison, sum and difference problems	**5.6a:** Complete, read and interpret information in tables, including timetables **5.6b:** Interpret and present discrete and continuous data using appropriate graphical methods **5.6c:** Interpret and construct line graphs and use them to solve comparison, sum and difference problems

Year 6	Year 7	Year 8	Year 9
Students can:	Students can:	Students can:	Students can:
6.6a: Construct, interpret and use pie charts and line graphs **6.6b:** Calculate the mean from a small set of numbers and interpret the mean as an average	**7.6a:** Find the mode, median and range from a list or table **7.6b:** Calculate and interpret the mean from a list **7.6c:** Solve problems involving averages and range, and use averages and range to compare sets of data **7.6d:** Identify and group discrete and continuous data **7.6e:** Design, use and interpret various statistical tables, graphs and diagrams **7.6f:** Use and interpret probability scales **7.6g:** Calculate and compare probabilities **7.6h:** Calculate the probability of an event not happening	**8.6a:** Calculate and interpret the mean from a table **8.6b:** Identify the most appropriate average to use in a given situation **8.6c:** Design and use two-way tables and tables for grouped data **8.6d:** Draw and interpret a histogram **8.6e:** Draw and interpret a box plot **8.6f:** Draw and interpret a cumulative frequency curve **8.6g:** Find the quartiles and interquartile range **8.6h:** Perform simple experiments and accurately record the results **8.6i:** Use experimental probability to estimate probabilities **8.6j:** Calculate and use relative frequency **8.6k:** Calculate expected probabilities **8.6l:** Find a probability from a Venn diagram **8.6m:** Find the probability of an independent event	**9.6a:** Draw and interpret scatter graphs **9.6b:** Describe correlation **9.6c:** Draw and use a line of best fit **9.6d:** Understand and use sample space diagrams **9.6e:** Understand and use combined probabilities **9.6f:** Recognize and use conditional probability **9.6g:** Draw and use tree diagrams

Schemes of work

Schemes of work provide a clear structure for the delivery of the curriculum in each academic year, mapping out scope and sequence, and providing a teaching route which students can follow. They are available at both an overview (week-by-week) and detailed (lesson-by-lesson) level.



Oxford International Curriculum — Maths

SCHEME OF WORK: YEAR 1

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Number: Counting and ordering numbers to 50				Calculation: Addition and subtraction of numbers to 20					Geometry: Simple properties of 2D and 3D shapes		
Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24
Calculation: Simple multiplication and division			Algebra: Repeating patterns		Number: Simple fractions and numbers of shapes		Measures: Understanding measures			Calculation	
Week 25	Week 26	Week 27	Week 28	Week 29	Week 30	Week 31	Week 32	Week 33	Week 34	Week 35	Week 36
Number: Bigger numbers		Geometry: Describing position and direction		Measures: Using money		Measures: Telling the time		Calculation: Solving simple problems			Statistics: Sorting and organising

Oxford International Curriculum — Maths

SCHEME OF WORK: YEAR 7

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	
Number: Place value and calculation			Number: Fractions, decimals, and percentages					Measures		Geometry: Angles		Term 1 review
Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	
Calculating: Whole numbers, factors, and multiples	Algebra: Expressions, equations, and formulae			Measure: Perimeter and area	Statistical thinking: Averages and range	Statistical thinking: Graphical representations		Geometry: Symmetry and transformations		Statistical thinking: Probability		Term 2 review
Week 25	Week 26	Week 27	Week 28	Week 29	Week 30	Week 31	Week 32	Week 33	Week 34	Week 35	Week 36	
Number: Calculating/ problem solving		Measure: Ratio and proportion		Algebra: Graphs	Algebra: Sequences		Geometry: 2D shapes and scale drawings		Geometry: Project			Term 3 review

Curriculum aligned
Every learning objective mapped on to a week-by-week, lesson-by-lesson teaching plan

Multiple views
Schemes of work provided at both weekly and lesson-by-lesson level, for ease of planning

Lesson plans
Lesson titles link in to individual lesson plans

Oxford International Curriculum — Maths

SCHEME OF WORK: YEAR 7

Week		Lesson title	Learning outcomes
		Number: Place value and calculation	
1	1.1	Understanding digits and place value including decimals	7.1c: Determine the value of each digit in any number
	1.2	Reading, writing, and ordering whole numbers	7.1a: Compare and order positive and negative numbers
	1.3	Using a number line	7.1a: Compare and order positive and negative numbers
	1.4	Revision of standard calculation methods: Addition	7.2a: Use written and mental methods to add and subtract positive and negative numbers 7.1d: Use estimates to check answers
2	2.1	Revision of standard calculation methods: Subtraction	7.2a: Use written and mental methods to add and subtract positive and negative numbers 7.1d: Use estimates to check answers
	2.2	Revision of standard calculation methods: Multiplication	8.2a: Multiply and divide positive and negative numbers 7.1d: Use estimates to check answers
	2.3	Revision of standard calculation methods: Division	8.2a: Multiply and divide positive and negative numbers 7.1d: Use estimates to check answers
	2.4	Negative numbers	7.1a: Compare and order positive and negative numbers
3	3.1	Calculating with negative numbers	7.2a: Use written and mental methods to add and subtract positive and negative numbers 8.2a: Multiply and divide positive and negative numbers
	3.2	Rounding	6.1c: Round any whole number to a required degree of accuracy
	3.3	Problem solving including real-life situations	
	3.4	Review and practice of unit 1	
		Number: Fractions, decimals, and percentages	
4	4.1	Understanding fractions	7.1e: Compare and simplify fractions 7.1f: Write one number as a fraction of another and find a fraction of an amount
	4.2	Simplify fractions	7.1e: Compare and simplify fractions
	4.3	Equivalent fractions	7.1e: Compare and simplify fractions
	4.4	Compare and order fractions	7.1e: Compare and simplify fractions
5	5.1	Improper fractions and mixed numbers	5.1k: Write mixed numbers as improper fractions and convert from one form to the other
	5.2	Multiplication of fractions	7.2d: Multiply proper fractions and mixed numbers by positive whole numbers and by fractions

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Lesson plans

Oxford International Curriculum — Maths

YEAR 5 Number and place value
Week 1, Lesson 1: Counting and writing numbers to 1 million
Learning outcome: 5.1a

Context
- This is the first lesson in the unit 'Number and place value'.
- Children will have the opportunity to read, write, and explore the place value in numbers to 1 million.
- This lesson should take around 45 minutes to an hour, although the timing is flexible to suit different timetables.

Materials
digit cards 1–9; dice; place-value counters to 1 000 000; part-whole model; place-value grid; Gattegno chart

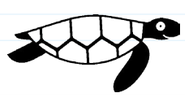
Recommended resources
Oxford International Primary Maths Student Book 5, 2nd ed.
Oxford International Primary Maths Practice Book 5, 2nd ed.
Visual glossary

Lesson summary
Children make numbers, recognize the place value of the digits, and record in words and numerals.

Joy of Learning
GSP Global Skills Projects
- **Curiosity:** Children explore different methods to represent numbers

WB Wellbeing
- **Big question:** Children connect their learning to real-life contexts
- **Discuss mistakes:** Children identify common errors and misconceptions

Vocabulary
hundred, hundred thousand, million, ones, tens, ten thousand, thousand



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Curriculum aligned
Every lesson highlights the learning outcomes it covers, linking back to the curriculum at a glance document

Flexible
Indicative timings are given, but additional activities allow for customization, and differentiation suggestions are provided

Step-by-step
Guidance structured to navigate through the delivery of the lesson

Joy of learning
Opportunities to link to the Global Skills Projects and Wellbeing curricula are highlighted

Oxford International Curriculum — Maths

Introductory activity
- WB Show children different representations of numbers in real life.
- Possible ideas could include: The London Eye cost $25 000 000 to build. There are 26 121 000 people living in Australia. The speed of light is 3 000 000 km per second. Dinosaurs lived 65 000 000 years ago. 1 000 000 days is approximately 2800 years. 1 000 000 seconds is approximately 1 week and 5 days.
- Ask children to choose one number, read the number aloud and describe what the number represents.
- Discuss where they have seen big numbers, such as on food packaging, when reading distances, or population totals.
- WB Give out digit cards 1–9. What different numbers can they make? What can they say about their number? *Do you always have to use all the digits? Who thinks that they have the biggest number?*
- WB Share numbers, discuss any mistakes, and highlight any common misconceptions.

Main activity
- Remind children that numbers are read from left to right.
- Give children a list of numbers in words and get children to fill in the numbers.
- GSP Using the place-value grid (see visual glossary), ask children to suggest numbers that go in each blank. Then read the number. Write the number, pointing out that the spaces and commas are placed in the group of three digits.
- Children now take it in turns to throw dice and generate their own numbers, recording the number as well as the words.
- Now introduce the Gattegno chart (see visual glossary). Place counters on different parts and get children to write the number in numerals and words. Make sure you show some numbers with a zero in different places.
- Now introduce the place-value counters. Take six counters. Ask: *What number does this make?* Counters will be a mix of different values.

Additional tasks
- Children could generate their own numbers and record them using place-value counters and the Gattegno chart. See p.7 of *Student Book 5* and p.14 of *Practice Book 5*.

Learning review
- Children are able to read and write numbers to 1 000 000.
- Children know the place value of each digit.

Differentiation
- Support less confident chidlren by limiting numbers to 10 000 and encourage them to use the Gattegno grid each time.
- Ask more confident children to research instances where larger numbers are used. Look at measurements, population calculations, and graphic representations. Invite children to present their research to their peers.

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Assessment information

Our assessment framework provides a structured way for teachers and students to measure their progress against the learning outcomes, through projects, observations, written work and group work. Year-end tests serve to help teachers assess the student's achievement over the course of any full year of study.

Formative assessment: Assessment for learning is signposted within lesson plans, and teachers are provided with the tools to deliver ongoing, flexible formative assessment through quizzes and question items that can be customized by both level and topic.

Summative assessment: Achievement tests at the end of Year 6, 7, 8, 9.

We envisage that progress will be assessed using a range of tools and settings, including group projects, observations and activities. Learning may be integrated with other subject areas, including the Global Skills Projects and Wellbeing curricula.

The spiral model

The underlying structure of the curriculum has a spiral development model. This means that each learning theme is analyzed into skills areas. These are revisited each year at higher levels of complexity and depth.

The spiral development model reinforces learning and builds on previous achievement. It makes it easier for students to develop and gives coherence and structure to the learning journey.

Maths assessment framework

The assessment framework provides assessment criteria linked to every learning outcome in the curriculum. Teachers will assess students against these criteria, to monitor and confirm students' progress.

In this curriculum, the strands are divided into Number, Calculating, Measure, Ratio and proportion, Geometry, Algebra, and Statistical thinking. Students should be encouraged to ask questions, solve problems, and clearly explain their reasoning across all strands. As their mathematical skills develop, they should begin to see clear links between the various strands. The curriculum will also provide opportunities for cross-curricular links to other subjects, including science, global skills projects, and computing.

This framework can be used as the basis of formal and informal observations of students as their learning progresses through each year, and has been developed to assist teachers in the monitoring of progress. It is organized into statements of developing, secure and extending learning. The statements are intended to be 'can do' statements, where the teacher considers if a student is developing, secure or extending each learning outcome; whether they are working towards, meeting or exceeding each learning outcome.

Judgement should not be based on one observation or a test but arrived at from day-to-day observations. Students should be able to demonstrate their understanding in discussions with their peers and teachers using verbal communication and appropriate mathematical language. They should also communicate their understanding in writing, using pictures and diagrams in addition to actions and play. Evidence should be analysed to decide whether students can achieve the 'can do' statements, or have broadened and deepened their knowledge beyond a given statement.

Students can be assessed at one of three levels:

- **Developing:** The student has made some progress but has not yet achieved the specified learning outcome.
- **Secure:** The student has fully achieved the learning outcome.
- **Extending:** The student has exceeded the learning outcome and achieved additional skills or deeper understanding beyond those specified.

These criteria allow the teacher to acknowledge the achievement of all students including those with additional learning needs. They provide a sound framework to confirm that the class as a whole has reached mastery of the universal learning outcomes and a route to exceptional achievement for students who wish to move more quickly and extend their skills and understanding.

YEAR **ONE**

Introduction

The Year 1 syllabus is designed to introduce the early skills and understanding that will support further learning over the years to come. The understanding of mathematical language is key and students should be encouraged to talk about their maths in activities that encourage application in problem solving and reasoning. These skills should be taught through student-initiated tasks as well as teacher-directed learning.

Learning outcomes

These learning outcomes set out a programme of study in mathematics for Year 1.
During the year, every student will:

1.1a: Count to 50, forwards and backwards
1.1b: Count in multiples of 2, 5, 10 and other small multiples
1.1c: Read and write numbers to 50 in numerals and to 20 in words
1.1d: Compare numbers and quantities to 50, including the use of pictorial representations
1.1e: Identify one greater/fewer than any number of objects to 50
1.1f: Find one more or less than a given number
1.1g: Order numbers to 50
1.1h: Use the early ordinal numbers
1.1i: Use the language of simple fractions
1.1j: Understand the relationship between whole numbers and parts of numbers
1.1k: Know and apply the fact that half is one of two equal parts and one quarter is one of four equal parts
1.2a: Use the language and symbols for addition, subtraction and equality
1.2b: Recognize the relationship between addition and subtraction

1.2c: Add and subtract numbers to 20 including 0
1.2d: Recognize and use number bonds to 20
1.2e: Use part whole reasoning
1.2f: Solve simple addition and subtraction problems using objects or pictorial representations
1.2g: Use grouping and sharing as an introduction to multiplication and division
1.2h: Double and halve simple numbers and quantities
1.2i: Solve simple multiplication and division problems using objects or pictorial representations
1.3a: Compare lengths/heights, masses/weights, capacities/volumes and times
1.3b: Measure and record lengths/heights, masses/weights, capacities/volumes and times
1.3c Solve practical problems involving lengths/heights, masses/weights, capacities/volumes and times
1.3d: Chronologically order events
1.3e: Use the language of time
1.3f: Tell the time to the half hour
1.3g: Know the days of the week and months of the year
1.3h: Recognize and know the value of notes and coins
1.4a: Recognize, name and sort common 2D shapes
1.4b: Recognize, name and sort common 3D shapes
1.4c: Understand how 2D shapes are connected to 3D shapes
1.4d: Use positional and directional language to describe objects
1.4e: Explore and describe half, quarter and three-quarter turns
1.5a: Recognize and continue patterns with number and shapes
1.5b: Find missing terms in sequences and calculations, and represent missing numbers with empty boxes
1.6a: Read and complete number lines in preparation for reading scales on graphs
1.6b: Sort shapes and objects into groups

Assessment criteria

The assessment criteria allow the teacher to assess the level of achievement of each student.

1.1a: *Count to 50, forwards and backwards*

Developing:	The student can count forwards and backwards to 10.
Secure:	The student can count forwards and backwards to 50.
Extending:	The student can use their understanding of counting forwards and backward to 50 to identify missing numbers on grids and number lines.

1.1b: *Count in multiples of 2, 5, 10 and other small multiples*

Developing:	The student can count to 10 in multiples of 2.
Secure:	The student can count to 50 in multiples of 2, 5, 10 and other small multiples.
Extending:	The student can use their understanding of the patterning when counting in 2s, 5s and 10s to predict numbers in the sequence and identify missing numbers.

1.1c: *Read and write numbers to 50 in numerals and to 20 in words*

Developing: The student can read and write numbers to 10 in numerals and in words.

Secure: The student can read and write numbers to 50 in numerals and to 20 in words.

Extending: The student can read and write numbers in their work across the curriculum.

1.1d: *Compare numbers and quantities to 50, including the use of pictorial representations*

Developing: The student can compare numbers and quantities to 10 using objects and pictorial representations.

Secure: The student can compare numbers and quantities to 50 using objects and pictorial representations.

Extending: The student can use their understanding of the size of numbers to solve problems and apply reasoning to comparing numbers.

1.1e: *Identify one greater/fewer than any number of objects to 50*

Developing: The student can identify one greater/fewer than any number to 10.

Secure: The student can identify one greater/fewer than any number to 50.

Extending: The student can apply their understanding of 1 more or 1 less/fewer to solving simple problems and calculations.

1.1f: *Find one more or less than a given number*

Developing: The student can, with support, find one more or less than a given number.

Secure: The student can find one more or less than a given number.

Extending: Students can apply patterning to calculating one more or less, and apply to problem solving.

1.1g: *Order numbers to 50*

Developing: The student can order numbers to 10.

Secure: The student can order numbers to 50.

Extending: Students can use their understanding of numbers to 50 to identify numbers in an incorrect order, identify the size of numbers and solve problems.

1.1h: *Use the early ordinal numbers*

Developing: The student can use the early ordinal numbers.

Secure: The student can use the early ordinal numbers in context.

Extending: The student can use ordinal numbers in context.

1.1i: *Use the language of simple fractions*

Developing: the student understands statements and instructions relating to the language of simple fractions.

Secure: The student can use the language of simple fractions (half and quarter) in describing shapes and quantities.

Extending: The student can use the language of simple fractions in their reasoning and problem solving.

1.1j: *Understand the relationship between whole numbers and parts of numbers*

Developing: The student understands the difference between whole and parts in relation to objects and groups of objects.

Secure: The student is able to identify the whole and the part (half and quarter) using objects and diagrams.

Extending: The student is able to use their knowledge of wholes and parts (half and quarter) to find unknowns in practical contexts

1.1k: *Know and apply the fact that half is one of two equal parts and one quarter is one of four equal parts*

Developing: The student can use objects and diagrams to show that a half is one of two equal parts.

Secure: The student can use objects and diagrams to reason that one half or one quarter of a shape or a group of objects is identified. For example, one half of a shape is shaded.

Extending: The student can use objects and diagrams to show that a half is one of two equal parts, one quarter is one of four equal parts.

1.2a: *Use the language and symbols for addition, subtraction and equality*

Developing: The student can, with support, use the language and symbols for addition, subtraction and equality.

Secure: The student can use the language and symbols for addition, subtraction and equality.

Extending: The student understands the relationship between the language for addition, subtraction, and equality.

1.2b: *Recognize the relationship between addition and subtraction*

Developing: The student understands addition as doing and subtraction as undoing.

Secure: The student identifies a subtraction statement for a given addition statement, for example, 4 + 3 = 7 7 – 3 = 4

Extending: The student fluently uses their knowledge of the relationship between addition and subtraction in problem solving.

1.2c: *Add and subtract numbers to 20 including 0*

Developing: The student can use various methods, including number lines, pictures and objects to add and subtract numbers to 10 including 0.

Secure: The student can use various methods, including number lines, pictures and objects to add and subtract numbers to 20 including 0

Extending: The student can use multiple representations to solve addition and subtraction problems to 20 with unknowns in varying positions e.g ? + 7 = 20.

1.2d: *Recognize and use number bonds to 20*

Developing: The student can recognize and use number bonds to 10.

Secure: The student can recognize and use number bonds to 20.

Extending: The student can recognize and use the relationship between trios of numbers to 20. Identifying patterns and using known facts to support new knowledge.

1.2e: *Use part whole reasoning*

Developing: The student understands that groups of objects can be broken into parts.

Secure: The student can use their understanding of parts and wholes to support problem solving using addition and subtraction to 20.

Extending: The student can use their understanding of the structure of addition and subtraction to solve problems and explain their reasoning.

1.2f: *Solve simple addition and subtraction problems using objects or pictorial representations*

Developing: The student can solve simple addition and subtraction problems to 10 using objects or pictorial representations.

Secure: The student can solve simple addition and subtraction problems to 20 using objects or pictorial representations.

Extending: The student can use their understanding of the structure of simple addition and subtraction problems to solve problems with varying unknowns. For example, Sophie and Matt have 15 stickers altogether. If Sophie has 6 how many has Matt got? Or, Ed has 6 more apples than Ben. Ben has 5. How many does Ed have?

1.2g: *Use grouping and sharing as an introduction to multiplication and division*

Developing: The student can group or share small groups of objects in everyday contexts.

Secure: The student recognizes the link between repeated grouping and multiplication and division.

Extending: The student can apply their understanding of repeated grouping to simple multiplication and division problems.

1.2h: *Double and halve simple numbers and quantities*

Developing: The student can double numbers in everyday contexts.

Secure: The student can use doubling and halving to 20 to solve problems.

Extending: The student can use the relationship between doubling and halving to solve problems and derive new facts.

1.2i: *Solve simple multiplication and division problems using objects or pictorial representations*

Developing: The student can solve simple multiplication and division problems using grouping and sharing

Secure: The student can solve simple multiplication and division problems using apparatus and mental methods.

Extending: The student can apply their understanding of multiplication and division to solving problems and can explain their reasoning.

1.3a: *Compare lengths/heights, masses/weights, capacities/volumes and times*

Developing: The student can make a direct comparison between objects and compare in terms of mass, length and capacity and describe their relationship verbally using appropriate language.

Secure: The student can make comparison between objects and order these in terms of mass, length and capacity and describe their relationship verbally using appropriate language.

Extending: The student can use comparison to solve problems related to measures.

1.3b: *Measure and record lengths/heights, masses/weights, capacities/volumes and times*

Developing: The student can, with support, measure and record lengths/heights, masses/weights, capacities/volumes and using non-standard units.

Secure: The student can measure and record lengths/heights, masses/weights, capacities/volumes with non-standard units and use this in their reasoning.

Extending: The student can use their understanding of measures to solve simple problems.

1.3c: *Solve practical problems involving lengths/heights, masses/weights, capacities/volumes and times*

Developing: The student can, with support, solve simple practical problems involving lengths/heights, masses/weights, capacities/volumes and times.

Secure: The student can solve simple practical problems involving lengths/heights, masses/weights, capacities/volumes and times.

Extending: The student can solve more complex practical problems involving lengths/heights, masses/weights, capacities/volumes and times. The student can explain their reasoning.

1.3d: *Chronologically order events*

Developing: The student can use the language of time to describe the order of events.

Secure: The student can chronologically order a small number of familiar/known events.

Extending: The student can sequence events chronologically and apply this understanding to solving problems.

1.3e: *Use the language of time*

Developing: The student can, with support, use the language of time in simple contexts.

Secure: The student can use the language of time in familiar contexts and reason about their ideas.

Extending: The student can use the language of time in more complex contexts and use the language in reasoning and explanations.

1.3f: *Tell the time to the half hour*

Developing: The student can, with support, tell the time to the half hour.

Secure: The student can tell the time to the half hour.

Extending: The student can use their understanding of reading the clock to the half hour to apply this to simple time problems.

1.3g: *Know the days of the week and months of the year*

Developing: The student can, with support, name the days of the week and months of the year.

Secure: The student can name the days of the week and months of the year.

Extending: The student can use their understanding of weeks and months to apply this to simple problems.

1.3h: *Recognize and know the value of notes and coins*

Developing: The student can identify the value of different coins (to half whatever a single unit of currency is) of their currency.

Secure: The student can identify the value of all the different coins of their currency.

Extending: The student can identify the value of all the different coins of their currency and solve simple money problems.

1.4a: *Recognize, name and sort common 2D shapes*

Developing: The student can, with support, recognize, name and sort squares, rectangles, triangles and circles.

Secure: The student can recognize, name and sort squares, rectangles, triangles and circles.

Extending: The student can recognize, name and sort a wide range of 2D shapes and describe their simple properties using mathematical language.

1.4b: *Recognize, name and sort common 3D shapes*

Developing: The student can, with support, recognize, name and sort cubes, cuboids, pyramids and spheres.

Secure: The student can recognize, name and sort cubes, cuboids, pyramids and spheres.

Extending: The student can recognize, name and sort a wide range of 3D shapes and describe their properties using mathematical language.

1.4c: *Understand how 2D shapes are connected to 3D shapes*

Developing: The student can with support recognize the faces of £D shapes and link these to their understanding of 2D shapes.

Secure: The student can recognize the faces of £D shapes and link these to their understanding of 2D shapes.

Extending: The student can describe 3D shapes with reference to the number and shape of their faces.

1.4d: *Use positional and directional language to describe objects*

Developing: The student can, with support, use simple positional and directional language such as on/under, inside/outside, next to, between, top/middle/bottom.

Secure: The student use simple positional and directional language such as on/under, inside/outside, next to, between, top/middle/bottom.

Extending: The student use simple positional and directional language with measurements such as 5 metres to the left, 10 cm behind etc.

1.4e: *Explore and describe half, quarter and three-quarter turns*

Developing: The student can use diagrams and objects to describe half turns.

Secure: The student can describe half and quarter turns using a variety of methods.

Extending: The student can use their understanding of half and quarter turns to solve problems.

1.5a: *Recognize and continue patterns with number and shapes*

Developing: The student can, with support, recognize and continue simple patterns involving numbers and shapes.

Secure: The student can recognize and continue simple patterns involving numbers and shapes.

Extending: The student can recognize and continue more complex patterns involving numbers and shapes.

1.5b: *Find missing terms in sequences and calculations, and represent missing numbers with empty boxes*

Developing: The student can, with support, find missing terms in simple sequences and calculations and represent missing numbers with empty boxes.

Secure: The student can find missing terms in simple sequences and calculations and represent missing numbers with empty boxes.

Extending: The student can find missing terms in more complex sequences and calculations and represent missing numbers with empty boxes e.g. 2 4 ? ? 10.

1.6a: *Read and complete number lines in preparation for reading scales on graphs*

Developing: The student can, with support, read and complete number lines and scales.

Secure: The student can read and complete number lines and scales.

Extending: The student can use scales in their problem solving and reasoning.

1.6b: *Sort shapes and objects into groups*

Developing: The student can, with support, sort shapes and objects into groups.

Secure: The student can sort shapes and objects into groups using given criteria and recognize how items have been sorted.

Extending: The student can sort and group items using their own and given criteria.

YEAR **TWO**

Introduction

The Year 2 syllabus is designed to allow students to continue to develop their skills and understanding from Year 1. Problem solving and reasoning should be used to help students develop fluency in their maths. Students should also be taught to apply their understanding of mathematics in a variety of everyday contexts.

Learning outcomes

These learning outcomes set out a programme of study in mathematics for Year 2.
During the year, every student will:

2.1a: Count to 100, forwards and backwards

2.1b: Count in multiples of 2, 3 and 5 from 0

2.1c: Count forwards and backwards in tens from any number

2.1d: Read and write numbers to 100 in numerals and words

2.1e: Compare and order numbers and quantities to 100, including the use of <, >, = symbols

2.1f: Find 10 more or less than a given number

2.1g: Give a numerical estimate of a quantity

2.1h: Partition numbers into tens and ones

2.1i: Use place value apparatus and part-whole reasoning to solve problems

2.1j: Round to the next multiple of ten

2.1k: Count on from any number in halves and quarters to 10

2.1l: Write simple fractions using fraction notation

2.1m: Recognize the simple non-unit fractions $\frac{2}{4}$ as 2 out of 4, $\frac{3}{4}$ as 3 out of 4

2.1n: Recognize and use the facts that one half is equal to two quarters and that one third is one of three equal parts

2.2a: Recall and use addition and subtraction facts to 20

2.2b: Add and subtract 1-digit and 2-digit numbers

2.2c: Use understanding of number bonds to 10 to derive number bonds to 100

2.2d: Use addition and subtraction to solve problems

2.2e: Use the inverse relationship between addition and subtraction to solve problems and to check working

2.2f: Understand that addition is commutative, but subtraction is not

2.2g: Use the language and symbols for multiplication and division

2.2h: Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables

2.2i: Use the inverse relationship between multiplication and division to solve problems and to check working

2.2j: Understand that multiplication is commutative, but division is not

2.2k: Find and represent $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of an amount

2.3a: Use appropriate apparatus to measure length/height, mass/weight, volume/capacity and temperature

2.3b: Use appropriate standard units of length/height (m/cm), mass/weight (kg/g), volume/capacity (l/ml), and temperature (°C)

2.3c: Compare and order measurements, including use of <, >, = symbols

2.3d: Compare and sequence intervals of time

2.3e: Tell and write the time to five minutes, including quarter past/to the hour, and draw the hands on a clock face to show these times

2.3f: Know the number of minutes in an hour and the number of hours in a day

2.3g: Solve simple addition and subtraction problems with money in local currency and show equivalences

2.3h: Make different amounts of money with coins and notes

2.4a: Identify and describe simple properties of 2D and 3D shapes, including line symmetry in a vertical line, and compare and sort them

2.4b: Identify and describe the properties of 3D shapes, including the number of edges, vertices and faces

2.4c: Give and follow position, direction and movement instructions, including forwards, backwards, clockwise, anti-clockwise and turns in right angles

2.5a: Solve balance and missing number problems, such as 9 + ☐ = 6 + 4

2.6a: Construct and use simple statistical tables and diagrams, including pictograms, tally charts and block diagrams

2.6b: Organize and compare collated information

2.6c: Answer questions involving categorical data

Assessment criteria

The assessment criteria allow the teacher to assess the level of achievement of each student.

2.1a: *Count to 100, forwards and backwards*

Developing: The student can count forwards and backwards to 50.

Secure: The student can count forwards and backwards to 100.

Extending: The student can use their understanding of counting forwards and backward to 100 to identify missing numbers on grids and number lines.

2.1b: *Count in multiples of 2, 3 and 5 from 0*

Developing: The student can count to 50 in multiples of 2 and 5.

Secure: The student can count to 100 in multiples of 2, 3, 5 from 0.

Extending: The student can use their understanding of the patterning when counting in 2s, 3s and 5s to predict numbers in the sequence and identify missing numbers.

2.1c: *Count forwards and backwards in tens from any number*

Developing: The student can count forwards and backwards in tens from any number within 50.

Secure: The student can count forwards and backwards in tens from any number within 100.

Extending: The student can predict numbers in the sequence and identify missing numbers when counting forwards and backwards in 10s to predict numbers in the sequence and identify missing numbers.

2.1d: *Read and write numbers to 100 in* numerals and *words*

Developing: The student can read and write numbers to 50 in words.

Secure: The student can read and write numbers to 100 in words.

Extending: The student can read and write numbers to 100 in their work across the curriculum.

2.1e: *Compare and order numbers and quantities to 100, including the use of* of <, >, = *symbols*

Developing: The student can compare and order numbers and quantities to 50, including the use of <, > and = symbols.

Secure: The student can compare and order numbers and quantities to 100, including the use of <, > and = symbols.

Extending: The student can use their understanding of the size of numbers to solve problems and apply reasoning to comparing numbers, including the use of <, > and = symbols.

2.1f: *Find 10 more or less than a given number*

Developing: The student can, with support, find 10 more or less than a given number

Secure: The student can find 10 more or less than a given number.

Extending: The student can apply patterning to calculating 10 more or less and apply to problems solving.

2.1g: *Give a numerical estimate of a quantity*

Developing: The student can, with support, estimate the number of objects in a small group.

Secure: The student can estimate the number of objects in a small group.

Extending: The student can estimate the number of objects in a wide range of situations.

2.1h: *Partition numbers into tens and ones*

Developing: The student can, with support, partition numbers to 50 into tens and ones.

Secure: The student can, partition numbers to 50 into tens and ones.

Extending: The student can use partitioning of numbers to 50 to solve problems.

2.1i: *Use place value apparatus and part-whole reasoning to solve problems*

Developing: The student can, with support, use place value apparatus and part whole reasoning to solve problems.

Secure: The student can use place value apparatus and part whole reasoning to solve problems.

Extending: The student can use part whole reasoning to solve problems.

2.1j: *Round to the next multiple of ten*

Developing: The student can, with support, round to the next multiple of ten within 50.

Secure: The student can round to the next multiple of ten within 100.

Extending: The student can round to the next multiple of ten within 100 and solve related problems.

2.1k: *Count on from any number in halves and quarters to 10*

Developing: The student can, with support, count on from any number in halves to 10.

Secure: The student can count on from any number in halves and quarters to 10.

Extending: The student can use their understanding of the patterning when counting on in halves and quarters to predict numbers in the sequence and identify missing numbers.

2.1l: *Write simple fractions using fraction notation*

Developing: The student can, with support, write simple fractions such as $\frac{1}{4}$ and $\frac{1}{2}$ using fraction notation.

Secure: The student can write simple fractions such as $\frac{1}{4}$ and $\frac{1}{2}$ using fraction notation.

Extending: The student can write simple fractions such as $\frac{1}{4}$ and $\frac{1}{2}$ using fraction notation and can solve related problems.

2.1m: *Recognize the simple non-unit fractions $\frac{2}{4}$ as 2 out of 4, $\frac{3}{4}$ as 3 out of 4*

Developing: The student can, with support, recognize the simple non-unit fractions $\frac{2}{4}$ as 2 out of 4, $\frac{3}{4}$ as 3 out of 4.

Secure: The student can recognize the simple non-unit fractions $\frac{2}{4}$ as 2 out of 4, $\frac{3}{4}$ as 3 out of 4.

Extending: The student can recognize a range of non-unit fractions.

2.1n: *Recognize and use the facts that one half is equal to two quarters and that one third is one of three equal parts*

Developing: The student can, with support, recognize and use the facts that one half is equal to two quarters and that one third is one of three equal parts.

Secure: The student can recognize and use the facts that one half is equal to two quarters and that one third is one of three equal parts.

Extending: The student can apply their understanding of the facts that one half is equal to two quarters and that one third is one of three equal parts in solving problems.

2.2a: *Recall and use addition and subtraction facts to 20*

Developing: The student can recall and use addition and subtraction facts to 10.

Secure: The student can recall and use addition and subtraction facts to 20.

Extending: The student can recall and use addition and subtraction facts to 20 to solve problems.

2.2b: *Add and subtract 1-digit and 2-digit numbers*

Developing: The student can add and subtract 1-digit numbers.

Secure: The student can add and subtract 2-digit numbers.

Extending: The student can add and subtract 2-digit numbers and solve related problems.

2.2c: *Use understanding of number bonds to 10 to derive number bonds to 100*

Developing: The student can, with support, use understanding of number bonds to 10 to derive number bonds to 50.

Secure: The student can use understanding of number bonds to 10 to derive number bonds to 100.

Extending: The student can use their understanding of number bonds to 10 solve problems with numbers to 100.

2.2d: *Use addition and subtraction to solve problems*

Developing: The student can, with support, use addition and subtraction to solve problems to 20.

Secure: The student can use addition and subtraction to solve problems to 100.

Extending: The student can use their understanding of addition and subtraction to solve problems to 100 with unknowns in various positions.

2.2e: *Use the inverse relationship between addition and subtraction to solve problems and to check working*

Developing: The student can, with support, use the inverse relationship between addition and subtraction to solve problems and to check working.

Secure: The student can use the inverse relationship between addition and subtraction to solve problems and to check working.

Extending: The student can use their understanding of the inverse relationship between addition and subtraction to solve problems with unknowns in various positions and to check working.

2.2f: *Understand that addition is commutative, but subtraction is not*

Developing: The student can, with support, understand that addition is commutative, but subtraction is not.

Secure: The student can understand that addition is commutative, but subtraction is not.

Extending: The student can demonstrate examples to show that addition is commutative, but subtraction is not.

2.2g: *Use the language and symbols for multiplication and division*

Developing: The student can, with support, use the language and symbols for multiplication and division.

Secure: The student can use the language and symbols for multiplication and division.

Extending: The student can use the language and symbols for multiplication and division to solve one-step problems.

2.2h: *Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables*

Developing: The student can, with support, recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables.

Secure: The student can recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables.

Extending: The student can recall and use knowledge of multiplication and division facts for the 2, 5 and 10 multiplication tables to solve problems.

2.2i: *Use the inverse relationship between multiplication and division to solve problems and to check working*

Developing: The student can, with support, use the inverse relationship between multiplication and division to solve problems and to check working.

Secure: The student can use the inverse relationship between multiplication and division to solve problems and to check working.

Extending: The student can use their understanding of the inverse relationship between multiplication and division to solve more complex problems and to check working.

2.2j: *Understand that multiplication is commutative, but division is not*

Developing: The student can, with support, understand that multiplication is commutative, but division is not.

Secure: The student can understand that multiplication is commutative, but division is not.

Extending: The student can demonstrate examples to show that multiplication is commutative, but division is not.

2.2k: *Find and represent $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of an amount*

Developing: The student can, with support, find and represent $\frac{1}{3}$ and of a group of objects.

Secure: The student can find and represent $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of an amount.

Extending: The student can find and represent $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of an amount and use this information to solve related problems.

2.3a: *Use appropriate apparatus to measure length/height, mass/weight, volume/capacity and temperature*

Developing: The student can, with support, use appropriate apparatus to measure length/height, mass/weight, volume/capacity and temperature.

Secure: The student can use appropriate apparatus to measure length/height, mass/weight, volume/capacity and temperature.

Extending: The student can select and use the appropriate apparatus to measure length/height, mass/weight, volume/capacity and temperature.

2.3b: *Use appropriate standard units of length/height (m/cm), mass/weight (kg/g), volume/capacity (l/ml), and temperature (°C)*

Developing: The student can, with support, use appropriate standard units of length/height (cm and m), mass/weight (g and kg), volume/capacity (ml and l) and temperature (°C).

Secure: The student can use appropriate standard units of length/height (cm and m), mass/weight (g and kg), volume/capacity (ml and l) and temperature (°C).

Extending: The student can use select and use appropriate standard units of length/height (cm and m), mass/weight (g and kg), volume/capacity (ml and l) and temperature (°C).

2.3c: *Compare and order measurements, including use of <, >, = symbols*

Developing: The student can, with support, compare measurements, including use of <, >, = symbols.

Secure: The student can compare measurements, including use of <, >, = symbols.

Extending: The student can compare measurements, including use of <, >, = symbols and solve related problems.

2.3d: *Compare and sequence intervals of time*

Developing: The student can, with support, compare and sequence intervals of time in multiples of 15 minutes.

Secure: The student can compare and sequence intervals of time in multiples of 5 minutes.

Extending: The student can compare and sequence intervals of time in multiples of 5 minutes and can solve related problems.

2.3e: *Tell and write the time to five minutes, including quarter past/to the hour, and draw the hands on a clock face to show these times*

Developing: The student can, with support, tell and write the time to fifteen minutes, including quarter past/to the hour, and draw the hands on a clock face to show these times.

Secure: The student can read the time to the nearest 5 minutes, including quarter to and past the hour. They can draw the hands on a clock face to show these times.

Extending: The student can read the time to the nearest 5 minutes, including quarter to and past the hour, and apply this knowledge to solving problems related to the passing of time.

2.3f: *Know the number of minutes in an hour and the number of hours in a day*

Developing: The student knows the number of minutes in an hour.

Secure: The student knows the number of minutes in an hour and the number of hours in a day.

Extending: The student can use their knowledge of the number of minutes in an hour and hours in a day to solve simple problems.

2.3g: *Solve simple addition and subtraction problems with money in local currency and show equivalences*

Developing: The student can, with support, solve addition and subtraction problems with money in local currency and show equivalences.

Secure: The student can solve addition and subtraction problems with money in local currency and show equivalences.

Extending: The student can apply their understanding of their local currency to solve problems and explain their reasoning.

2.3h: *Make different amounts of money with coins and notes*

Developing: The student can, with support, make different amounts of money with coins and notes.

Secure: The student can make different amounts of money with coins and notes.

Extending: The student can use their understanding of coins and notes to solve related problems.

2.4a: *Identify and describe simple properties of 2D and 3D shapes, including line symmetry in a vertical line, and compare and sort them*

Developing: The student can, with support, identify and describe simple properties of 2D and 3D shapes, *including line symmetry in a vertical line,* and compare and sort them.

Secure: The student can identify and describe simple properties of 2D and 3D shapes, *including line symmetry in a vertical line,* and compare and sort them.

Extending: The student can apply their understanding of the properties of 2D and 3D shapes, *including line symmetry in a vertical line,* to answering questions and problem solving.

2.4b: *Identify and describe the properties of 3D shapes, including the number of edges, vertices and faces*

Developing: The student can, with support, identify and describe the properties of 3D shapes, including the number of edges, vertices and faces.

Secure: The student can identify and describe the properties of 3D shapes, including the number of edges, vertices and faces.

Extending: The student can use the properties of 3D shapes, including the number of edges, vertices and faces, to identify a range of 3D shapes.

2.4c: *Give and follow position, direction and movement instructions, including forwards, backwards, clockwise, anti-clockwise and turns in right angles*

Developing: The student can, with support, give and follow position, direction and movement instructions, including forwards and backwards, left and right.

Secure: The student can give and follow position, direction and movement instructions, including forwards and backwards, left and right, clockwise, anti-clockwise and turns in right angles.

Extending: The student can apply their understanding of direction and movement to solving problems and explain their reasoning.

2.5a: *Solve balance and missing number problems, such as* $9 + \square = 6 + 4$

Developing: The student can, with support, solve missing number problems.

Secure: The student can solve missing number problems.

Extending: The student can solve more missing number problems with the missing number in various positions.

2.6a: *Construct and use simple statistical tables and diagrams, including pictograms, tally charts and block diagrams*

Developing: The student can, with support, use simple statistical tables and diagrams, including pictograms, tally charts and block diagrams.

Secure: The student can construct and use simple statistical tables and diagrams, including pictograms, tally charts and block diagrams.

Extending: The student can use their understanding of simple statistical tables and diagrams to answer questions and explain their reasoning.

2.6b: *Organize and compare collated information*

Developing: The student can, with support, organize and compare a set of collated information.

Secure: The student can organize and compare a set of collated information.

Extending: The student can organize and compare more than one set of collated information.

2.6c: *Answer questions involving categorical data*

Developing: The student can, with support, answer questions involving categorical data.

Secure: The student can answer questions involving categorical data.

Extending: The student can answer questions involving different types of data.

YEAR **THREE**

Introduction

The focus of teaching in Year 3 should be to ensure that pupils become increasingly fluent with whole numbers, the four operations and the concept of place value. Students should develop this fluency mainly through everyday tasks that involve problem solving and reasoning. They should also be taught to use measuring instruments with accuracy and learn to make connections between measure and number.

Learning outcomes

These learning outcomes set out a programme of study in mathematics for Year 3.
During the year, every student will:

3.1a: Count in multiples of 4, 8, 50 and 100 from 0

3.1b Read and write numbers to 1000 in numerals and words

3.1c: Compare and order numbers up to 1000

3.1d: Determine the value of each digit in a 3-digit number

3.1e: Find 100 more or less than a given number

3.1f: Represent and estimate numbers using different representations

3.1g: Partition numbers into hundreds, tens and ones

3.1h: Solve problems involving number to 1000

3.1i: Count forwards and backwards in tenths

3.1j: Relate tenths to decimal measures and division by ten

3.1k: Compare and order fractions with the same denominator

3.1l: Recognize and show, using diagrams, equivalent fractions with small denominators

3.1m: Solve simple problems using fractions

3.2a: Use efficient mental and expanded formal written methods for addition and subtraction of numbers of up to three digits

3.2b: Use addition and subtraction to solve more complex problems

3.2c: Use the inverse relationship between addition and subtraction to solve more complex problems and to check working

3.2d: Add and subtract fractions with the same denominator

3.2e: Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables

3.2f: Use efficient mental and written methods for multiplication and division of a 1-digit or 2-digit number by a 1-digit number

3.2g: Recognize and use the patterning in multiplying and dividing by 10

3.2h: Solve simple two-step problems in context

3.3a: Use appropriate apparatus to measure and compare length/height (m/cm/mm), mass/weight (kg/g) and volume/capacity (l/ml)

3.3b: Express measurements using appropriate mixed units

3.3c: Tell and write the time to the nearest minute using analogue clocks (including using Roman numerals)

3.3d: Convert between 12-hour and 24-hour clock times

3.3e: Know the number of seconds in a minute and the number of days in each month, year and leap year

3.3f: Solve simple problems involving time

3.3g: Calculate how much change must be given in your local currency

3.3h: Solve simple problems, including scaling

3.3i: Measure the perimeter of simple 2D shapes

3.4a: Draw simple 2D shapes

3.4b: Use modelling materials to make 3D shapes

3.4c: Recognize angles as a description of a turn or a property of a shape

34d: Identify acute and obtuse angles

3.4e: Identify horizontal and vertical lines, and recognize when lines are parallel or perpendicular

3.4f: Recognize that a right angle is a quarter turn and that two right angles are a half turn

3.4g: Describe position of 2D shapes on a grid

3.5a: Continue halving and doubling sequences

3.5b: Solve missing number problems, involving subtraction

3.6a: Solve one-step and two-step real-life questions, interpret and present data using bar charts, pictograms and tables

Assessment criteria

The assessment criteria allow the teacher to assess the level of achievement of each student.

3.1a: *Count in multiples of 4, 8, 50 and 100 from 0*

Developing: The student can count to 500 in multiples of 50 and 100.

Secure: The student can count to 500 in multiples of 4, 8, 50 and 100.

Extending: The student can use their understanding of multiples of 4, 8, 50 and 100 to identify missing numbers on grids and number lines.

3.1b *Read and write numbers to 1000 in numerals and words*

Developing: The student can read and write numbers to 500 in numerals and words.

Secure: The student can read and write numbers to 1000 in numerals and words.

Extending: The student can read and write numbers to 1000 in their work across the curriculum.

3.1c: *Compare and order numbers up to 1000*

Developing: The student can compare and order numbers and quantities to 500.

Secure: The student can compare and order numbers and quantities to 1000.

Extending: The student can use their understanding of comparing and ordering numbers to 1000 solve problems.

3.1d: *Determine the value of each digit in a 3-digit number*

Developing: The student can, with support, determine the value of each digit in a 3-digit number.

Secure: The student can determine the value of each digit in a 3-digit number.

Extending: The student can use their understanding of the value of each digit in a 3-digit number to solve problems.

3.1e: *Find 100 more or less than a given number*

Developing: The student can, with support, find 100 more or less than a given number.

Secure: The student can find 100 more or less than a given number.

Extending: The student can find 100 more or less than a given number and solve related problems.

3.1f: *Represent and estimate numbers using different representations*

Developing: The student can, with support, represent and estimate numbers using different representations.

Secure: The student can represent and estimate numbers using different representations.

Extending: The student can use their understanding of estimation to solve problems.

3.1g: *Partition numbers into hundreds, tens and ones*

Developing: The student can, with support, partition numbers into hundreds, tens and ones.

Secure: The student can partition numbers into hundreds, tens and ones.

Extending: The student can use their understanding of partition numbers into hundreds, tens and ones to solve problems.

3.1h: *Solve problems involving number to 1000*

Developing: The student can solve problems involving number to 500.

Secure: The student can solve problems involving number to 1000.

Extending: The student can use their understanding of numbers to 1000 to solve problems and clearly explain their reasoning.

3.1i: *Count forwards and backwards in tenths*

Developing: The student can, with support, count forwards and backwards in tenths.

Secure: The student can count forwards and backwards in tenths.

Extending: The student can count forwards and backwards in tenths and use their understanding to predict numbers in a sequence and identify missing numbers.

3.1j: *Relate tenths to decimal measures and division by ten*

Developing: The student can, with support, relate tenths to decimal measures and division by ten.

Secure: The student can relate tenths to decimal measures and division by ten.

Extending: The student can relate tenths to decimal measures and division by ten and solve related problems.

3.1k: *Compare and order fractions with the same denominator*

Developing: The student can, with support, compare and order fractions with the same denominator.

Secure: The student can compare and order fractions with the same denominator.

Extending: The student can use their understanding of comparing and ordering simple fractions with the same denominator to solve problems.

3.1l: *Recognize and show, using diagrams, equivalent fractions with small denominators*

Developing: The student can, with support, show, using diagrams, equivalent fractions with small denominators.

Secure: The student can show using diagrams, equivalent fractions with small denominators.

Extending: The student can use their knowledge of equivalent fractions with small denominators.

3.1m: *Solve simple problems using fractions*

Developing: The student can, with support, solve problems using fractions.

Secure: The student can solve problems using fractions.

Extending: The student can use their understanding of fractions to solve problems and explain their reasoning.

3.2a: *Use efficient mental and expanded formal written methods for addition and subtraction of numbers of up to three digits*

Developing: The student can, with support, use efficient mental and expanded formal written methods for addition and subtraction of numbers of up to three digits.

Secure: The student can use efficient mental and expanded formal written methods for addition and subtraction of numbers of up to three digits.

Extending: The student can use efficient mental and expanded formal written methods for addition and subtraction of numbers of up to three digits and identify when to use in problem solving.

3.2b: *Use addition and subtraction to solve more complex problems*

Developing: The student can, with support, use addition and subtraction to solve problems.

Secure: The student can use addition and subtraction to solve problems.

Extending: The student can use addition and subtraction to solve more complex problems and explain their reasoning.

3.2c: *Use the inverse relationship between addition and subtraction to solve more complex problems and to check working*

Developing: The student can, with support, use the inverse relationship between addition and subtraction to solve more complex problems and to check working.

Secure: The student can use the inverse relationship between addition and subtraction solve more complex problems and to check working.

Extending: The student can use the inverse relationship between addition and subtraction solve more complex problems and to check working. The student can also clearly explain their reasoning.

3.2d: *Add and subtract fractions with the same denominator*

Developing: The student can, with support, add and subtract fractions with the same denominator.

Secure: The student can add and subtract fractions with the same denominator.

Extending: The student can use their understanding of fractions to solve problems involving adding and subtracting fractions with the same denominator.

3.2e: *Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables*

Developing: The student can, with support, recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.

Secure: The student can recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.

Extending: The student can recall and use knowledge of multiplication and division facts for the 3, 4 and 8 multiplication tables to solve problems.

3.2f: *Use efficient mental and written methods for multiplication and division of a 1-digit or 2-digit number by a 1-digit number*

Developing: The student can, with support, use efficient mental and written methods for multiplication and division of a 1-digit number by a 1-digit number.

Secure: The student can use efficient mental and written methods for multiplication and division of a 1-digit or 2-digit number by a 1-digit number.

Extending: The student can use efficient mental and written methods for multiplication and division and chose when to apply these to solving problems.

3.2g: *Recognize and use the patterning in multiplying and dividing by 10*

Developing: The student can, with support, use the patterning in multiplying and dividing by 10.

Secure: The student can use the patterning in multiplying and dividing by 10.

Extending: The student can use their understanding of the patterning in multiplying and dividing by factors of 10 to solve problems.

3.2h: *Solve simple two-step problems in context*

Developing: The student can, with support, solve simple two-step problems in context.

Secure: The student can solve simple two-step problems in context.

Extending: The student can solve simple two-step problems in context and can clearly explain their reasoning.

3.3a: *Use appropriate apparatus to measure and compare length/height (m/cm/mm), mass/weight (kg/g) and volume/capacity (l/ml)*

Developing: The student can, with support, use appropriate apparatus to measure and compare, using the same units, length (m/cm/mm), mass (kg/g) and volume/capacity (l/ml).

Secure: The student can use appropriate apparatus to measure and compare, using the same units, length (m/cm/mm), mass (kg/g) and volume/capacity (l/ml).

Extending: The student can use appropriate apparatus to measure and compare, using different metric units, length (m/cm/mm), mass (kg/g) and volume/capacity (l/ml).

3.3b: *Express measurements using appropriate mixed units*

Developing: The student can, with support, express some measurements using appropriate mixed units.

Secure: The student can express some measurements using appropriate mixed units.

Extending: The student can use a wide range of measurements and their appropriate mixed units to solve problems.

3.3c: *Tell and write the time to nearest minute using analogue clocks (including using Roman numerals)*

Developing: The student can, with support, tell and write the time to nearest 5 minutes using analogue clocks.

Secure: The student can tell and write the time to nearest 5 minutes using analogue clocks (including using Roman numerals).

Extending: The student can tell and write the time to nearest 5 minutes using analogue clocks (including using Roman numerals) and can solve related problems.

3.3d: *Convert between 12-hour and 24-hour clock times*

Developing: The student can, with support, use diagrams and clocks to convert between 12-hour and 24-hour clock times.

Secure: The student can use diagrams and clocks to convert between 12-hour and 24-hour clock times.

Extending: The student can mentally convert between 12-hour and 24-hour clock times and apply this to solving problems.

3.3e: *Know the number of seconds in a minute and the number of days in each month, year and leap year*

Developing: The student knows that there are 60 seconds in a minute.

Secure: The student knows that there are 60 seconds in a minute and knows the number of days in each of the months and also knows how many days are in a year and in a leap year.

Extending: The student knows that there are 60 seconds in a minute and knows the number of days in each of the months and also knows how many days are in a year and in a leap year and can solve related problems.

3.3f: *Solve simple problems involving time*

Developing: The student can, with support, solve problems involving time.

Secure: The student can solve problems involving time.

Extending: The student can use their understanding of time to solve problems and clearly explain their reasoning.

3.3g: *Calculate how much change must be given in your local currency*

Developing: The student can, with support, calculate how much change must be given in their local currency.

Secure: The student can calculate how much change must be given in their local currency.

Extending: The student can use their understanding of coins and notes to solve problems involving much change must be given and clearly explain their reasoning

3.3h: *Solve simple problems, including scaling*

Developing: The student can, with support, solve simple problems, including scaling.

Secure: The student can solve simple problems, including scaling.

Extending: The student can identify scaling structure in problems and explain reasoning.

3.3i: *Measure the perimeter of simple 2D shapes*

Developing: The student can, with support, measure the perimeter of simple 2D shapes.

Secure: The student can measure the perimeter of simple 2D shapes.

Extending: The student can apply their understanding of how to measure the perimeter to solving problems and explain their reasoning.

3.4a: *Draw simple 2D shapes*

Developing: The student can, with support, draw simple 2D shapes.

Secure: The student can draw simple 2D shapes.

Extending: The student can use their understanding of how to draw shapes to support their solving of related problems.

3.4b: *Use modelling materials to make 3D shapes*

Developing: The student can, with support, use modelling materials to make 3D shapes.

Secure: The student can use modelling materials to make 3D shapes.

Extending: The student can use modelling materials to make 3D shapes to help them solve problems.

3.4c: *Recognize angles as a description of a turn or a property of a shape*

Developing: The student can, with support, recognize angles as a description of a turn or a property of a shape.

Secure: The student can recognize angles as a description of a turn or a property of a shape.

Extending: The student can use their knowledge of angles and turns to solve related problems.

3.4d: *Identify acute and obtuse angles*

Developing: The student can, with support, visually identify acute and obtuse angles.

Secure: The student can visually identify acute and obtuse angles.

Extending: The student can identify numerically if an angle is acute or obtuse.

3.4e: *Identify horizontal and vertical lines, and recognize when lines are parallel or perpendicular*

Developing: The student can, with support, identify horizontal and vertical lines.

Secure: The student can identify horizontal and vertical lines and recognize when lines are parallel or perpendicular.

Extending: The student can identify horizontal and vertical lines and give a clear reason why the lines are parallel or perpendicular.

3.4f: *Recognize that a right angle is a quarter turn and that two right angles are a half turn*

Developing: The student can, with support, recognize that a right angle is a quarter turn and that two right angles are a half turn.

Secure: The student can recognize that a right angle is a quarter turn and that two right angles are a half turn.

Extending: The student can use their understanding of right angles to describe turns and explain their reasoning.

3.4g: *Describe position of 2D shapes on a grid*

Developing: The student can, with support, describe position of 2D shapes on a grid.

Secure: The student can describe position of 2D shapes on a grid.

Extending: The student can apply their understanding to solving problems and explain their reasoning.

3.5a: *Continue halving and doubling sequences*

Developing: The student can, with support, continue halving and doubling sequences.

Secure: The student can continue halving and doubling sequences.

Extending: The student can use their understanding of halving and doubling sequences to find missing terms or continue sequences.

3.5b: *Solve missing number problems, involving subtraction*

Developing: The student can, with support, solve missing number problems, involving subtraction.

Secure: The student can solve missing number problems, involving subtraction.

Extending: The student can solve use their understanding of subtractions to solve missing number problems where the missing number is in any position.

3.6a: *Solve one-step and two-step real-life questions, interpret and present data using bar charts, pictograms and tables*

Developing: The student can, with support, solve one-step real-life questions, interpret and present data using bar charts, pictograms and tables.

Secure: The student can solve one and two step real-life questions, interpret and present data using bar charts, pictograms and tables.

Extending: The student can solve one and two step real-life questions, interpret and present data using bar charts, pictograms and tables and can solve related problems.

YEAR **FOUR**

Introduction

In Year 4 students should become fluent in the use of up to the 12 times tables and use this fluency to efficiently reason and solve problems in a range of everyday contexts. They should be taught the importance of using correct spelling and mathematical language.

Learning outcomes

These learning outcomes set out a programme of study in mathematics for Year 4.
During the year, every student will:

4.1a: Count in multiples of 6, 7, 9, 10, 25, 100 and 1000 from 0

4.1b: Count backwards through zero to include negative numbers

4.1c: Compare and order numbers to 10 000

4.1d: Determine the value of each digit in a 4-digit number

4.1e: Find 1000 more or less than a given number

4.1f: Round any number to the nearest 10, 100 or 1000

4.1g: Partition numbers into thousands, hundreds, tens and ones

4.1h: Solve problems involving numbers to 10 000

4.1i: Read Roman numerals to 100

4.1j: Count forwards and backwards in hundredths

4.1k: Relate hundredths to division by 100

4.1l: Use diagrams, including fraction walls, to represent families of common equivalent fractions

4.1m: Recognize and write decimal equivalents for any number of tenths or hundredths and for $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$

4.1n: Understand the effect of dividing a 1-digit or 2-digit number by 10 or 100

4.1o: Compare numbers with the same number of decimal places, up to two decimal places

4.1p: Round decimals with one decimal place to the nearest whole number

4.1q: Solve simple problems involving fractions and decimals to two decimal places

4.2a: Use efficient formal written methods to add and subtract numbers with up to four digits

4.2b: Solve two-step problems in context

4.2c: Estimate and use inverse operations to check answers to a calculation

4.2d: Recall and use multiplication and division facts for the multiplication tables up to 12 × 12

4.2e: Use efficient written methods for multiplication and division of a 2-digit or 3-digit number by a 1-digit number

4.2f: Recognize and use patterning in multiplying and dividing by 10

4.2g: Recognize and use factor pairs and commutativity in mental calculations

4.2h: Solve two-step problems in context

4.2i: Estimate and use inverse operations to check answers to a calculation

4.2j: Continue to use efficient mental methods where appropriate

4.3a: Estimate, measure and record different measures

4.3b: Convert between different units of measure of length, mass and capacity

4.3c: Explore perimeter and area, by counting squares, with rectilinear shapes

4.3d: Interpret negative numbers in the context of temperature

4.3e: Read, write and convert between analogue and digital 12-hour and 24-hour clock times

4.3f: Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days

4.3g: Solve simple money problems involving fractions and decimals to two decimal places

4.3h: Solve positive integer scaling problems in a variety of contexts

4.4a: Compare and classify geometric shapes based on their properties and sizes

4.4b: Explore line symmetry in 2D shapes

4.4c: Draw a pair of axes with equal scales and numbering

4.4d: Read, write and use coordinates on a grid in the first quadrant to identify a position

4.4e: Describe movements between positions as translations of a given unit to the left/right and up/down

4.4f: Plot given points and draw sides to complete a given polygon

4.5a: Recognize and extend number sequences, and find the term-to-term rule

4.5b: Solve missing number problems, involving multiplication and division

4.6a: Collect, present and interpret discrete and continuous data using various graphical methods

4.6b: Compare and choose appropriate scales for graphs

4.6c: Solve comparison, sum and difference problems

Assessment criteria

The assessment criteria allow the teacher to assess the level of achievement of each student.

4.1a: *Count in multiples of 6, 7, 9, 10, 25, 100 and 1000 from 0*

Developing:	The student can count in multiples of 10, 25 and 100.
Secure:	The student can count in multiples of 6, 7, 9, 10, 25, 100 and 1000.
Extending:	The student can use their understanding of multiples of 6, 7, 9, 10, 25, 100 and 1000 to solve related problems.

4.1b: *Count backwards through zero to include negative numbers*

Developing:	The student can, with support, count backwards through zero to include negative numbers.
Secure:	The student can count backwards through zero to include negative numbers.
Extending:	The student can count backwards through zero to include negative numbers and apply this understanding to solving problems that involve calculation.

4.1c: *Compare and order numbers to 10 000*

Developing:	The student can, with support, compare and order numbers to 10 000.
Secure:	The student can compare and order numbers to 10 000.
Extending:	The student can compare and order numbers to 10 000 and solve related problems.

4.1d: *Determine the value of each digit in a 4-digit number*

Developing: The student can, with support, determine the value of each digit in a 4-digit number.

Secure: The student can determine the value of each digit in a 4-digit number.

Extending: The student can determine the value of each digit in a 4-digit number and can solve related problems.

4.1e: *Find 1000 more or less than a given number*

Developing: The student can, with support, find 1000 more or less than a given number.

Secure: The student can find 1000 more or less than a given number.

Extending: The student can find 1000 more or less than a given number and solve related problems.

4.1f: *Round any number to the nearest 10, 100 or 1000*

Developing: The student can, with support, round any number to the nearest 10, 100 or 1000.

Secure: The student can round any number to the nearest 10, 100 or 1000.

Extending: The student can round any number to the nearest 10, 100 or 1000 and solve related problems.

4.1g: *Partition numbers into thousands, hundreds, tens and ones*

Developing: The student can, with support, partition numbers into thousands, hundreds, tens and ones.

Secure: The student can partition numbers into thousands, hundreds, tens and ones.

Extending: The student can use their understanding of number partitioning into thousands, hundreds, tens and ones to solve problems.

4.1h: *Solve problems involving numbers to 10 000*

Developing: The student can, with support, solve problems involving numbers to 10 000.

Secure: The student can solve problems involving number to 10 000.

Extending: The student can solve problems involving number to 10 000 and clearly explain their reasoning.

4.1i: *Read Roman numerals to 100*

Developing: The student can, with support read Roman numerals to 100.

Secure: The student can read Roman numerals to 100.

Extending: The student can use their understanding of Roman numerals to 100 to solve problems and apply their knowledge across the curriculum.

4.1j: *Count forwards and backwards in hundredths*

Developing: The student can, with support, count forwards and backwards in hundredths.

Secure: The student can count forwards and backwards in hundredths.

Extending: The student can use the patterning when counting forwards and backwards in thousandths to predict numbers in the sequence and identify missing numbers.

4.1k: *Relate hundredths to division by 100*

Developing: The student can, with support, relate hundredths to division by one hundred.

Secure: The student can relate hundredths to division by one hundred.

Extending: The student can relate hundredths to decimal measures and division by one hundred and solve related problems.

4.1l: *Use diagrams, including fraction walls, to represent families of common equivalent fractions*

Developing: The student can, with support, use diagrams, including fraction walls, to represent families of common equivalent fractions.

Secure: The student can use diagrams, including fraction walls, to represent families of common equivalent fractions.

Extending: The student can use multiple mathematical representations to show the relationship between families of common equivalent fractions.

4.1m: *Recognize and write decimal equivalents for any number of tenths or hundredths and for* $\frac{1}{4}$, $\frac{1}{2}$ *and* $\frac{3}{4}$

Developing: The student can, with support, write decimal equivalents for any number of tenths or hundredths and for $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$.

Secure: The student can write decimal equivalents for any number of tenths or hundredths and for $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$.

Extending: The student can write decimal equivalents for any number of tenths or hundredths and for $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$, and solve related problems.

4.1n: *Understand the effect of dividing a 1-digit or 2-digit number by 10 or 100*

Developing: The student can, with support, understand the effect of dividing a 1-digit or 2-digit number by 10 or 100.

Secure: The student can understand the effect of dividing a 1-digit or 2-digit number by 10 or 100.

Extending: The student can understand the effect of dividing a 1-digit or 2-digit number by 10, 100 and use the knowledge in problem solving.

4.1o: *Compare numbers with the same number of decimal places, up to two decimal places*

Developing: The student can, with support, compare numbers with the same number of decimal places, up to two decimal places.

Secure: The student can compare numbers with the same number of decimal places, up to two decimal places.

Extending: The student can compare numbers with the same number of decimal places, up to two decimal places and solve related problems.

4.1p: *Round decimals with one decimal place to the nearest whole number*

Developing: The student can, with support, round decimals with one decimal place to the nearest whole number.

Secure: The student can round decimals with one decimal place to the nearest whole number.

Extending: The student can use their understanding of rounding numbers with one decimal place to the nearest whole number to solve problems.

4.1q: *Solve simple problems involving fractions and decimals to two decimal places*

Developing: The student can, with support, solve problems involving fractions and decimals to two decimal places.

Secure: The student can solve problems involving fractions and decimals to two decimal places.

Extending: The student can solve problems involving fractions and decimals to two decimal places and clearly explain their reasoning.

4.2.a: *Use efficient formal written methods to add and subtract numbers with up to four digits*

Developing: The student can, with support, use efficient formal written methods to add and subtract numbers with up to four digits.

Secure: The student can use efficient formal written methods to add and subtract numbers with up to four digits.

Extending: The student can use their understanding of efficient formal written methods to solve problems involving addition and subtraction of numbers with up to four digits.

4.2b: *Solve two-step problems in context.*

Developing: The student can, with support, solve two-step problems in context

Secure: The student can solve two-step problems in context.

Extending: The student can solve two-step problems in context and clearly explain their reasoning.

4.2.c: *Estimate and use inverse operations to check answers to a calculation*

Developing: The student can, with support, estimate and use inverse operations to check answers to a calculation.

Secure: The student can estimate and use inverse operations to check answers to a calculation.

Extending: The student can estimate and use their understanding of inverse operations to check answers and clearly explain their reasoning.

4.2d: *Recall and use multiplication and division facts for the multiplication tables up to 12 × 12*

Developing: The student can, with support, recall and use multiplication and division facts for the 8-multiplication table.

Secure: The student can recall and use multiplication and division facts for the multiplication tables up to 12 × 12.

Extending: The student can use their understanding of multiplication and division facts for the multiplication tables up to 12 × 12 to solve problems fluently and efficiently.

4.2e: *Use efficient written methods for multiplication and division of a 2-digit or 3-digit number by a 1-digit number*

Developing: The student can, with support, use efficient written methods for multiplication and division of a 2-digit or 3-digit number by a 1-digit number.

Secure: The student can use efficient written methods for multiplication and division of a 2-digit or 3-digit number by a 1-digit number.

Extending: The student can use efficient written methods for multiplication and division of a 2-digit or 3-digit number by a 1-digit number and solve related problems.

4.2f: *Recognize and use patterning in multiplying and dividing by 10*

Developing: The student can, with support, use patterning in multiplying and dividing by 10.

Secure: The student can use patterning in multiplying and dividing by 10.

Extending: The student can use the patterning in multiplying and dividing by 10 to make predictions and solve related problems.

4.2g: *Recognize and use factor pairs and commutativity in mental calculations*

Developing: The student can, with support, use factor pairs and commutativity in mental calculations.

Secure: The student can use factor pairs and commutativity in mental calculations.

Extending: The student can use their understanding of factor pairs and commutativity to do mental calculations when solving problems.

4.2h: *Solve two-step problems in context*

Developing: The student can, with support, solve two-step problems in context.

Secure: The student can solve two-step problems in context.

Extending: The student can apply their understanding to solving problems and explain their reasoning.

4.2i: *Estimate and use inverse operations to check answers to a calculation*

Developing: The student can, with support, estimate and use inverse operations to check answers to a calculation.

Secure: The student can estimate and use inverse operations to check answers to a calculation.

Extending: The student can use their understanding of estimation and inverse operations to check answers to problems and clearly explain their reasoning.

4.2j: *Continue to use efficient mental methods where appropriate*

Developing: The student can, with support, use effiecient mental methods where appropriate.

Secure: The student can *continue to use efficient mental methods where appropriate*.

Extending: The student can show number sense and be able to reason about choices of methods used.

4.3a: *Estimate, measure and record different measures*

Developing: The student can, with support, estimate, measure and record different measures.

Secure: The student can estimate, measure and record different measures.

Extending: The student can estimate, measure, record and analyse the results using different measures.

4.3b: *Convert between different units of measure of length, mass and capacity*

Developing: The student can, with support, convert between different units of measure of length, mass and capacity.

Secure: The student can convert between different units of measure of length, mass and capacity.

Extending: The student can convert between different units of measure of length, mass and capacity and solve related problems.

4.3c: *Explore perimeter and area, by counting squares, with rectilinear shapes*

Developing: The student can, with support, find the perimeter and area, by counting squares, of rectilinear shapes.

Secure: The student can find the perimeter and area, by counting squares, of rectilinear shapes.

Extending: The student can reason about the area and perimeter of rectilinear shapes in problems solving by counting squares.

4.3d: *Interpret negative numbers in the context of temperature*

Developing: The student can, with support, interpret negative numbers in the context of temperature.

Secure: The student can interpret negative numbers in the context of temperature.

Extending: The student can interpret and perform calculations with negative numbers in the context of temperature.

4.3e: *Read, write and convert between analogue and digital 12-hour and 24-hour clock times*

Developing: The student can, with support, read, write and convert between analogue and digital 12-hour and 24-hour clock times.

Secure: The student can read, write and convert between analogue and digital 12-hour and 24-hour clock times.

Extending: The student can read, write and convert between analogue and digital 12-hour and 24-hour clock times and solve related problems.

4.3f: *Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days*

Developing: The student can, with support, solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.

Secure: The student can solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.

Extending: The student can solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days and can solve related problems.

4.3g: *Solve simple money problems involving fractions and decimals to two decimal places*

Developing: The student can, with support, solve money problems involving fractions and decimals to two decimal places.

Secure: The student can solve money problems involving fractions and decimals to two decimal places.

Extending: The student can solve money problems involving fractions and decimals to two decimal places and clearly explain their reasoning.

4.3h: *Solve positive integer scaling problems in a variety of contexts*

Developing: The student can, with support, solve positive integer scaling problems in a variety of contexts.

Secure: The student can solve positive integer scaling problems in a variety of contexts.

Extending: The student can identify scaling structure in problems and explain their resoning.

4.4a: *Compare and classify geometric shapes based on their properties and sizes*

Developing: The student can, with support, compare and classify geometric shapes based on their properties and sizes.

Secure: The student can compare and classify geometric shapes based on their properties and sizes.

Extending: The student can compare and classify geometric shapes based on their properties and sizes and solve related problems.

4.4b: *Explore line symmetry in 2D shapes*

Developing: The student can, with support, identify line symmetry in simple 2D shapes.

Secure: The student can identify line symmetry in simple 2D shapes.

Extending: The student can identify line symmetry in a wide range of 2D shapes and use this to complete pictures and diagrams.

4.4c: *Draw a pair of axes with equal scales and numbering*

Developing: The student can, with support, draw a pair of axes with equal scales and numbering.

Secure: The student can draw a pair of axes with equal scales and numbering.

Extending: The student can analyse a problem and draw a pair of axes with appropriate scales and numbering.

4.4d: *Read, write and use coordinates on a grid in the first quadrant to identify a position*

Developing: The student can, with support, read, write and use coordinates on a grid in the first quadrant to identify a position.

Secure: The student can read, write and use coordinates on a grid in the first quadrant to identify a position.

Extending: The student can use their understanding of coordinates on a grid in the first quadrant to solve problems.

4.4e: *Describe movements between positions as translations of a given unit to the left/right and up/down*

Developing: The student can, with support, describe movements between positions as translations of a given unit to the left/right and up/down.

Secure: The student can describe movements between positions as translations of a given unit to the left/right and up/down.

Extending: The student can describe movements between positions as translations of a given unit to the left/right and up/down and can solve related problems.

4.4f: *Plot given points and draw sides to complete a given polygon*

Developing: The student can, with support, plot given points and draw sides to complete a given polygon in the first quadrant.

Secure: The student can plot given points and draw sides to complete a given polygon in the first quadrant.

Extending: The student can use their understanding of points in the first quadrant to draw polygons and solve related problems.

4.5a: *Recognize and extend number sequences, and find the term-to-term rule*

Developing: The student can, with support, extend number sequences, and find the term-to-term rule of a simple sequence.

Secure: The student can extend number sequences, and find the term-to-term rule of a simple sequence.

Extending: The student can extend number sequences, and find the term-to-term rule of a simple sequence, and use this knowledge to make predictions and solve problems.

4.5b: *Solve missing number problems, involving multiplication and division*

Developing: The student can, with support, solve missing number problems, involving multiplication and division.

Secure: The student can solve missing number problems, involving multiplication and division.

Extending: The student can solve missing number problems, involving multiplication and division and can clearly explain their reasoning.

4.6a: *Collect, present and interpret discrete and continuous data using various graphical methods*

Developing: The student can, with support, collect, present and interpret discrete and continuous data using some graphical methods.

Secure: The student can collect, present and interpret discrete and continuous data using some graphical methods.

Extending: The student can collect, present and interpret discrete and continuous data using a wide range of graphical methods.

4.6b: *Compare and choose appropriate scales for graphs*

Developing: The student can, with support, compare and choose appropriate scales for graphs in simple situations.

Secure: The student can compare and choose appropriate scales for graphs in simple situations.

Extending: The student can compare and choose appropriate scales for graphs in more complex situations.

4.6c: *Solve comparison, sum and difference problems*

Developing: The student can, with support, solve comparison, sum and difference problems.

Secure: The student can solve comparison, sum and difference problems.

Extending: The student can solve comparison, sum and difference problems and clearly explain their reasoning.

YEAR **FIVE**

Introduction

In Year 5 the focus should be to ensure that students extend their understanding of the number system and place value to include larger integers. They should also begin to develop an understanding of the relationship between fractions, decimals, and percentages. There should be continued emphasis placed on the correct spelling and use of mathematical language.

Learning outcomes

These learning outcomes set out a programme of study in mathematics for Year 5.
During the year, every student will:

5.1a: Read and write numbers to at least 1 000 000 in numerals and words

5.1b: Count forwards and backwards to 1 000 000 in steps 10, 100, 1000, 10 000 and 100 000

5.1c: Compare and order numbers to 1 000 000

5.1d: Determine the value of each digit in a 5-digit or 6-digit number

5.1e: Round any number to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000

5.1f: Solve problems involving numbers to 1 000 000

5.1g: Recognize the concept of negative numbers and represent them on a number line

5.1h: Read Roman numerals to 1000 and recognize years written in Roman numerals

5.1i: Compare and order fractions whose denominators are all multiples of the same number

5.1j: Identify, name and write equivalent fractions represented visually

5.1k: Write mixed numbers as improper fractions and convert from one form to the other

5.1l: Read and write decimal numbers as fractions

5.1m: Relate thousandths to tenths, hundredths and decimal equivalents

5.1n: Recognize the percent symbol (%) and understand that percent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal

5.1o: Round decimals with two decimal places to the nearest whole number and to one decimal place

5.1p: Read, write, order and compare numbers with up to three decimal places

5.1q: Solve problems involving numbers up to three decimal places

5.1r: Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25

5.2a: Use written methods to add and subtract numbers with up to four digits

5.2b: Use mental methods to add and subtract increasingly large numbers

5.2c: Solve multi-step problems in context

5.2d: Use rounding to check answers and determine levels of accuracy

5.2e: Add and subtract fractions with the same denominator, and denominators that are multiples of the same number

5.2f: Use formal written methods for multiplying numbers up to four digits by 1-digit and 2-digit numbers

5.2g: Use formal written methods for dividing numbers up to four digits by 1-digit numbers

5.2h: Multiply and divide by 10, 100 and 1000

5.2i: Use known facts to multiply and divide numbers

5.2j: Multiply proper fractions and mixed numbers by whole numbers

5.2k: Identify primes (to 100), factors and multiples

5.2l: Find factor pairs and common factors

5.2m: Use index notation for square numbers and cube numbers

5.2n: Solve multi-step problems, including those involving the use of factors and multiples, squares and cubes

5.3a: Convert between different units of measure of length, mass and capacity

5.3b: Use equivalences between metric and imperial units

5.3c: Measure and calculate perimeters of composite rectilinear shapes

5.3d: Calculate and compare the area of rectangles

5.3e: Correctly use the units of area

5.3f: Estimate volume and capacity

5.3g: Convert between units of time

5.3h: Recognize that percentages, decimals and fractions are different ways of expressing proportions

5.4a: Draw, measure, estimate and compare acute, obtuse and reflex angles

5.4b: Identify and use sum facts about angles that are multiples of 90°, angles on a straight line and angles at a point

5.4c: Draw lines to the nearest mm and use conventional markings for perpendicular and parallel lines

5.4d: Identify 3D shapes from 2D drawings

5.4e: Use properties of rectangles to deduce related facts about missing lengths and angles

5.4f: Distinguish between regular and irregular polygons based on reasoning about side length and angle size

5.4g: Use the language of simple transformations

5.4h: Identify, describe and represent the position of a shape following a translation or a reflection in a horizontal or vertical line, and know that the shape has not changed

5.5a: Recognize and describe linear number sequences, including those involving fractions and decimals, and find the term-to-term rule

5.6a: Complete, read and interpret information in tables, including timetables

5.6b: Interpret and present discrete and continuous data using appropriate graphical methods

5.6c: Interpret and construct line graphs and use them to solve comparison, sum and difference problems

Assessment criteria

The assessment criteria allow the teacher to assess the level of achievement of each student.

5.1a: *Read and write numbers to at least 1 000 000 in numerals and words*

Developing: The student can read and write numbers to 100 000 in numerals and words.

Secure: The student can read and write numbers to 1 000 000 in numerals and words.

Extending: The student uses their reading and writing of numbers to 1 000 000 across their learning.

5.1b: *Count forwards and backwards to 1 000 000 in steps 10, 100, 1000, 10 000 and 100 000*

Developing: The student can, with support, count forwards and backwards to 1 000 000 in steps 10, 100, 1000, 10 000 and 100 000.

Secure: The student can count forwards and backwards to 1 000 000 in steps 10, 100, 1000, 10 000 and 100 000.

Extending: The student can use their understanding of the patterning of counting in steps of 10, 100, 1000, 10 000 and 100 000 to make predictions and identify missing values.

5.1c: *Compare and order numbers to 1 000 000*

Developing: The student can compare and order numbers to 100 000.

Secure: The student can compare and order numbers to 1 000 000.

Extending: The student can use comparison and order of numbers to 1 000 000 to solve problems and explain their reasoning.

5.1d: *Determine the value of each digit in a 5-digit or 6-digit number*

Developing: The student can determine the value of each digit in a 5-digit number.

Secure: The student can apply their knowledge of place value in 5-digit and 6-digit numbers to problem solving and explain their reasoning.

Extending: The student can determine the value of each digit in a 6-digit number and solve related problems.

5.1e: *Round any number to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000*

Developing: The student can, with support, round any number to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.

Secure: The student can round any number to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.

Extending: The student can round any number to 10 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 solve related problems.

5.1f: *Solve problems involving numbers to 1 000 000*

Developing: The student can solve problems involving numbers to 100 000.

Secure: The student can solve problems involving numbers to 1 000 000.

Extending: The student can solve problems involving numbers to 1 000 000 and solve related problems.

5.1g: *Recognize the concept of negative numbers and represent them on a number line*

Developing: The student can, with support, recognize and use negative numbers on a number line.

Secure: The student can, recognize and use negative numbers on a number line.

Extending: The student can use their understanding of negative numbers to solve simple problems using a number line.

5.1h: *Read Roman numerals to 1000 and recognize years written in Roman numerals*

Developing: The student can, with support, read Roman numerals to 1000 and recognize years written in Roman numerals.

Secure: The student can read Roman numerals to 1000 and recognize years written in Roman numerals.

Extending: The student can read Roman numerals to 10 00 and use this knowledge in their work across the curriculum.

5.1i: *Compare and order fractions whose denominators are all multiples of the same number*

Developing: The student can, with support, compare and order fractions whose denominators are all multiples of the same number.

Secure: The student can compare and order fractions whose denominators are all multiples of the same number.

Extending: The student can compare and order fractions whose denominators are multiples of the same number and use this understanding to generalise, make predictions and solve problems.

5.1j: *Identify, name and write equivalent fractions represented visually*

Developing: The student can, with support, identify, name and write equivalent fractions represented visually.

Secure: The student can identify, name and write equivalent fractions represented visually.

Extending: The student can identify, name and write equivalent fractions using multiple representations.

5.1k: *Write mixed numbers as improper fractions and convert from one form to the other*

Developing: The student can, with support, write mixed numbers as improper fractions and convert from one form to the other.

Secure: The student can write mixed numbers as improper fractions and convert from one form to the other.

Extending: The student can write mixed numbers as improper fractions, convert from one form to the other and solve related problems.

5.1l: *Read and write decimal numbers as fractions*

Developing: The student can, with support, read and write simple decimal numbers as fractions.

Secure: The student can read and write simple decimal numbers as fractions.

Extending: The student can read and write decimal numbers as fractions and use their understanding to solve related problems.

5.1m: *Relate thousandths to tenths, hundredths and decimal equivalents*

Developing: The student can, with support, relate thousandths to tenths, hundredths and decimal equivalents.

Secure: The student can relate thousandths to tenths, hundredths and decimal equivalents.

Extending: The student can relate thousandths to tenths, hundredths and decimal equivalents and can solve related problems.

5.1n: *Recognize the percent symbol (%) and understand that percent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal*

Developing: The student can recognize the percent symbol (%) and understand that percent relates to 'number of parts per hundred', and with support write percentages as a fraction with denominator 100, and as a decimal.

Secure: The student can recognize the percent symbol (%) and understand that percent relates to 'number of parts per hundred' and write percentages as a fraction with denominator 100, and as a decimal.

Extending: The student can recognize the percent symbol (%) and understand that percent relates to 'number of parts per hundred' and write percentages as a fraction with denominator 100, and as a decimal. The student can also solve problems involving percentages.

5.1o: *Round decimals with two decimal places to the nearest whole number and to one decimal place*

Developing: The student can, with support, round decimals with two decimal places to the nearest whole number and to one decimal place.

Secure: The student can round decimals with two decimal places to the nearest whole number and to one decimal place.

Extending: The student can round decimals with two decimal places to the nearest whole number and to one decimal place and can solve related problems.

5.1p: *Read, write, order and compare numbers with up to three decimal places*

Developing: The student can, with support, read, write, order and compare numbers with up to three decimal places.

Secure: The student can, with support order and compare numbers with up to three decimal places.

Extending: The student can, with support order and compare numbers with up to three decimal places and can solve related problems.

5.1q: *Solve problems involving numbers up to three decimal places*

Developing: The student can, with support, solve problems involving numbers up to three decimal places.

Secure: The student can solve problems involving numbers up to three decimal places.

Extending: The student can solve problems involving numbers up to three decimal places and can clearly explain their reasoning.

5.1r: *Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25*

Developing: The student can, with support, solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25.

Secure: The student can solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25.

Extending: The student can solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25 and can clearly explain their reasoning.

5.2a: *Use written methods to add and subtract numbers with up to four digits*

Developing: The student can, with support, use efficient written methods to add and subtract numbers with up to *four* digits.

Secure: The student can use efficient written methods to add and subtract numbers with up to *four* digits.

Extending: The student can use efficient written methods to add and subtract numbers with up to *four* digits and solve related problems.

5.2b: *Use mental methods to add and subtract increasingly large numbers*

Developing: The student can, with support, use mental methods to add and subtract numbers within 100 000.

Secure: The student can, with support, use mental methods to add and subtract numbers within 1 000 000.

Extending: The student can, with support, use mental methods to add and subtract numbers within 1 000 000 and can solve related problems.

5.2c: *Solve multi-step problems in context*

Developing: The student can, with support, solve one-step and two-step problems in context.

Secure: The student can solve multi-step problems in context.

Extending: The student can solve multi-step problems in context and clearly explain their reasoning.

5.2d: *Use rounding to check answers and determine levels of accuracy*

Developing: The student can, with support, use rounding to check answers and determine levels of accuracy.

Secure: The student can use rounding to check answers and determine levels of accuracy.

Extending: The student can use rounding to check answers and determine levels of accuracy and can clearly explain their reasoning.

5.2e: *Add and subtract fractions with the same denominator, and denominators that are multiples of the same number*

Developing: The student can, with support, add and subtract fractions with the same denominator, and denominators that are multiples of the same number.

Secure: The student can add and subtract fractions with the same denominator, and denominators that are multiples of the same number.

Extending: The student can add and subtract fractions with the same denominator, and with different denominators.

5.2f: *Use formal written methods for multiplying numbers up to four digits by 1-digit and 2-digit numbers*

Developing: The student can, with support, use formal written methods for multiplying numbers up to four digits by 1-digit and-2-digit numbers.

Secure: The student can use formal written methods for multiplying numbers up to four digits by 1-digit and-2-digit numbers.

Extending: The student can use formal written methods for multiplying numbers up to five digits by 1-digit and-2-digit numbers.

5.2g: *Use formal written methods for dividing numbers up to four digits by 1-digit numbers*

Developing: The student can use formal written methods for dividing numbers up to four digits by 1-digit numbers.

Secure: The student can, with support, use formal written methods for dividing numbers up to four digits by 1-digit numbers.

Extending: The student can use formal written methods for dividing numbers up to five digits by 1-digit numbers.

5.2h: *Multiply and divide by 10, 100 and 1000*

Developing: The student can, with support, multiply and divide by 10, 100 and 1000.

Secure: The student can multiply and divide by 10, 100 and 1000.

Extending: The student can multiply and divide by 10, 100, 1000 and 10 000.

5.2i: *Use known facts to multiply and divide numbers*

Developing: The student can, with support, use known facts to multiply and divide numbers up to four digits.

Secure: The student can use known facts to multiply and divide numbers up to four digits.

Extending: The student can, use known facts to multiply and divide numbers up to five digits.

5.2j: *Multiply proper fractions and mixed numbers by whole numbers*

Developing: The student can, with support, multiply proper fractions, and mixed numbers by whole numbers.

Secure: The student can multiply proper fractions and mixed numbers by whole numbers.

Extending: The student can, with support, multiply proper fractions and mixed numbers by whole numbers and solve related one-step problems.

5.2k: *Identify primes (to 100), factors and multiples*

Developing: The student can, with support, identify primes, factors, and multiples to 50.

Secure: The student can identify primes, factors, and multiples to 100.

Extending: The student can identify primes to 100, factors to 1000 and multiples to 1000.

5.2l: *Find factor pairs and common factors*

Developing: The student can, with support, find factor pairs and common factors to 50.

Secure: The student can find factor pairs and common factors to 100.

Extending: The student can, with support, find factor pairs and common factors to 1000.

5.2m: *Use index notation for square numbers and cube numbers*

Developing: The student can, with support, use index notation for square numbers and cube numbers.

Secure: The student can use index notation for square numbers and cube numbers.

Extending: The student can use index notation for square numbers and cube numbers and solve related one-step problems.

5.2n: *Solve multi-step problems, including those involving the use of factors and multiples, squares, and cubes*

Developing: The student can, with support, solve one-step and two-step problems, including those involving the use of factors and multiples, squares, and cubes.

Secure: The student can solve simple multi-step problems, including those involving the use of factors and multiples, squares, and cubes.

Extending: The student can solve more complex multi-step problems, including those involving the use of factors and multiples, squares, and cubes.

5.3a: *Convert between different units of measure of length, mass, and capacity*

Developing: The student can, with support, convert to the next unit of measure of length, mass, and capacity, for example, cm to m.

Secure: The student can convert to the next unit of measure of length, mass, and capacity, for example, cm to m.

Extending: The student can convert between different units of measure of length, mass, and capacity.

5.3b: *Use equivalences between metric and imperial units*

Developing: The student can, with support, use equivalences between metric and imperial units.

Secure: The student can use equivalences between metric and imperial units.

Extending: The student can use equivalences between metric and imperial units and solve related one-step problems.

5.3c: *Measure and calculate perimeters of composite rectilinear shapes*

Developing: The student can, with support, measure and calculate perimeters of composite rectilinear shapes.

Secure: The student can measure and calculate perimeters of composite rectilinear shapes.

Extending: The student can measure and calculate perimeters of composite rectilinear shapes and solve related one-step problems.

5.3d: *Calculate and compare the area of rectangles*

Developing: The student can, with support, calculate and compare the area of rectangles.

Secure: The student can calculate and compare the area of rectangles.

Extending: The student can calculate and compare the area of rectangles and solve related one-step problems.

5.3e: *Correctly use the units of area*

Developing: The student can, with support, correctly use the units of area.

Secure: The student can correctly use the units of area.

Extending: The student can correctly use the units of area and solve related 1-step problems.

5.3f: *Estimate volume and capacity*

Developing: The student can, with support, estimate volume and capacity.

Secure: The student can estimate volume and capacity.

Extending: The student can estimate volume and capacity and solve related 1-step problems.

5.3g: *Convert between units of time*

Developing: The student can, with support, convert between units of time.

Secure: The student can convert between units of time.

Extending: The student can convert between units of time and solve related 1-step problems.

5.3h: *Recognize that percentages, decimals, and fractions are different ways of expressing proportions*

Developing: The student can, with support, recognize that percentages, decimals, and fractions are different ways of expressing proportions.

Secure: The student can recognize that percentages, decimals, and fractions are different ways of expressing proportions.

Extending: The student can recognize that percentages, decimals, and fractions are different ways of expressing proportions and use this recognition to solve related one-step problems.

5.4a: *Draw, measure, estimate and compare acute, obtuse, and reflex angles*

Developing: The student can, with support, draw, measure, estimate and compare acute, obtuse, and reflex angles.

Secure: The student can draw, measure, estimate and compare acute, obtuse, and reflex angles.

Extending: The student can draw, measure, estimate and compare acute, obtuse, and reflex angles and solve related one-step problems.

5.4b: *Identify and use sum facts about angles that are multiples of 90°, angles on a straight line and angles at a point*

Developing: The student can, with support, identify and use sum facts about angles that are multiples of 90°, angles on a straight line and angles at a point.

Secure: The student can identify and use sum facts about angles that are multiples of 90°, angles on a straight line and angles at a point.

Extending: The student can identify and use sum facts about angles that are multiples of 90°, angles on a straight line and angles at a point and solve related one-step problems.

5.4c: *Draw lines to the nearest mm and use conventional markings for perpendicular and parallel lines*

Developing: The student can, with support, draw lines to the nearest mm and use conventional markings for perpendicular and parallel lines.

Secure: The student can draw lines to the nearest mm and use conventional markings for perpendicular and parallel lines.

Extending: The student can draw lines to the nearest mm and use conventional markings for perpendicular and parallel lines and solve related one-step problems.

5.4d: *Identify 3D shapes from 2D drawings*

Developing: The student can, with support, identify 3D shapes, from 2D drawings.

Secure: The student can identify 3D shapes, from 2D drawings.

Extending: The student can identify 3D shapes, from 2D drawings and solve related one-step problems.

5.4e: *Use properties of rectangles to deduce related facts about missing lengths and angles*

Developing: The student can, with support, use properties of rectangles to deduce related facts about missing lengths and angles.

Secure: The student can use properties of rectangles to deduce related facts about missing lengths and angles.

Extending: The student can use properties of rectangles to deduce related facts about missing lengths and angles and solve related one-step problems.

5.4f: *Distinguish between regular and irregular polygons based on reasoning about side length and angle size*

Developing: The student can, with support, distinguish between regular and irregular polygons based on reasoning about side length and angle size.

Secure: The student can distinguish between regular and irregular polygons based on reasoning about side length and angle size.

Extending: The student can distinguish between regular and irregular polygons based on reasoning about side length and angle size and solve related one-step problems.

5.4g: *Use the language of simple transformations*

Developing: The student can, with support, use the language of simple transformations.

Secure: The student can use the language of simple transformations.

Extending: The student can use the language of simple transformations and solve related one-step problems.

5.4h: *Identify, describe, and represent the position of a shape following a translation or a reflection in a horizontal or vertical line, and know that the shape has not changed*

Developing: The student can, with support, identify, describe, and represent the position of a shape following a translation or a reflection in a horizontal or vertical line and know that the shape has not changed.

Secure: The student can identify, describe, and represent the position of a shape following a translation or a reflection in a horizontal or vertical line and know that the shape has not changed.

Extending: The student can identify, describe, and represent the position of a shape following a translation or a reflection in a horizontal or vertical line and know that the shape has not changed and solve related one-step problems.

5.5a: *Recognize and describe linear number sequences, including those involving fractions and decimals, and find the term-to-term rule*

Developing: The student can, with support, recognize and describe linear number sequences, including those involving fractions and decimals, and find the term-to-term rule.

Secure: The student can recognize and describe linear number sequences, including those involving fractions and decimals, and find the term-to-term rule.

Extending: The student can recognize and describe linear number sequences, including those involving fractions and decimals, and find the term-to-term rule and solve related one-step problems.

5.6a: *Complete, read and interpret information in tables, including timetables*

Developing: The student can, with support, complete, read and interpret information in tables, including timetables.

Secure: The student can complete, read, and interpret information in tables, including timetables.

Extending: The student can read and interpret information in tables, including timetables, and solve related one-step problems.

5.6b: *Interpret and present discrete and continuous data using appropriate graphical methods*

Developing: The student can, with support, interpret and present discrete and continuous data using appropriate graphical methods.

Secure: The student can interpret and present discrete and continuous data using appropriate graphical methods.

Extending: The student can interpret, and present discrete and continuous data using appropriate graphical methods and solve related one-step problems.

5.6c: *Interpret and construct line graphs and use them to solve comparison, sum, and difference problems*

Developing: The student can, with support, interpret and construct line graphs and use them to solve one-step comparison, sum, and difference problems.

Secure: The student can, interpret and construct line graphs and use them to solve one-step comparison, sum, and difference problems.

Extending: The student can interpret and construct line graphs and use them to solve one-step and two-step comparison, sum, and difference problems.

YEAR **SIX**

Introduction

In Year 6, students should consolidate their understanding of the number system and place value, including larger integers. They should continue to develop their understanding of the relationship between fractions, decimals, and percentages. Students would learn to identify and classify more complex geometric shapes and learn how to spell and use the associated vocabulary correctly.

Learning outcomes

These learning outcomes set out a programme of study in mathematics for Year 6.
During the year, every student will:

6.1a: Read and write numbers to at least 10 000 000 in numerals and words

6.1b: Determine the value of each digit in a 7-digit or 8-digit number

6.1c: Round any whole number to a required degree of accuracy

6.1d: Calculate across 0 and use negative numbers in context

6.1e: Solve problems involving number to 10 000 000

6.1f: Identify the values of all the digits in a number given to three decimal places

6.1g: Understand that percentages, decimals and fractions are different ways of expressing proportions of a whole, and know the common equivalences

6.2a: Solve multi-step addition and subtraction problems in context, and use estimation to check accuracy

6.2b: Add and subtract mixed numbers and fractions with different denominators

6.2c: Use long multiplication to multiply numbers up to four digits by 2-digit numbers

6.2d: Use long and short division to divide numbers up to four digits by 2-digit numbers, including with remainders (as fractions or as decimals)

6.2e: Use written methods to multiply 1-digit numbers with two decimal places by a whole number

6.2f: Use written methods to perform division where the answer has up to two decimal places

6.2g: Use order of operations to carry out multi-step problems in context and use estimation to check accuracy

6.2h: Use common factors to simplify fractions

6.2i: Multiply simple fractions

6.2j: Multiply and divide numbers by 10, 100 and 1000

6.3a: Solve problems that require conversion between different units of measure

6.3b: Convert between kilometres and miles

6.3c: Recognize that shapes with the same areas can have different perimeters

6.3d: Calculate the areas of parallelograms and triangles

6.3e: Calculate volumes of cubes and cuboids using various units

6.3f: Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples

6.4a: Use given dimensions and angles to draw 2D shapes

6.4b: Identify and build simple 3D shapes, including making nets

6.4c: Classify geometric shapes based on their properties

6.4d: Find unknown angles in any triangles, quadrilaterals, and regular polygons

6.4e: Identify vertically opposite angles

6.4f: Draw and name parts of circles, including radius, diameter and circumference

6.4g: Know that the diameter of a circle is twice the radius

6.4h: Use coordinates in all four quadrants

6.4i: Translate and reflect simple shapes

6.5a: Use simple formulae

6.5b: Write and describe linear number sequences

6.5c: Use algebra to represent missing number problems

6.5d: Find pairs of numbers that satisfy an equation with two unknowns and enumerate possibilities of combinations of two variables

6.6a: Construct, interpret and use pie charts and line graphs

6.6b: Calculate the mean from a small set of numbers and interpret the mean as an average

Assessment criteria

The assessment criteria allow the teacher to assess the level of achievement of each student.

6.1a: *Read and write numbers to at least 10 000 000 in numerals and words*

Developing: The student can read and write numbers to 1 000 000 in numerals and words.

Secure: The student can read and write numbers to 10 000 000 in numerals and words.

Extending: The student uses their reading and writing of numbers to 10 000 000 across their learning.

6.1b: *Determine the value of each digit in a 7-digit or 8-digit number*

Developing: The student can determine the value of each digit in a 6-digit number.

Secure: The student can determine the value of each digit in a 7-digit or 8-digit number.

Extending: The student can determine the value of each digit in any number.

6.1c: *Round any whole number to a required degree of accuracy*

Developing: The student can, with support, round any whole number to a required degree of accuracy.

Secure: The student can round any whole number to a required degree of accuracy.

Extending: The student can round any whole number to a required degree of accuracy and solve related problems.

6.1d: *Calculate across 0 and use negative numbers in context*

Developing: The student can, with support, calculate across 0 and use negative numbers in context.

Secure: The student can calculate across 0 and use negative numbers in context.

Extending: The student can calculate across 0 and use negative numbers in context to solve problems.

6.1e: *Solve problems involving number to 10 000 000*

Developing: The student can solve problems involving numbers to 1 000 000.

Secure: The student can solve problems involving numbers to 10 000 000.

Extending: The student can solve problems involving numbers to 100 000 000.

6.1f: *Identify the values of all the digits in a number given to three decimal places*

Developing: The student can, with support, identify the values of all the digits in a number given to three decimal places.

Secure: The student can identify the values of all the digits in a number given to three decimal places.

Extending: The student can identify the values of all the digits in a number given to any number of decimal places.

6.1g: *Understand that percentages, decimals and fractions are different ways of expressing proportions of a whole, and know the common equivalences*

Developing: The student can understand that percentages, decimals and fractions are different ways of expressing proportions of a whole.

Secure: The student can understand that percentages, decimals and fractions are different ways of expressing proprtions of a whole, and know the common equivalences.

Extending: The student can understand when to use different reprentations and explain their reasoning.

6.2a: *Solve multi-step addition and subtraction problems in context, and use estimation to check accuracy*

Developing: The student can, with support, solve multi-step addition and subtraction problems within 1 000 000 in context, and use estimation to check accuracy.

Secure: The student can, with support, solve multi-step addition and subtraction problems within 1 000 000 in context, and use estimation to check accuracy.

Extending: The student can solve multi-step addition and subtraction problems within 10 000 000 in context, and use estimation to check accuracy.

6.2b: *Add and subtract mixed numbers and fractions with different denominators*

Developing: The student can, with support, add and subtract mixed numbers and fractions with different denominators.

Secure: The student can add and subtract mixed numbers and fractions with different denominators.

Extending: The student can add and subtract mixed numbers and fractions with different denominators and solve related problems in context

6.2c: *Use long multiplication to multiply numbers up to four digits by 2-digit numbers*

Developing: The student can, with support, use long multiplication to multiply numbers up to three digits by 2-digit numbers.

Secure: The student can use long multiplication to multiply numbers up to four digits by 2-digit numbers.

Extending: The student can use long multiplication to multiply numbers up to five digits by 2-digit numbers.

6.2d: *Use long and short division to divide numbers up to four digits by 2-digit numbers, including with remainders (as fractions or as decimals)*

Developing: The student can, with support, use long and short division to divide numbers up to three digits by 2-digit numbers, including with remainders (as fractions or as decimals)

Secure: The Student can use long and short division to divide numbers up to four digits by 2-digit numbers, including with remainders (as fractions or as decimals)

Extending: The Student can use long and short division to divide numbers up to five digits by 2-digit numbers, including with remainders (as fractions or as decimals)

6.2e: *Use written methods to multiply 1-digit numbers with two decimal places by a whole number*

Developing: The student can, with support, use written methods to multiply 1-digit numbers with one decimal place by a whole number.

Secure: The student can use written methods to multiply 1-digit numbers with two decimal places by a whole number.

Extending: The student can use written methods to multiply 1-digit numbers with two decimal places by a whole number and solve related problems.

6.2f: *Use written methods to perform division where the answer has up to two decimal places*

Developing: The student can, with support, use written methods to perform division where the answer has up to one decimal place.

Secure: The student can use written methods to perform division where the answer has up to two decimal places.

Extending: The student can use written methods to perform division where the answer has up to three decimal places.

6.2g: *Use order of operations to carry out multi-step problems in context and use estimation to check accuracy*

Developing: The student can, with support, use order of operations to carry out simple multi-step problems in context and use estimation to check accuracy.

Secure: The student can use order of operations to carry out simple multi-step problems in context and use estimation to check accuracy.

Extending: The student can use order of operations to carry out more complex multi-step problems in context and use estimation to check accuracy.

6.2h: *Use common factors to simplify fractions*

Developing: The student can, with support, use common factors to simplify fractions.

Secure: The student can use common factors to simplify fractions.

Extending: The student can use common factors to simplify fractions and solve related problems.

6.2i *Multiply simple fractions*

Developing: The student can, with support, multiply simple fractions.

Secure: The student can multiply simple fractions.

Extending: The student can multiply simple fractions and solve related problems.

6.2j: *Multiply and divide numbers by 10, 100 and 1000*

Developing: The student can, with support, multiply and divide by 10, 100 and 1000.

Secure: The student can multiply and divide by 10, 100, 1000 and 10 000.

Extending: The student can multiply and divide by 10, 100, 1000, 10 000 and 100 000.

6.3a: *Solve problems that require conversion between different units of measure*

Developing: The student can, with support, solve problems that require conversion between different units of measure.

Secure: The student can solve problems that require conversion between different units of measure.

Extending: The student can solve problems that require conversion between different units of measure and can clearly explain their reasoning.

6.3b: *Convert between kilometres and miles*

Developing: The student can, with support, convert between kilometres and miles.

Secure: The student can convert between kilometres and miles.

Extending: The student can convert between kilometres and miles and solve related problems.

6.3c: *Recognize that shapes with the same areas can have different perimeters*

Developing: The student can, with support, recognize that shapes with the same areas can have different perimeters.

Secure: The student can recognize that shapes with the same areas can have different perimeters.

Extending: The student can recognize that shapes with the same areas can have different perimeters and solve related problems.

6.3d: *Calculate the areas of parallelograms and triangles*

Developing: The student can, with support, calculate the areas of parallelograms and triangles.

Secure: The student can calculate the areas of parallelograms and triangles.

Extending: The student can calculate the areas of parallelograms and triangles and solve related problems.

6.3e: *Calculate volumes of cubes and cuboids using various units*

Developing: The student can, with support, calculate volumes of cubes and cuboids using various units.

Secure: The student can calculate volumes of cubes and cuboids using various units.

Extending: The student can calculate volumes of cubes and cuboids using various units and solve related problems.

6.3f: *Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples*

Developing: The student can, with support, solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

Secure: The student can solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

Extending: The student can solve problems involving unequal sharing and grouping using knowledge of fractions and multiples and can clearly explain their reasoning.

6.4a: *Use given dimensions and angles to draw 2D shapes*

Developing: The student can, with support, use given dimensions and angles to draw simple 2D shapes.

Secure: The student can use given dimensions and angles to draw simple 2D shapes.

Extending: The student can use given dimensions and angles to draw more complex 2D shapes.

6.4b: *Identify and build simple 3D shapes, including making nets*

Developing: The student can, with support, identify and build simple 3D shapes, including making nets.

Secure: The student can identify and build simple 3D shapes, including making nets.

Extending: The student can identify and build more complex 3D shapes, including making nets.

6.4c: *Classify geometric shapes based on their properties*

Developing: The student can, with support, classify simple geometric shapes based on their properties.

Secure: The student can classify simple geometric shapes based on their properties.

Extending: The student can classify more complex geometric shapes based on their properties.

6.4d: *Find unknown angles in any triangles, quadrilaterals, and regular polygons*

Developing: The student can, with support, find unknown angles in any triangles, quadrilaterals, and regular polygons.

Secure: The student can find unknown angles in any triangles, quadrilaterals, and regular polygons.

Extending: The student can find unknown angles in any triangles, quadrilaterals, and regular polygons and solve related problems.

6.4e: *Identify vertically opposite angles*

Developing: The student can, with support, identify vertically opposite angles.

Secure: The student can identify vertically opposite angles.

Extending: The student can identify vertically opposite angles and solve related problems.

6.4f: *Draw and name parts of circles, including radius, diameter, and circumference*

Developing: The student can, with support, draw and name parts of circles, including radius, diameter, and circumference.

Secure: The student can draw and name parts of circles, including radius, diameter, and circumference.

Extending: The student can draw and name parts of circles, including radius, diameter, and circumference and solve related problems.

6.4g: *Know that the diameter of a circle is twice the radius*

Developing: The student can, with support, recognize that the diameter of a circle is twice the radius.

Secure: The student can recognize that the diameter of a circle is twice the radius.

Extending: The student can use the fact that the diameter of a circle is twice the radius to solve related problems.

6.4h: *Use coordinates in all four quadrants*

Developing: The student can, with support, use coordinates in all four quadrants.

Secure: The student can use coordinates in all four quadrants.

Extending: The student can use coordinates in all four quadrants and solve related problems.

6.4i: *Translate and reflect simple shapes*

Developing: The student can, with support, translate and reflect simple shapes.

Secure: The student can translate and reflect simple shapes.

Extending: The student can, with support, translate and reflect simple shapes and solve related problems.

6.5a: *Use simple formulae*

Developing: The student can, with support, use simple formulae.

Secure: The student can use simple formulae.

Extending: The student can use simple formulae and solve related problems.

6.5b: *Write and describe linear number sequences*

Developing: The student can, with support, write and describe linear number sequences.

Secure: The student can write and describe linear number sequences.

Extending: The student can write and describe linear number sequences and solve related problems.

6.5c: *Use algebra to represent missing number problems*

Developing: The student can, with support, use algebra to represent missing number problems.

Secure: The student can use algebra to represent missing number problems.

Extending: The student can use algebra to represent missing number problems and solve related problems.

6.5d: *Find pairs of numbers that satisfy an equation with two unknowns and enumerate possibilities of combinations of two variables*

Developing: The student can, with support, find pairs of numbers that satisfy an equation with two unknowns and enumerate possibilities of combinations of two variables.

Secure: The student can find pairs of numbers that satisfy an equation with two unknowns and enumerate possibilities of combinations of two variables.

Extending: The student can find pairs of numbers that satisfy an equation with two unknowns and enumerate possibilities of combinations of two variables and solve related problems.

6.6a: *Construct, interpret and use pie charts and line graphs*

Developing: The student can, with support, construct, interpret and use pie charts and line graphs.

Secure: The student can construct, interpret and use pie charts and line graphs.

Extending: The student can construct, interpret and use pie charts and line graphs and solve related problems.

6.6b: *Calculate the mean from a small set of numbers and interpret the mean as an average*

Developing: The student can, with support, calculate the mean from a small set of numbers and interpret the mean as an average.

Secure: The student can calculate the mean from a small set of numbers and interpret the mean as an average.

Extending: The student can calculate the mean from a small set of numbers and interpret the mean as an average and solve related problems.

YEAR **SEVEN**

Introduction

In Year 7, students will be taught to consolidate and extend the mathematical skills learned in the primary years. They should develop fluency with the number system and use numerical relationships to solve problems efficiently. Students should also develop fluency in the use of simple algebraic skills in a variety of contexts. They should learn the language of simple probability and begin to solve probability problems.

Learning outcomes

These learning outcomes set out a programme of study in mathematics for Year 7.
During the year, every student will:

7.1a: Compare and order positive and negative numbers

7.1b: Recognize and use powers and roots (up to 3)

7.1c: Determine the value of each digit in any number

7.1d: Use estimates to check answers

7.1e: Compare and simplify fractions

7.1f: Write one number as a fraction of another and find a fraction of an amount

7.1g: Recognize and use the equivalence of fractions, decimals and percentages

7.1h: Convert between fractions, decimals and percentages

7.1i: Compare and order fractions, decimals and percentages

7.1j: Use mental methods to find a simple percentage of an amount

7.1k: Round any decimal to one decimal place

7.2a: Use written and mental methods to add and subtract positive and negative numbers

7.2b: Add and subtract mixed numbers

7.2c: Add and subtract decimals

7.2d: Multiply proper fractions and mixed numbers by positive whole numbers and by fractions

7.2e: Use division to write a fraction as a decimal

7.2f: Divide decimals by whole numbers, and solve problems involving decimals

7.2g: Find lists of factors, multiples, primes and factor pairs, and use them to find the highest common factor and lowest common multiple of a pair of numbers

7.2h: Multiply and divide positive and negative numbers

7.2i: Divide integers and fractions by fractions

7.3a: Solve problems involving metric conversions

7.3b: Calculate the perimeter of regular and irregular polygons

7.3c: Calculate the areas of squares, rectangles, compound shapes made from rectangles

7.3d: Solve perimeter and area problems

7.3e: Express two quantities as a ratio and write ratios in their simplest form

7.3f: Recognize the relationship between ratio and proportion

7.3g: Solve simple proportional reasoning problems

7.4a: Identify and use line and rotational symmetry in triangles and quadrilaterals

7.4b: Recognize and use properties of triangles

7.4c: Make accurate drawings, including scale drawings

7.4d: Solve problems involving angles at a point

7.4e: Understand the meaning of similarity and congruency, and identify similar and congruent shapes

7.4f: Use positive and negative coordinates

7.4g: Find the coordinates of the midpoint of a line segment

7.4h: Use reflections, rotations, translations and combinations of transformations of 2D shapes

7.4i: Enlarge 2D shapes by a given scale factor

7.5a: Write simple expressions and formulae using the four operations

7.5b: Collect like terms in simple expressions

7.5c: Substitute positive numbers into simple expressions and formulae

7.5d: Multiply a single positive term over a bracket

7.5e: Generate and continue sequences

7.5f: Work out the *n*th term of an arithmetic sequence

7.5g: Find the term-to-term rule of a geometric sequence and use it to continue a sequence

7.5h: Draw straight-line graphs of the form $y = mx + c$ and solve problems involving straight-line graphs

7.6a: Find the mode, median and range from a list or table

7.6b: Calculate and interpret the mean from a list

7.6c: Solve problems involving averages and range, and use averages and range to compare sets of data

7.6d: Identify and group discrete and continuous data

7.6e: Design, use and interpret various statistical tables, graphs and diagrams

7.6f: Use and interpret probability scales

7.6g: Calculate and compare probabilities

7.6h: Calculate the probability of an event not happening

Assessment criteria

The assessment criteria allow the teacher to assess the level of achievement of each student.

7.1a: *Compare and order positive and negative numbers*

Developing: The student can, with support, compare and order positive and negative numbers.

Secure: The student can compare and order positive and negative numbers.

Extending: The student can compare and order positive and negative numbers and solve related problems.

7.1b: *Recognize and use powers and roots (up to 3)*

Developing: The student can, with support, recognize and use powers and roots (up to 3).

Secure: The student can recognize and use powers and roots (up to 3).

Extending: The student can recognize and use powers and roots (up to 3) and solve related problems.

7.1c: *Determine the value of each digit in any number*

Developing: The student can, with support, determine the value of each digit in any number.

Secure: The student can determine the value of each digit in any number.

Extending: The student can determine the value of each digit in any number and solve related problems.

7.1d: *Use estimates to check answers*

Developing: The student can, with support, use simple estimates to check answers.

Secure: The student can use simple estimates to check answers.

Extending: The student can use more complex estimates to check answers.

7.1e: *Compare and simplify fractions*

Developing: The student can, with support, compare and simplify fractions.

Secure: The student can compare and simplify fractions.

Extending: The student can compare and simplify fractions and solve related problems.

7.1f: *Write one number as a fraction of another and find a fraction of an amount*

Developing: The student can, with support, write one number as a fraction of another and find a fraction of an amount.

Secure: The student can write one number as a fraction of another and find a fraction of an amount.

Extending: The student can write one number as a fraction of another and find a fraction of an amount and solve related problems.

7.1g: *Recognize and use the equivalence of fractions, decimals, and percentages*

Developing: The student can, with support, recognize and use the equivalence of fractions, decimals, and percentages.

Secure: The student can recognize and use the equivalence of fractions, decimals, and percentages.

Extending: The student can recognize and use the equivalence of fractions, decimals, and percentages and solve related problems.

7.1h: *Convert between fractions, decimals, and percentages*

Developing: The student can, with support, convert between fractions, decimals, and percentages.

Secure: The student can convert between fractions, decimals, and percentages.

Extending: The student can convert between fractions, decimals, and percentages and solve related problems.

7.1i: *Compare and order fractions, decimals, and percentages*

Developing: The student can, with support, compare and order fractions, decimals, and percentages.

Secure: The student can compare and order fractions, decimals, and percentages.

Extending: The student can compare and order fractions, decimals, and percentages and solve related problems.

7.1j: *Use mental methods to find a simple percentage of an amount*

Developing: The student can, with support, use mental methods to a find simple percentage of an amount.

Secure: The student can use mental methods to a find simple percentage of an amount.

Extending: The student can use mental methods to a find simple percentage of an amount and solve related problems.

7.1k: *Round any decimal to one decimal place*

Developing: The student can, with support, round any decimal to one decimal place.

Secure: The student can round any decimal to one decimal place.

Extending: The student applies their understanding of rounding to practical contexts and can reason about their thinking.

7.2a: *Use written and mental methods to add and subtract positive and negative numbers*

Developing: The student can, with support, use written and mental methods to add and subtract positive and negative numbers.

Secure: The student can use written and mental methods to add and subtract positive and negative numbers.

Extending: The student can use written and mental methods to add and subtract positive and negative numbers and solve related problems.

7.2b: *Add and subtract mixed numbers*

Developing: The student can, with support, add and subtract mixed numbers.

Secure: The student can add and subtract mixed numbers.

Extending: The student can add and subtract mixed numbers and solve related problems.

7.2c: *Add and subtract decimals*

Developing: The student can, with support, add and subtract decimals to three decimal places.

Secure: The student can add and subtract decimals.

Extending: The student can add and subtract decimals and solve related problems.

7.2d: *Multiply proper fractions and mixed numbers by positive whole numbers and by fractions*

Developing: The student can, with support, multiply proper fractions and mixed numbers by positive whole numbers and by fractions.

Secure: The student can multiply proper fractions and mixed numbers by positive whole numbers and by fractions.

Extending: The student can multiply proper fractions and mixed numbers by positive whole numbers and by fractions and solve related problems.

7.2e: *Use division to write a fraction as a decimal*

Developing: The student can, with support, use division to write a fraction as a decimal.

Secure: The student can use division to write a fraction as a decimal.

Extending: The student can use division to write a fraction as a decimal and solve related problems.

7.2f: *Divide decimals by whole numbers, and solve problems involving decimals*

Developing: The student can, with support, divide decimals by whole numbers, and solve problems involving decimals.

Secure: The student can divide decimals by whole numbers and solve problems involving decimals.

Extending: The student can divide decimals by whole numbers, solve problems involving decimals and clearly explain their reasoning.

7.2g: *Find lists of factors, multiples, primes, and factor pairs and use them to find the highest common factor and lowest common multiple of a pair of numbers*

Developing: The student can, with support, find lists of factors, multiples, primes, and factor pairs and use them to find the highest common factor and lowest common multiple of a pair of numbers.

Secure: The student can find lists of factors, multiples, primes, and factor pairs and use them to find the highest common factor and lowest common multiple of a pair of numbers.

Extending: The student can find lists of factors, multiples, primes, and factor pairs and use them to find the highest common factor and lowest common multiple of a pair of numbers and solve related problems.

7.2h: *Multiply and divide positive and negative numbers*

Developing: The student can, with support, multiply and divide positive and negative numbers.

Secure: The student can multiply and divide positive and negative numbers.

Extending: The student can multiply and divide positive and negative numbers and solve related problems.

7.2i: *Divide integers and fractions by fractions*

Developing: The student can, with support, divide integers and fractions by fractions.

Secure: The student can divide integers and fractions by fractions.

Extending: The student can divide integers and fractions by fractions and solve related problems.

7.3a: *Solve problems involving metric conversions*

Developing: The student can, with support, solve simple problems involving metric conversions.

Secure: The student can solve simple problems involving metric conversions.

Extending: The student can solve more complex problems involving metric conversions.

7.3b: *Calculate the perimeter of regular and irregular polygons*

Developing: The student can, with support, calculate the perimeter of regular and irregular polygons.

Secure: The student can calculate the perimeter of regular and irregular polygons.

Extending: The student can calculate the perimeter of regular and irregular polygons and solve related problems.

7.3c: *Calculate the areas of squares, rectangles, compound shapes made from rectangles*

Developing: The student can, with support, calculate the areas of squares, rectangles, compound shapes made from rectangles.

Secure: The student can calculate the areas of squares, rectangles, compound shapes made from rectangles.

Extending: The student can calculate the areas of squares, rectangles, compound shapes made from rectangles and solve related problems.

7.3d: *Solve perimeter and area problems*

Developing: The student can, with support, solve simple perimeter and area problems.

Secure: The student can solve perimeter and area problems.

Extending: The student can solve perimeter and area problems in a variety of contexts.

7.3e: *Express two quantities as a ratio and write rations in their simplest form*

Developing: The student can, with support, express two quantities as a ratio and write ratios in their simplest form.

Secure: The student can express two quantities as a ratio and write ratios in their simplest form.

Extending: The student can express two or three quantities as a ratio and write ratios in their simplest form.

7.3f: *Recognize the relationship between ratio and proportion*

Developing: The student can, with support, recognize the relationship between ratio and proportion.

Secure: The student can recognize the relationship between ratio and proportion.

Extending: The student can recognize the relationship between ratio and proportion and solve related problems.

7.3g: *Solve simple proportional reasoning problems*

Developing: The student can, with support, solve proportional reasoning problems.

Secure: The student can solve proportional reasoning problems.

Extending: The student can solve proportional reasoning problems and clearly explain their reasoning.

7.4a: *Identify and use line and rotational symmetry in triangles and quadrilaterals*

Developing: The student can, with support, identify and use line and rotational symmetry in triangles and quadrilaterals.

Secure: The student can identify and use line and rotational symmetry in triangles and quadrilaterals.

Extending: The student can identify and use line and rotational symmetry in triangles and quadrilaterals and solve related problems.

7.4b: *Recognize and use properties of triangles*

Developing: The student can, with support, recognize and use properties of triangles.

Secure: The student can recognize and use properties of triangles.

Extending: The student can recognize and use properties of triangles to solve related problems.

7.4c: *Make accurate drawings, including scale drawings*

Developing: The student can, with support, make accurate drawings, including scale drawings.

Secure: The student can make accurate drawings, including scale drawings.

Extending: The student can make accurate drawings, including scale drawings, and solve related problems.

7.4d: *Solve problems involving angles at a point*

Developing: The student can, with support, solve simple problems involving angles at a point.

Secure: The student can solve problems involving angles at a point.

Extending: The student can solve more complex problems involving angles at a point.

7.4e: *Understand the meaning of similarity and congruency, and identify similar and congruent shapes*

Developing: The student can, with support, understand the meaning of similarity and congruency, and identify similar and congruent shapes.

Secure: The student can understand the meaning of similarity and congruency, and identify similar and congruent shapes.

Extending: The student can understand the meaning of similarity and congruency, and identify similar and congruent shapes and solve related problems.

7.4f: *Use positive and negative coordinates*

Developing: The student can, with support, use positive and negative coordinates.

Secure: The student can use positive and negative coordinates.

Extending: The student can use positive and negative coordinates and solve related problems.

7.4g: *Find the coordinates of the midpoint of a line segment*

Developing: The student can, with support, find the coordinates of the midpoint of a line segment.

Secure: The student can find the coordinates of the midpoint of a line segment.

Extending: The student can find the coordinates of the midpoint of a line segment and solve related problems.

7.4h: *Use reflections, rotations, translations, and combinations of transformations of 2D shapes*

Developing: The student can, with support, use reflections, rotations, translations, and combinations of transformations of 2D shapes.

Secure: The student can use reflections, rotations, translations, and combinations of transformations of 2D shapes.

Extending: The student can use reflections, rotations, translations, and combinations of transformations of 2D shapes and solve related problems.

7.4i: *Enlarge 2D shapes by a given scale factor*

Developing: The student can, with support, enlarge 2D shapes by a given scale factor.

Secure: The student can enlarge 2D shapes by a given scale factor.

Extending: The student can enlarge 2D shapes by a given scale factor through a given point.

7.5a: *Write simple expressions and formulae using the four operations*

Developing: The student can, with support, write simple expressions and formulae using the four operations.

Secure: The student can write simple expressions and formulae using the four operations.

Extending: The student can write simple expressions and formulae using the four operations and solve related problems.

7.5b: *Collect like terms in simple expressions*

Developing: The student can, with support, collect like terms in simple expressions.

Secure: The student can collect like terms in simple expressions.

Extending: The student can collect like terms in simple expressions and solve related problems.

7.5c: *Substitute positive numbers into simple expressions and formulae*

Developing: The student can, with support, substitute positive numbers into simple expressions and formulae.

Secure: The student can substitute positive numbers into simple expressions and formulae.

Extending: The student can substitute positive and negative numbers into simple expressions and formulae.

7.5d: *Multiply a single positive term over a bracket*

Developing: The student can, with support, multiply a single positive term over a bracket.

Secure: The student can multiply a single positive term over a bracket.

Extending: The student can multiply a single positive term over a bracket and can solve related problems.

7.5e: *Generate and continue sequences*

Developing: The student can, with support, generate and continue sequences.

Secure: The student can generate and continue sequences.

Extending: The student can generate and continue sequences and solve related problems.

7.5f: *Work out the nth term of an arithmetic sequence*

Developing: The student can, with support, work out the *n*th term of an arithmetic sequence.

Secure: The student can work out the *n*th term of an arithmetic sequence.

Extending: The student can work out the *n*th term of an arithmetic sequence and solve related problems.

7.5g: *Find the term-to-term rule of a geometric sequence and use it to continue a sequence*

Developing: The student can, with support, find the term-to-term rule of a geometric sequence and use it to continue a sequence.

Secure: The student can find the term-to-term rule of a geometric sequence and use it to continue a sequence.

Extending: The student can find the term-to-term rule of a geometric sequence and use it to continue a sequence and solve related problems.

7.5h: *Draw straight-line graphs of the form $y = mx + c$ and solve problems involving straight-line graphs*

Developing: The student can, with support, draw straight-line graphs of the form $y = mx + c$ and solve problems involving straight-line graphs.

Secure: The student can draw straight-line graphs of the form $y = mx + c$ and solve problems involving straight-line graphs.

Extending: The student can draw straight-line graphs of the form $y = mx + c$ and solve problems involving straight-line graphs and can clearly explain their reasoning.

7.6a: *Find the mode, median and range from a list or table*

Developing: The student can, with support, find the mode, median and range from a list or table.

Secure: The student can find the mode, median and range from a list or table.

Extending: The student can find the mode, median and range from a list or table and solve related problems.

7.6b: *Calculate and interpret the mean from a list*

Developing: The student can, with support, calculate and interpret the mean from a list.

Secure: The student can calculate and interpret the mean from a list.

Extending: The student can calculate and interpret the mean from a list and solve related problems.

7.6c: *Solve problems involving averages and range, and use averages and range to compare sets of data*

Developing: The student can, with support, solve simple problems involving averages and range and use averages and range to compare sets of data.

Secure: The student can solve problems involving averages and range and use averages and range to compare sets of data.

Extending: The student can solve more complex problems involving averages and range and use averages and range to compare sets of data.

7.6d: *Identify and group discrete and continuous data*

Developing: The student can, with support, identify and group discrete and continuous data.

Secure: The student can identify and group discrete and continuous data.

Extending: The student can identify and group discrete and continuous data and solve related problems.

7.6e: *Design, use and interpret various statistical tables, graphs, and diagrams*

Developing: The student can, with support, design, use and interpret various statistical tables, graphs, and diagrams.

Secure: The student can design, use and interpret various statistical tables, graphs, and diagrams.

Extending: The student can design, use and interpret various statistical tables, graphs, and diagrams and solve related problems.

7.6f: *Use and interpret probability scales*

Developing: The student can, with support, use and interpret probability scales.

Secure: The student can use and interpret probability scales.

Extending: The student can use and interpret probability scales and solve related problems.

7.6g: *Calculate and compare probabilities*

Developing: The student can. with support, calculate and compare probabilities.

Secure: The student can calculate and compare probabilities.

Extending: The student can calculate and compare probabilities and solve releated problems.

7.6h: *Calculate the probability of an event not happening*

Developing: The student can, with support, calculate the probability of an event not happening.

Secure: The student can calculate the probability of an event not happening.

Extending: The student can calculate the probability of an event not happening and solve related problems.

YEAR **EIGHT**

Introduction

In Year 8, students will consolidate and extend the mathematical skills learned in Year 7. They should learn to reason and solve problems involving various 2D and 3D shapes. Students should also begin to develop more advanced algebraic skills and use them in a variety of contexts. They should consolidate and develop their understanding of probability from Year 7 to solve more complex probability problems.

Learning outcomes

These learning outcomes set out a programme of study in mathematics for Year 8.
During the year, every student will:

8.1a: Round any decimal to given number of decimal places
8.1b: Find the upper and lower bounds of a given quantity
8.1c: Solve problems involving decimals
8.1d: Calculate one number as a percentage of another
8.1e: Calculate percentage increase and decrease
8.1f: Find a percentage of an amount using a multiplier or by using a unitary method
8.1g: Perform calculations using simple interest
8.1h: Solve real-life problems involving fractions, decimals and percentages
8.2a: Multiply fractions by integers and fractions
8.2b: Recognize and find the reciprocal of a fraction
8.2c: Write a recurring decimal as a fraction
8.2d: Write a fraction as a recurring decimal
8.2e: Multiply and divide any number by 0.1, 0.01 or 0.001
8.2f: Use written methods to multiply and divide decimals
8.3a: Calculate the areas of triangles, trapezia and parallelograms
8.3b: Calculate the area of compound shapes made from rectangles and triangles
8.3c: Calculate the surface area and volume of cubes and cuboid
8.3d: Simplify ratios involving decimals
8.3e: Simplify ratios involving different units
8.3f: Use ratio to share a quantity into three parts
8.3g: Solve problems involving ratio
8.3h: Solve problems involving speed, distance, time
8.4a: Identify and use the properties of quadrilaterals
8.4b: Identify and use alternate and corresponding angles to solve problems with intersecting and parallel lines
8.4c: Identify and calculate interior and exterior angles of polygons
8.4d: Recognize and use the conditions of similarity
8.4e: Find the bearing of one point from another
8.4f: Solve simple problems involving bearings
8.4g: Recognize and use the relationship between lengths in similar figures
8.4h: Recognize and use the relationship between areas in similar figures
8.4i: Recognize and use the relationship between volumes in similar figures
8.5a: Write and solve one-step and two-step equations including those with brackets
8.5b: Solve equations with letters on both sides
8.5c: Simplify expressions involving powers and brackets
8.5d: Factorize a single term out of an expression

8.5e: Substitute positive and negative numbers into simple expressions and formulae
8.5f: Construct and solve equations
8.5g: Simplify algebraic fractions with numeric denominators
8.5h: Solve equations involving algebraic fractions with numeric denominators
8.5i: Perform a simple algebraic proof
8.5j: Recognize and graph direct proportion
8.5k: Draw and use distance-time graphs
8.5l: Interpret non-linear and real-life graphs
8.5m: Recognize when and why graphs are misleading
8.5n: Calculate the gradient and y-intercept of a straight-line graph and find the equation of a straight line from its graph
8.5o: Recognize what makes two lines parallel or perpendicular
8.5p: Calculate the gradient of a perpendicular line
8.5q: Find the equation of a perpendicular line
8.5r: Solve problems involving intersecting straight line
8.5s: Identify and continue a quadratic sequence
8.5t: Find an expression for the nth term of a quadratic sequence
8.6a: Calculate and interpret the mean from a table
8.6a: Calculate and interpret the mean from a table
8.6b: Identify the most appropriate average to use in a given situation
8.6c: Design and use two-way tables and tables for grouped data
8.6d: Draw and interpret a histogram
8.6e: Draw and interpret a box plot
8.6f: Draw and interpret a cumulative frequency curve
8.6g: Find the quartiles and interquartile range
8.6h: Perform simple experiments and accurately record the results
8.6i: Use experimental probability to estimate probabilities
8.6j: Calculate and use relative frequency
8.6k: Calculate expected probabilities
8.6l: Find a probability from a Venn diagram
8.6m: Find the probability of an independent event

Assessment criteria

The assessment criteria allow the teacher to assess the level of achievement of each student.

8.1a: *Round any decimal to given number of decimal places*

Developing: The student can, with support, round any decimal to given number of decimal places.

Secure: The student can round any decimal to given number of decimal places.

Extending: The student can round any decimal to given number of decimal places and solve related problems.

8.1b: *Find the upper and lower bounds of a given quantity*

Developing: The student can, with support, find the upper and lower bounds of a given quantity.

Secure: The student can find the upper and lower bounds of a given quantity.

Extending: The student can find the upper and lower bounds of a given quantity and solve related problems.

8.1c: *Solve problems involving decimals*

Developing: The student can, with support, solve problems involving decimals.

Secure: The student can solve problems involving decimals.

Extending: The student can use their understanding of decimals to solve problems involving decimals and clearly explain their reasoning.

8.1d: *Calculate one number as a percentage of another*

Developing: The student can, with support, calculate one number as a percentage of another.

Secure: The student can calculate one number as a percentage of another.

Extending: The student can calculate one number as a percentage of another and solve related problems.

8.1e: *Calculate percentage increase and decrease*

Developing: The student can, with support, calculate percentage increase and decrease.

Secure: The student can calculate percentage increase and decrease.

Extending: The student can calculate percentage increase and decrease and solve related problems.

8.1f: *Find a percentage of an amount using a multiplier or by using a unitary method*

Developing: The student can, with support, find a percentage of an amount using a multiplier or by using a unitary method.

Secure: The student can find a percentage of an amount using a multiplier or by using a unitary method.

Extending: The student can find a percentage of an amount using a multiplier or by using a unitary method and solve related problems.

8.1g: *Perform calculations using simple interest*

Developing: The student can, with support, perform calculations using simple interest.

Secure: The student can perform calculations using simple interest.

Extending: The student can perform calculations using simple interest and solve related problems.

8.1h: *Solve real-life problems involving fractions, decimals and percentages*

Developing: The student can, with support, solve real-life problems involving fractions, decimals and percentages.

Secure: The student can solve real-life problems involving fractions, decimals and percentages.

Extending: The student can solve real-life problems involving fractions, decimals and percentages and solve related problems.

8.2a: *Multiply fractions by integers and fractions*

Developing: The student can, with support, multiply fractions by integers and fractions.

Secure: The student can multiply fractions by integers and fractions.

Extending: The student can multiply fractions by integers and fractions and solve related problems.

8.2b: *Recognize and find the reciprocal of a fraction*

Developing: The student can, with support, recognize and find the reciprocal of a fraction.

Secure: The student can recognize and find the reciprocal of a fraction.

Extending: The student can recognize and find the reciprocal of a fraction and solve related problems.

8.2c: *Write a recurring decimal as a fraction*

Developing: The student can, with support, *write a recurring decimal as a fraction.*

Secure: The student can *write a recurring decimal as a fraction.*

Extending: The student can *write a recurring decimal as a fraction and solve related problems.*

8.2d: *Write a fraction as a recurring decimal*

Developing: The student can, with support, *write a fraction as a recurring decimal.*

Secure: The student can *write a fraction as a recurring decimal.*

Extending: The student can *write a fraction as a recurring decimal and solve related problems.*

8.2e: *Multiply and divide any number by 0.1, 0.01 or 0.001*

Developing: The student can, with support, multiply and divide any number by 0.1 or 0.01.

Secure: The student can multiply and divide any number by 0.1, 0.01 or 0.001.

Extending: The student can multiply and divide any number by 0.1, 0.01 or 0.001 and solve related problems.

8.2f: *Use written methods to multiply and divide decimals*

Developing: The student can, with support, use written methods to multiply and divide decimals.

Secure: The student can use written methods to multiply and divide decimals.

Extending: The student can use written methods to multiply and divide decimals and solve related problems.

8.3a: *Calculate the areas of triangles, trapezia, and parallelograms*

Developing: The student can, with support, calculate the areas of triangles, trapezia, and parallelograms.

Secure: The student can calculate the areas of triangles, trapezia, and parallelograms.

Extending: The student can calculate the areas of triangles, trapezia, and parallelograms and solve related problems.

8.3b: *Calculate the area of compound shapes made from rectangles and triangles*

Developing: The student can, with support, calculate the areas of triangles, trapezia, and parallelograms.

Secure: The student can calculate the areas of triangles, trapezia, and parallelograms.

Extending: The student can calculate the areas of triangles, trapezia, and parallelograms and solve related problems.

8.3c: *Calculate the surface area and volume of cubes and cuboids*

Developing: The student can, with support, calculate the surface area and volume of cubes and cuboids.

Secure: The student can calculate the surface area and volume of cubes and cuboids.

Extending: The student can calculate the surface area and volume of cubes and cuboids and solve related problems.

8.3d: *Simplify ratios involving decimals*

Developing: The student can, with support, simplify ratios involving decimals.

Secure: The student can simplify ratios involving decimals.

Extending: The student can simplify ratios involving decimals and solve related problems.

8.3e: *Simplify ratios involving different units*

Developing: The student can, with support, simplify ratios involving different units.

Secure: The student can simplify ratios involving different units.

Extending: The student can simplify ratios involving different units and solve related problems.

8.3f: *Use ratio to share a quantity into three parts*

Developing: The student can, with support, use ratio to share a quantity into three parts.

Secure: The student can use ratio to share a quantity into three parts.

Extending: The student can use their understanding of ratio to share a quantity into three parts and solve related problems.

8.3g: *Solve problems involving ratio*

Developing: The student can, with support, *solve problems involving ratio.*

Secure: The student can *solve problems involving ratio.*

Extending: The student can *solve problems involving ratio and solve related problems.*

8.3h: *Solve problems involving speed, distance, time*

Developing: The student can, with support, *solve problems involving speed, distance, time.*

Secure: The student can *solve problems involving speed, distance, time.*

Extending: The student can *solve problems involving speed, distance, time and solve related problems.*

8.4a: *Identify and use the properties of quadrilaterals*

Developing: The student can, with support, identify and use the properties of quadrilaterals.

Secure: The student can identify and use the properties of quadrilaterals.

Extending: The student can identify and use the properties of quadrilaterals and solve related problems.

8.4b: *Identify and use alternate and corresponding angles to solve problems with intersecting and parallel lines*

Developing: The student can, with support, identify and use alternate and corresponding angles to solve problems with intersecting and parallel lines.

Secure: The student can identify and use alternate and corresponding angles to solve problems with intersecting and parallel lines.

Extending: The student can identify and use alternate and corresponding angles to solve problems with intersecting and parallel lines and can clearly explain their reasoning.

8.4c: *Identify and calculate interior and exterior angles of polygons*

Developing: The student can, with support, identify and calculate interior and exterior angles of polygons.

Secure: The student can identify and calculate interior and exterior angles of polygons.

Extending: The student can identify and calculate interior and exterior angles of polygons and solve related problems.

8.4d: *Recognize and use the conditions of similarity*

Developing: The student can, with support, r*ecognize and use the conditions of similarity.*

Secure: The student can r*ecognize and use the conditions of similarity.*

Extending: The student can r*ecognize and use the conditions of similarity and solve related problems.*

8.4e: *Find the bearing of one point from another*

Developing: The student can, with support, *find the bearing of one point from another.*

Secure: The student can *find the bearing of one point from another.*

Extending: The student can *find the bearing of one point from another and solve related problems.*

8.4f: *Solve simple problems involving bearings*

Developing: The student can, with support, *solve simple problems involving bearings.*

Secure: The student can *solve simple problems involving bearings.*

Extending: The student can *solve simple problems involving bearings and solve related problems.*

8.4g: *Recognize and use the relationship between lengths in similar figures*

Developing: The student can, with support, r*ecognize and use the relationship between lengths in similar figures.*

Secure: The student can r*ecognize and use the relationship between lengths in similar figures.*

Extending: The student can r*ecognize and use the relationship between lengths in similar figures and solve related problems.*

8.4h: *Recognize and use the relationship between areas in similar figures*

Developing: The student can, with support, r*ecognize and use the relationship between areas in similar figures.*

Secure: The student can r*ecognize and use the relationship between areas in similar figures.*

Extending: The student can r*ecognize and use the relationship between areas in similar figures and solve related problems.*

8.4i: *Recognize and use the relationship between volumes in similar figures*

Developing: The student can, with support, r*ecognize and use the relationship between volumes in similar figures.*

Secure: The student can r*ecognize and use the relationship between volumes in similar figures.*

Extending: The student can r*ecognize and use the relationship between volumes in similar figures and solve related problems.*

8.5a: *Write and solve one-step and two-step equations, including those with brackets*

Developing: The student can, with support, write and solve one-step equations, including those with brackets.

Secure: The student can write and solve one-step and two-step equations, including those with brackets.

Extending: The student can write and solve one-step and two-step equations, including those with brackets, and can solve related problems.

8.5b: *Solve equations with letters on both sides*

Developing: The student can, with support, solve equations with letters on both sides.

Secure: The student can solve equations with letters on both sides.

Extending: The student can solve equations with letters on both sides and solve related problems.

8.5c: *Simplify expressions involving powers and brackets*

Developing: The student can, with support, simplify expressions involving powers and brackets.

Secure: The student can simplify expressions involving powers and brackets.

Extending: The student can simplify expressions involving powers and brackets and solve related problems.

8.5d: *Factorize a single term out of an expression*

Developing: The student can, with support, factorize a single term out of an expression.

Secure: The student can factorize a single term out of an expression.

Extending: The student can factorize one or two terms out of an expression.

8.5e: *Substitute positive and negative numbers into simple expressions and formulae*

Developing: The student can, with support, substitute positive and negative numbers into simple expressions and formulae.

Secure: The student can substitute positive and negative numbers into simple expressions and formulae.

Extending: The student can substitute positive and negative numbers into simple expressions and formulae and solve related problems.

8.5f: *Construct and solve equations*

Developing: The student can, with support, construct and solve equations.

Secure: The student can construct and solve equations.

Extending: The student can construct and solve equations in the context of a problem.

8.5g: *Simplify algebraic fractions with numeric denominators*

Developing: The student can, with support, s*implify algebraic fractions with numeric denominators.*

Secure: The student can s*implify algebraic fractions with numeric denominators.*

Extending: The student can s*implify algebraic fractions with numeric denominators and solve related problems.*

8.5h: *Solve equations involving algebraic fractions with numeric denominators*

Developing: The student can, with support, s*olve equations involving algebraic fractions with numeric denominators.*

Secure: The student can s*olve equations involving algebraic fractions with numeric denominators.*

Extending: The student can s*olve equations involving algebraic fractions with numeric denominators and solve related problems.*

8.5i: *Perform a simple algebraic proof*

Developing: The student can, with support, p*erform a simple algebraic proof.*

Secure: The student can p*erform a simple algebraic proof.*

Extending: The student can p*erform a simple algebraic proof and solve related problems.*

8.5j: *Recognize and graph direct proportion*

Developing: The student can, with support, recognize and graph direct proportion.

Secure: The student can recognize and graph direct proportion.

Extending: The student can recognize and graph direct proportion and solve related problems.

8.5k: *Draw and use distance-time graphs*

Developing: The student can, with support, draw and use distance-time graphs.

Secure: The student can draw and use distance-time graphs.

Extending: The student can draw and use distance-time graphs and solve related problems.

8.5l: *Interpret non-linear and real-life graphs*

Developing: The student can, with support, interpret non-linear and real-life graphs.

Secure: The student can interpret non-linear and real-life graphs.

Extending: The student can interpret non-linear and real-life graphs and solve related problems.

8.5m: *Recognize when and why graphs are misleading*

Developing: The student can, with support, recognize when and why graphs are misleading.

Secure: The student can recognize when and why graphs are misleading.

Extending: The student can recognize when and why graphs are misleading and solve related problems.

8.5n: *Calculate the gradient and y-intercept of a straight-line graph and find the equation of a straight line from its graph*

Developing: The student can, with support, calculate the gradient and *y*-intercept of a straight-line graph and find the equation of a straight line from its graph.

Secure: The student can calculate the gradient and *y*-intercept of a straight-line graph and find the equation of a straight line from its graph.

Extending: The student can calculate the gradient and *y*-intercept of a straight-line graph and find the equation of a straight line from its graph and solve related problems.

8.5o: *Recognize what makes two lines parallel or perpendicular*

Developing: The student can, with support, r*ecognize what makes two lines parallel or perpendicular.*

Secure: The student can r*ecognize what makes two lines parallel or perpendicular.*

Extending: The student can r*ecognize what makes two lines parallel or perpendicular and solve related problems.*

8.5p: *Calculate the gradient of a perpendicular line*

Developing: The student can, with support, *calculate the gradient of a perpendicular line.*

Secure: The student can *calculate the gradient of a perpendicular line.*

Extending: The student can *calculate the gradient of a perpendicular line and solve related problems.*

8.5q: *Find the equation of a perpendicular line*

Developing: The student can, with support, *find the equation of a perpendicular line.*

Secure: The student can *find the equation of a perpendicular line.*

Extending: The student can *find the equation of a perpendicular line and solve related problems.*

8.5r: *Solve problems involving intersecting straight line*

Developing: The student can, with support, *solve problems involving intersecting straight line.*

Secure: The student can *solve problems involving intersecting straight line.*

Extending: The student can *solve problems involving intersecting straight line and solve related problems.*

8.5s: *Identify and continue a quadratic sequence*

Developing: The student can, with support, i*dentify and continue a quadratic sequence.*

Secure: The student can i*dentify and continue a quadratic sequence.*

Extending: The student can i*dentify and continue a quadratic sequence and solve related problems.*

8.5t: *Find an expression for the nth term of a quadratic sequence*

Developing: The student can, with support, f*ind an expression for the nth term of a quadratic sequence.*

Secure: The student can f*ind an expression for the nth term of a quadratic sequence.*

Extending: The student can f*ind an expression for the nth term of a quadratic sequence* and solve related problems.

8.6a: *Calculate and interpret the mean from a table*

Developing: The student can, with support, calculate and interpret the mean from a table.

Secure: The student can calculate and interpret the mean from a table.

Extending: The student can calculate and interpret the mean from a table and solve related problems.

8.6b: *Identify the most appropriate average to use in a given situation*

Developing: The student can, with support, identify the most appropriate average to use in a given situation.

Secure: The student can identify the most appropriate average to use in a given situation.

Extending: The student can identify the most appropriate average to use in a given situation and solve related problems.

8.6c: *Design and use two-way tables and tables for grouped data*

Developing: The student can, with support, design and use two-way tables and tables for grouped data.

Secure: The student can design and use two-way tables and tables for grouped data.

Extending: The student can design and use two-way tables and tables for grouped data and solve related problems.

8.6d: *Draw and interpret a histogram*

Developing: The student can, with support, d*raw and interpret a histogram.*

Secure: The student can d*raw and interpret a histogram.*

Extending: The student can d*raw and interpret a histogram* and solve related problems.

8.6e: *Draw and interpret a box plot*

Developing: The student can, with support, d*raw and interpret a box plot.*

Secure: The student can d*raw and interpret a box plot.*

Extending: The student can d*raw and interpret a box plot* and solve related problems.

8.6f: *Draw and interpret a cumulative frequency curve*

Developing: The student can, with support, d*raw and interpret a cumulative frequency curve.*

Secure: The student can d*raw and interpret a cumulative frequency curve.*

Extending: The student can d*raw and interpret a cumulative frequency curve and solve related problems.*

8.6g: *Find the quartiles and interquartile range*

Developing: The student can, with support, *find the quartiles and interquartile range.*

Secure: The student can f*ind the quartiles and interquartile range.*

Extending: The student can f*ind the quartiles and interquartile range and solve related problems.*

8.6h: *Perform simple experiments and accurately record the results*

Developing: The student can, with support, perform simple experiments and accurately record the results.

Secure: The student can perform simple experiments and accurately record the results.

Extending: The student can perform simple experiments and can accurately record and analyse the results.

8.6i: *Use experimental probability to estimate probabilities*

Developing: The student can, with support, use experimental probability to estimate probabilities.

Secure: The student can use experimental probability to estimate probabilities.

Extending: The student can use experimental probability to estimate probabilities and solve related problems.

8.6j: *Calculate and use relative frequency*

Developing: The student can, with support, calculate and use relative frequency.

Secure: The student can calculate and use relative frequency.

Extending: The student can calculate and use relative frequency to solve related problems.

8.6k: *Calculate expected probabilities*

Developing: The student can, with support, calculate expected probabilities.

Secure: The student can calculate expected probabilities.

Extending: The student can calculate expected probabilities and solve related problems.

8.6l: *Find a probability from a Venn diagram*

Developing: The student can, with support, f*ind a probability from a Venn diagram.*

Secure: The student can f*ind a probability from a Venn diagram.*

Extending: The student can f*ind a probability from a Venn diagram* and solve related problems.

8.6m: *Find the probability of an independent event*

Developing: The student can, with support, f*ind the probability of an independent event.*

Secure: The student can f*ind the probability of an independent event.*

Extending: The student can f*ind the probability of an independent event* and solve related problems.

YEAR **NINE**

Introduction

In Year 9, students will consolidate and extend the mathematical skills learned in Year 8. They should learn to manipulate and perform calculations involving numbers written in standard form. They will learn how to solve problems involving circles, triangles and prisms including the use of use Pythagoras' theorem and the trigonometric ratios. Students should also continue to expand their understanding of algebra.

Learning outcomes

These learning outcomes set out a programme of study in mathematics for Year 9.
During the year, every student will:

9.1a: Round an integer to a given number of significant figures

9.1b: Solve problems involving upper and lower bounds

9.1d: Write, compare and order numbers using standard form

9.1d: Calculate with numbers written in standard form

9.1e: Calculate reverse percentages

9.1f: Perform calculations using compound interest

9.1g: Use set notation

9.1h: Use Venn diagrams to represent sets

9.2a: Use the index laws to simplify numerical expressions and perform calculations

9.2b: Write the prime factor decomposition of numbers and use the results to find the highest common factor and lowest common multiple of a pair of numbers

9.2c: Perform calculations involving surds

9.2d: Simplify expressions involving surds

9.2e: Rationalize the denominator

9.3a: Calculate the surface area and volume of prisms

9.3b: Calculate the circumference and area of a circle

9.3c: Solve problems involving circles and parts of circles

9.3d: Recognize direct proportion and set up equations that show direct proportion

9.3e: Recognize and use inverse proportion

9.3f: Solve problems involving rates of change and compound measures

9.3g: Find the surface area of some solids

9.3h: Find the volume of some solids

9.3i: Find the surface area of some compound solids

9.3j: Find the volume of some compound solids

9.4a: Identify whether a shape is a prism

9.4b: Construct triangles and nets of 3D solids using compasses and a ruler

9.4c: Construct a line bisector, perpendicular bisector and angle bisector using compasses and a ruler

9.4d: Draw a described loci

9.4e: Make scale drawings and use maps

9.4f: Use Pythagoras' theorem in right-angled triangles

9.5a: Solve problems involving arithmetic and geometric sequences

9.5b: Expand two or more pairs of brackets

9.5c: Substitute integers into expressions and formulae involving powers, roots and brackets

9.5d: Write expressions, equations and formulae involving more than one variable

9.5e: Factorize a quadratic where the coefficient of x^2 is 1

9.5f: Use the index laws to simplify algebraic expressions and perform calculations

9.5g: Simplify algebraic fractions with linear denominators

9.5h: Solve equations involving algebraic fractions with linear denominators

9.5i: Solve linear inequalities

9.5j: Represent an inequality on a number line

9.5k: Represent inequalities on a graph

9.5l: Rearrange equations and change the subject of an equation

9.5m: Solve simultaneous equations

9.5n: Recognize and use direct and inverse variation

9.5o: Identify and use trigonometric ratios in right-angled triangles

9.5p: Find the distance between two points

9.5q: Solve problems involving straight lines

9.6a: Draw and interpret scatter graphs

9.6b: Describe correlation

9.6c: Draw and use a line of best fit

9.6d: Understand and use sample space diagrams

9.6e: Understand and use combined probabilities

9.6f: Recognize and use conditional probability

9.6g: Draw and use tree diagrams

Assessment criteria

The assessment criteria allow the teacher to assess the level of achievement of each student.

9.1a: *Round an integer to a given number of significant figures*

Developing:	The student can, with support, round an integer to a given number of significant figures.
Secure:	The student can round an integer to a given number of significant figures.
Extending:	The student can round an integer to a given number of significant figures and solve related problems.

9.1b: *Solve problems involving upper and lower bounds*

Developing:	The student can, with support, solve problems involving upper and lower bounds.
Secure:	The student can solve problems involving upper and lower bounds.
Extending:	The student can solve problems involving upper and lower bounds and solve related problems.

9.1c: *Write, compare, and order numbers using standard form*

Developing: The student can, with support, write, compare, and order numbers using standard form.

Secure: The student can write, compare, and order numbers using standard form.

Extending: The student can write, compare, and order numbers using standard form and solve related problems.

9.1d: *Calculate with numbers written in standard form*

Developing: The student can, with support, calculate with numbers written in standard form.

Secure: The student can calculate with numbers written in standard form.

Extending: The student can calculate with numbers written in standard form and solve related problems.

9.1e: *Calculate reverse percentages*

Developing: The student can, with support, calculate reverse percentages.

Secure: The student can calculate reverse percentages.

Extending: The student can calculate reverse percentages and solve related problems.

9.1f: *Perform calculations using compound interest*

Developing: The student can, with support, perform calculations using compound interest.

Secure: The student can perform calculations using compound interest.

Extending: The student can perform calculations using compound interest and solve related problems.

9.1g: *Use set notation*

Developing: The student can, with support, use set notation.

Secure: The student can use set notation.

Extending: The student can use set notation and solve related problems.

9.1h: *Use Venn diagrams to represent sets*

Developing: The student can, with support, use Venn diagrams to represent sets.

Secure: The student can use Venn diagrams to represent sets.

Extending: The student can use Venn diagrams to represent sets and solve related problems.

9.2a: *Use the index laws to simplify numerical expressions and perform calculations*

Developing: The student can, with support, u*se the index laws to simplify numerical expressions and perform calculations.*

Secure: The student can u*se the index laws to simplify numerical expressions and perform calculations.*

Extending: The student can u*se the index laws to simplify numerical expressions and perform calculations and solve related problems.*

9.2b: *Write the prime factor decomposition of numbers and use the results to find the highest common factor and lowest common multiple of a pair of numbers*

Developing: The student can, with support, write the prime factor decomposition of numbers and use the results to find the highest common factor and lowest common multiple of a pair of numbers.

Secure: The student can write the prime factor decomposition of numbers and use the results to find the highest common factor and lowest common multiple of a pair of numbers.

Extending: The student can write the prime factor decomposition of numbers and use the results to find the highest common factor and lowest common multiple of a pair of numbers and solve related problems.

9.2c: *Perform calculations involving surds*

Developing: The student can, with support, perform calculations involving surds.

Secure: The student can perform calculations involving surds.

Extending: The student can perform calculations involving surds and solve related problems.

9.2d: *Simplify expressions involving surds*

Developing: The student can, with support, simplify expressions involving surds.

Secure: The student can simplify expressions involving surds.

Extending: The student can simplify expressions involving surds and solve related problems.

9.2e: *Rationalize the denominator*

Developing: The student can, with support, rationalize the denominator.

Secure: The student can rationalize the denominator.

Extending: The student can rationalize the denominator and solve related problems.

9.3a: *Calculate the surface area and volume of prisms*

Developing: The student can, with support, calculate the surface area and volume of prisms.

Secure: The student can calculate the surface area and volume of prisms.

Extending: The student can calculate the surface area and volume of prisms and solve related problems.

9.3b: *Calculate the circumference and area of a circle*

Developing: The student can, with support, calculate the circumference and area of a circle.

Secure: The student can calculate the circumference and area of a circle.

Extending: The student can calculate the circumference and area of a circle and solve related problems.

9.3c: *Solve problems involving circles and parts of circles*

Developing: The student can, with support, solve problems involving circles and parts of circles.

Secure: The student can solve problems involving circles and parts of circles.

Extending: The student can solve problems involving circles and parts of circles and can clearly explain their reasoning.

9.3d: *Recognize direct proportion and set up equations that show direct proportion*

Developing: The student can, with support, recognize direct proportion and set up equations that show direct proportion.

Secure: The student can recognize direct proportion and set up equations that show direct proportion.

Extending: The student can recognize direct proportion and set up equations that show direct proportion and solve related problems.

9.2e: *Recognize and use inverse proportion*

Developing: The student can, with support, recognize and use inverse proportion.

Secure: The student can recognize and use inverse proportion.

Extending: The student can recognize and use inverse proportion and solve related problems.

9.3f: *Solve problems involving rates of change and compound measures*

Developing: The student can, with support, solve problems involving rates of change and compound measures.

Secure: The student can solve problems involving rates of change and compound measures.

Extending: The student can solve problems involving rates of change and compound measures and can clearly explain their reasoning.

9.3g: *Find the surface area of some solids*

Developing: The student can, with support, find the surface area of some solids.

Secure: The student can find the surface area of some solids.

Extending: The student can find the surface area of some solids and solve related problems.

9.3h: *Find the volume of some solids*

Developing: The student can, with support, find the volume of some solids.

Secure: The student can find the volume of some solids.

Extending: The student can find the volume of some solids and solve related problems.

9.3i: *Find the surface area of some compound solids*

Developing: The student can, with support, find the surface area of some compound solids.

Secure: The student can find the surface area of some compound solids.

Extending: The student can find the surface area of some compound solids and solve related problems.

9.3j: *Find the volume of some compound solids*

Developing: The student can, with support, find the volume of some compound solids.

Secure: The student can find the volume of some compound solids.

Extending: The student can find the volume of some compound solids and solve related problems.

9.4a: *Identify if a shape is a prism*

Developing: The student can, with support, identify if a shape is a prism.

Secure: The student can identify if a shape is a prism.

Extending: The student can identify if a shape is a prism and solve related problems.

9.4b: *Construct triangles and nets of 3D solids using compasses and a ruler*

Developing: The student can, with support, construct triangles and nets of 3D solids using compasses and a ruler.

Secure: The student can construct triangles and nets of 3D solids using compasses and a ruler.

Extending: The student can construct triangles and nets of 3D solids using compasses and a ruler and solve related problems.

9.4c: *Construct a line bisector, perpendicular bisector and angle bisector using compasses and a ruler*

Developing: The student can, with support, construct a line bisector, perpendicular bisector and angle bisector using compasses and a ruler.

Secure: The student can construct a line bisector, perpendicular bisector and angle bisector using compasses and a ruler.

Extending: The student can construct a line bisector, perpendicular bisector and angle bisector using compasses and a ruler and solve related problems.

9.4d: *Draw a described loci*

Developing: The student can, with support, draw a described loci.

Secure: The student can draw a described loci.

Extending: The student can draw a described loci and solve related problems.

9.4e: *Make scale drawings and use maps*

Developing: The student can, with support, make scale drawings and use maps.

Secure: The student can make scale drawings and use maps.

Extending: The student can make scale drawings and use maps and solve related problems.

9.4f: *Use Pythagoras' theorem in right-angled triangles*

Developing: The student can, with support, use Pythagoras' theorem in right-angled triangles.

Secure: The student can use Pythagoras' theorem in right-angled triangles.

Extending: The student can use Pythagoras' theorem in right-angled triangles and solve related problems.

9.5a: *Solve problems involving arithmetic and geometric sequences*

Developing: The student can, with support, solve problems involving arithmetic and geometric sequences.

Secure: The student can solve problems involving arithmetic and geometric sequences.

Extending: The student can solve problems involving arithmetic and geometric sequences and can clearly explain their reasoning.

9.5b: *Expand two or more pairs of brackets*

Developing: The student can, with support, expand two pairs of brackets.

Secure: The student can expand two or more pairs of brackets.

Extending: The student can expand two or more pairs of brackets and solve related problems.

9.5c: *Substitute integers into expressions and formulae involving powers, roots, and brackets*

Developing: The student can, with support, substitute integers into expressions and formulae involving powers, roots, and brackets.

Secure: The student can substitute integers into expressions and formulae involving powers, roots, and brackets.

Extending: The student can substitute integers into expressions and formulae involving powers, roots, and bracket and solve related problems.

9.5d: *Write expressions, equations and formulae involving more than one variable*

Developing: The student can, with support, write expressions, equations and formulae involving more than one variable.

Secure: The student can write expressions, equations and formulae involving more than one variable.

Extending: The student can write expressions, equations and formulae involving more than one variable and solve related problems.

9.5e: *Factorize a quadratic where the coefficient of x^ 2 is 1*

Developing: The student can, with support, factorize a quadratic where the coefficient of x^2 is 1.

Secure: The student can factorize a quadratic where the coefficient of x^2 is 1.

Extending: The student can factorize a quadratic where the coefficient of x^2 is 1 and solve related problems.

9.5f: *Use the index laws to simplify algebraic expressions and perform calculations*

Developing: The student can, with support, use the index laws to simplify algebraic expressions and perform calculations.

Secure: The student can use the index laws to simplify algebraic expressions and perform calculations.

Extending: The student can use the index laws to simplify algebraic expressions and perform calculations and solve related problems.

9.5g: *Simplify algebraic fractions with linear denominators*

Developing: The student can, with support, simplify algebraic fractions with linear denominators.

Secure: The student can simplify algebraic fractions with linear denominators.

Extending: The student can simplify algebraic fractions with linear denominators and solve related problems.

9.5h: *Solve equations involving algebraic fractions with linear denominators*

Developing: The student can, with support, solve equations involving algebraic fractions with linear denominators.

Secure: The student can solve equations involving algebraic fractions with linear denominators.

Extending: The student can solve equations involving algebraic fractions with linear denominators and solve related problems.

9.5i: *Solve linear inequalities*

Developing: The student can, with support, solve linear inequalities.

Secure: The student can solve linear inequalities.

Extending: The student can solve linear inequalities and related problems.

9.5j: *Represent an inequality on a number line*

Developing: The student can, with support, represent an inequality on a number line.

Secure: The student can represent an inequality on a number line.

Extending: The student can represent an inequality on a number line and solve related problems.

9.5k: *Represent inequalities on a graph*

Developing: The student can, with support, represent inequalities on a graph.

Secure: The student can represent inequalities on a graph.

Extending: The student can represent inequalities on a graph and solve related problems.

9.5l: *Rearrange equations and change the subject of an equation*

Developing: The student can, with support, rearrange equations and change the subject of an equation.

Secure: The student can rearrange equations and change the subject of an equation.

Extending: The student can rearrange equations and change the subject of an equation and solve related problems.

9.5m: *Solve simple simultaneous equations*

Developing: The student can, with support, solve simple simultaneous equations.

Secure: The student can solve simple simultaneous equations.

Extending: The student can solve simple simultaneous equations and solve related problems.

9.5n: *Recognize and use direct and inverse variation*

Developing: The student can, with support, recognize and use direct and inverse variation.

Secure: The student can recognize and use direct and inverse variation.

Extending: The student can recognize and use direct and inverse variation and solve related problems.

9.5o: *Identify and use trigonometric ratios in right-angled triangles*

Developing: The student can, with support, identify and use trigonometric ratios in right-angled triangles.

Secure: The student can identify and use trigonometric ratios in right-angled triangles.

Extending: The student can identify and use trigonometric ratios in right-angled triangles and solve related problems.

9.5p: *Find the distance between two points*

Developing: The student can, with support, find the distance between two points.

Secure: The student can find the distance between two points.

Extending: The student can find the distance between two points and solve related problems.

9.5q: *Solve problems involving straight lines*

Developing: The student can, with support, solve problems involving straight lines.

Secure: The student can solve problems involving straight lines.

Extending: The student can solve problems involving straight lines and related problems.

9.6a: *Draw and interpret scatter graphs*

Developing: The student can, with support, draw and interpret scatter graphs.

Secure: The student can draw and interpret scatter graphs.

Extending: The student can draw and interpret scatter graphs and solve related problems.

9.6b: *Describe correlation*

Developing: The student can, with support, describe correlation.

Secure: The student can describe correlation.

Extending: The student can describe correlation and related problems.

9.6c: *Draw and use a line of best fit*

Developing: The student can, with support, draw and use a line of best fit.

Secure: The student can draw and use a line of best fit.

Extending: The student can draw and use a line of best fit to solve related problems.

9.6d: *Understand and use sample space diagrams*

Developing: The student can, with support, understand and use sample space diagrams.

Secure: The student can understand and use sample space diagrams.

Extending: The student can understand and use sample space diagrams and solve related problems.

9.6e: *Understand and use combined probabilities*

Developing: The student can, with support, understand and use combined probabilities.

Secure: The student can understand and use combined probabilities.

Extending: The student can understand and use combined probabilities and solve related problems

9.6f: *Recognize and use conditional probability*

Developing: The student can, with support, recognize and use conditional probability.

Secure: The student can recognize and use conditional probability.

Extending: The student can recognize and use conditional probability and solve related problems.

9.6g: *Draw and use tree diagrams*

Developing: The student can, with support, draw and use tree diagrams.

Secure: The student can draw and use tree diagrams.

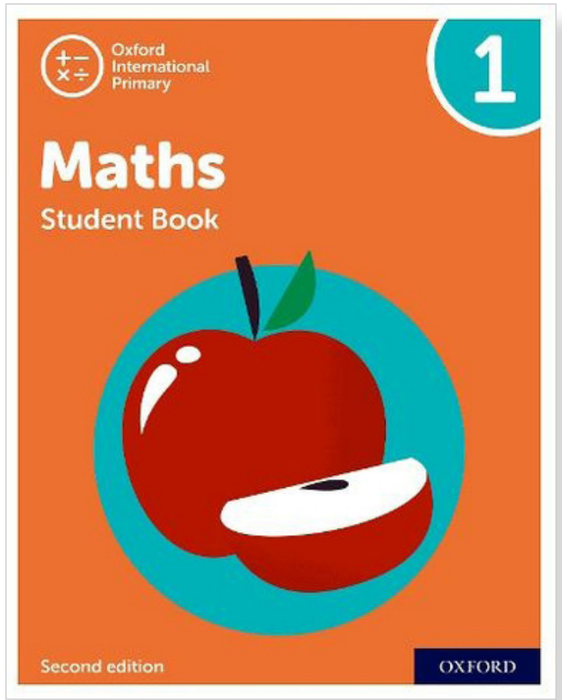
Extending: The student can draw and use tree diagrams and solve related problems.

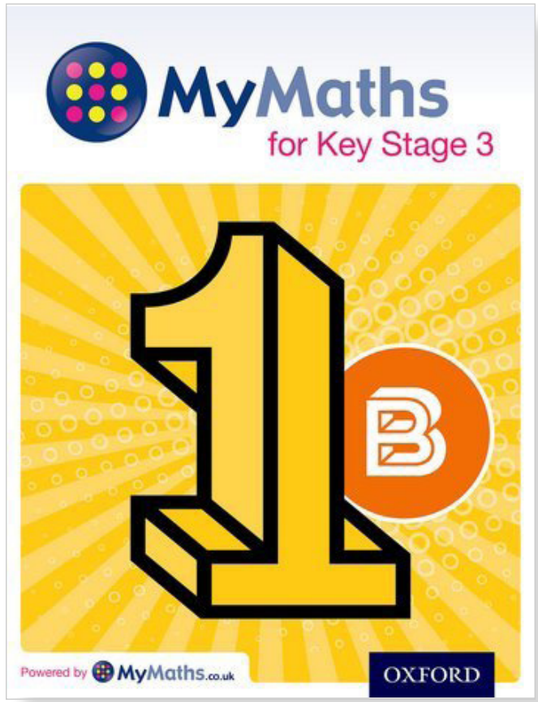
Resources

The Oxford International Curriculum for Maths has been devised to complement specific Oxford University Press resources. We recommend that schools following the Oxford International Curriculum for Maths use the *Oxford International Primary Maths* series at primary level. At lower secondary level, we recommend *MyMaths for Key Stage 3*. Teaching of the curriculum can also be supported by *MyiMaths*, a whole-school interactive resource for use in the classroom and at home.

Oxford International Primary Maths
MyMaths for KS3

Together, these series provide a complete and integrated nine-year (Years 1–9) Maths course.





Oxford International Primary Maths

- A problem-solving approach to primary maths
- Support for EAL learners
- A five-step approach to learning mathematics (engage, discover, explore, connect, and review) ensures students learn about maths in context
- Student books and write-in workbooks for every level

MyMaths for Key Stage 3

- A problem-solving approach, with creative ideas for teachers to embed this approach
- Differentiated structure to meet the needs of all levels of ability
- Links to resources on the MyiMaths site, to teach in an effective and blended way

Using the resources with the Oxford International Curriculum

The recommended student books can be used alongside the Oxford International Curriculum for Maths schemes of work and lesson plans. Lesson plans signpost relevant pages in the student book, as well as directing teachers towards appropriate activities in the workbooks, where relevant.

To learn more about these resources, please see:
www.oxfordprimary.com/international-maths
www.oxfordsecondary.com/mymathsks3
www.myimaths.com

Glossary

Assessment framework: a conceptual map indicating how learning outcomes will be assessed, with every learning outcome broken down into 'developing', 'secure' and 'Extending' statements

Creative skills: skills that foster students' innate curiosity and creativity

Curriculum at a glance: a table-format overview providing a snapshot of learning outcomes for every year group

Developing: one of the three assessment statements that make up the assessment framework, this indicates that students are working towards the learning outcome

Differentiation: the creation of varied learning pathways through the curriculum, to enable teaching that caters to the needs of all learners

Emotional intelligence: the ability to understand one's own feelings and emotions, and also those of others, and regulate them skilfully

End-of-year assessment: tests developed to determine student progress and attainment at the end of each academic year

Enquiry-based learning: an approach to learning which invites students to actively shape their learning journeys, placing problem-solving and real-world applications at the heart of the curriculum

Extending: one of the three assessment statements that make up the assessment framework, this indicates that students are working beyond the learning outcome

Formative assessment: low stakes, continuous assessment for learning, which helps to guide future learning and interventions

Functional literacies: the numerical, digital, and language literacy our students need to succeed in the 21st century

Global Skills Projects: a project-based, interdisciplinary course that seeks to develop thoughtful, innovative change-makers who are equipped with the skills to succeed in a changing world

Growth mindset: a belief that your intelligence and abilities can be developed by embracing challenges, sustaining effort, and trying new strategies – a growth mindset leads to greater motivation and achievement

Interpersonal skills: skills which support lifelong learning, through developing communication, relationship-building and leadership skills

Joy of learning: an approach to teaching and learning focused on wellbeing, which places joy at the heart of the curriculum and develops global skills needed by learners to thrive throughout their lives

Learning outcomes: clear statements which describe what a student is expected to be able to do or understand after a specific period of study

Lesson plans: a programme of study for any given lesson, aligned to specific outcomes within the curriculum

Mindful moments: opportunities for students to refocus their attention on the present moment

Pedagogy: the approach to teaching and learning, guiding the way in which the curriculum is taught to students

Positive education: a combination of academics, character and wellbeing

Process praise: praising how students work, rather than only praising the outcome, for example, praising effort, perseverance, resilience, teamwork and strategies

Project-based learning: an active, enquiry-based pedagogy that allows rich interdisciplinary learning as students engage with real-life scenarios that demonstrate the relevance of skills and theories

Real-life skills: skills which support lifelong learning, including project management, functional literacies and research

Resilience: possessing the inner resources and the ability to withstand and overcome adversity and difficulties

Scheme of work: a week-by-week, lesson-by-lesson plan which details how to deliver the learning outcomes within the curriculum

Secure: one of the three assessment statements that make up the assessment framework – this indicates that students are secure in the learning outcome

Self-development skills: skills which support lifelong learning, including critical thinking, ethics and self-motivation

Spiral approach: the model by which underlying learning themes of the curriculum are revisited each year at higher levels of complexity and depth – the spiral development model reinforces learning and builds on previous achievement

Stretch zone: a visual metaphor to help explain that we learn the most when we do challenging work

Summative assessment: assessment of learning provided to evaluate student progress at the end of a given topic/unit/year

Wellbeing: both a curriculum subject and guiding principle, which supports the practice of healthy habits of body and mind to enhance the lives of teachers and learners, giving them skills that can apply in their lives today and in the future

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