Cayton School

Learn from yesterday, seek today and aim for tomorrow

C - Courage	A - Achievement	Y – Your Actions	T - Tolerance	O – Our World	N - Nurturing

Cayton School

Maths Progression Map

Learn from yesterday, seek today and aim for tomorrow

Maths Progression Documents

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Intent

Cayton School Vision	*"To deliver the highest standards enabling children and adults to grow, learn and work together where laughter, respect, trust and harmony are highly valued"*

Cayton School Values	Happy and Harmonious	Confident and Caring	Lively and Life-Long-Learning	Successful and Secure	Proud and Positive	Challenge and Commitment
Why Cayton School Curriculum is unique	We have written our curriculum with a strong emphasis towards Local: Community, History, Geography, Culture and Faith	Our Curriculum has a rich knowledge base and strong skills development	A strong emphasis on vocabulary allows children to learn and apply words in a variety of contexts	Cultural Capital opportunities support children to accomplish the very best they can be	PSHE is a thread that runs throughout our Curriculum	We have written the Curriculum to support children to develop lively, enquiring and creative minds	We understand the importance of a healthy body, healthy mind which is prioritised throughout our Curriculum

Intent	Our overriding belief at Cayton School is that our role as Educators is to ensure children are prepared for the future and have the skills to be life long, curious learners. We passionately believe that life skills as well as academic success is vitally important. Our curriculum is designed to ensure life-long learners who are kind, confident and successful. Our designing of our bespoke curriculum was underpinned by evidence and research in order to challenge thinking and encourage enquiry.

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Implementation

Delivering the Curriculum	A whole school, topic based approach	A strong emphasis on positive behaviour through Cayton Awards	A whole school approach to PSHE	Opportunities for collaborative and shared work	The importance of Reading is implemented throughout our Curriculum offer	Every child has a Cayton, Cultural, Capital, Citizenship Passport throughout school
Evidence Based Research	Metacognition 'learning to learn' using scaffolding strategies EEF evidence		Language skills at the centre of Quality First Teaching Rose Report/ EEF		English Curriculum delivery has a strong emphasis on vocabulary and reading Reading spine Doug Lemov	The power of 'empowerment' Dr Raj Persaud/ Hertzog Performance=Skills x Motivation
Pedagogy	Importance of staff well-being	Emphasis on continued professional empowerment Abraham Maslow's Hierarchy of Needs	Monitoring and coaching supporting good practice throughout school	Golden thread supporting school development	Positive culture of fairness and equality	Strong 'Safeguarding' culture throughout school	A welcoming, supportive and inclusive school at the heart of everything we do
Processes and Procedures	A strong focus on assessment for learning throughout school	Training and empowerment of subject leaders to lead their subjects	Clear guidance and structure in teaching core subjects	Robust assessment of core and foundation subjects throughout school	Clear rules and routines set out to support all children

Implementation	Professional Development and Empowerment of staff supports pedagogical theories and research and equips all teachers to confidently deliver and implement the Curriculum. We implement clear structures and teaching sequences, which underpin the teaching of Reading, Writing and Mathematics. The whole curriculum is taught through 'Metacognitive' pedagogy which encourages children to 'learn to learn' and self-regulate, thus enabling them to question their learning.

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Impact

What 'success' looks like at Cayton School	Children develop self-confidence and self-esteem	High Quality Outcomes for all children based on their starting points	Strong feeling of Community	A rich and diverse school culture	Children prepared for life-long learning
Ambition	Children and adults are proud of themselves and proud to be part of the Cayton Community	Progress and attainment at each Key Stage shows outcomes as being above the 'National Average'	Children and adults are kind, courteous and confident	Adults are a positive role model in all that they do and say	Children are self -regulated in their learning and take responsibility for their actions
Evidence	Outcomes at each stage of learning	Pupil and staff voice	Impact of school development priorities	Stakeholder feedback	Formal and Informal assessments	A positive Cayton Awards Culture throughout school

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Developing Mathematicians at Cayton School

A Mathematician at Cayton School will …

- have a secure understanding of the number system and place value.

- seek out patterns and trends within number.

- formulate conjectures about numbers and problems.

- be fluent and efficient when calculating and working with number.

- establish truth through reasoning and problem solving.

- identify and link methods to real-life problems.

- recall facts and prior knowledge to inform new methods and concepts.

- build on prior knowledge to enhance their understanding.

Maths Progression Documents

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Ambition

Learning and aiming for the future is at the heart of learning in Mathematics at Cayton. Our mathematics curriculum at Cayton School provides children with a foundation for **understanding number**, **reasoning, thinking logically and problem solving** with resilience so that they are fully prepared for the future. We do this by using every opportunity to include a varied approach to mathematics that include fluency, reasoning and problem solving. It is essential that these keystones of Mathematics are embedded throughout all strands of the National Curriculum. By adopting a Mastery approach, it is also intended that all children, regardless of their starting point, will maximise their academic achievement and leave Cayton School with an appreciation and enthusiasm for Maths, resulting in a lifelong positive relationship with number. We do this by:

- ensuring that we deliver a high quality maths curriculum that is both challenging and enjoyable.
- enabling children children to make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems.
- allowing our pupils to be able to apply their mathematical knowledge to science and other subjects.
- showing that maths is essential to everyday life and that our children are confident mathematicians who are not afraid to take risks.
- developing independent learners with inquisitive minds who have secure mathematical foundations and an interest in self-improvement.
- encouraging children to build upon their knowledge, understanding and skills from EYFS to Year 6

Special Educational Needs and Disabilities (SEND) Inclusive Provision for Mathematics

In Mathematics, we adopt a mastery approach that enables every child to engage and achieve their full potential and have a deeper understanding of concepts that are taught no matter what their prior ability. Where possible, children should be working towards a common goal and working on the same material which increases in difficulty as the task progresses. Tasks may be scaffolded in different ways to enable learners to understand and progress in knowledge and skills.

At Cayton, we use a concrete, pictorial and abstract approach to allow a range of learning styles to achieve and see Maths in new ways. This allows children to physically see the Maths in motion and children can relate the manipulation of resources to the extension of abstract ideas and concepts. Planning for these opportunities should be reactive in the planning and adapted to allow for reflection time of concepts and consolidation time of methods. We believe in embracing mistakes to build a good resilience in mathematics and where they are seen as a learning opportunity.

To enable Mastery, some of the following adaptations may be used:

- Pre-teaching group work looking at specific vocabulary or concepts in Mathematics that the children may find tricky.
- Small group support of an adult to guide them through the activities they are given.
- 1:1 support where and when necessary.
- Word mats that explain some of the key concepts or vocabulary of Mathematics to help the children understand further.
- Knowledge organisers to start Mathematics units to refer back to if they are unsure of a particular concept such as place value knowledge, square number knowledge or representations of fractions.
- Further resources around the classroom to help further understand concepts such as counters, number fans, beads, place value charts.
- Adapted worksheets to help with the understanding of wording or explanations.

Maths Progression Documents

Early Years

In planning and guiding what children learn, practitioners must reflect on the different rates at which children are developing and adjust their practice appropriately. Three characteristics of effective teaching and learning are:

- playing and exploring - children investigate and experience things, and 'have a go'
- active learning - children concentrate and keep on trying if they encounter difficulties, and enjoy achievements
- creating and thinking critically - children have and develop their own ideas, make links between ideas, and develop strategies for doing things
  In addition, the Prime Areas of Learning (Personal, Social and Emotional Development, Communication and Language and Physical Development) underpin and are an integral part of children's learning in all areas.

EYFS Mathematics (Statutory)

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

EYFS Mathematics

Number	Number facts	Numerical Patterns	Measure, Shape and Space	Key vocabulary
• **Have a deep understanding** of number to 10, including the composition of each number; • **Subitise** (recognise quantities without counting) up to 5	• Automatically **recall** (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.	• Verbally **count** beyond 20, **recognising** the pattern of the counting system; • **Compare** quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity; • **Explore and represent** patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.	• Safely **use** and **explore** a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function; including measuring. • **Recognise** a range of shapes and link items that have the same shape.	**Use** enriching and widening children's vocabulary that will support later reading comprehension See vocabulary sheets.
• Count • Read and write • Identify • Represent	• Recall • Count • Add • Subtract	• Count • Compare • Explore • Represent	• Use • Explore • Recognise	• Use • Explore

Maths Progression Documents

Key Stage 1

Purpose of Study
Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

National Curriculum
The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources [for example, concrete objects and measuring tools]. At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money. By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency. Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

Key Stage 2

Purpose of Study
Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

National Curriculum
Lower Key Stage 2 - The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the 4 operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number. By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work. Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word-reading knowledge and their knowledge of spelling.
Upper Key Stage 2 - The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio. At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them. By the end of year 6, pupils should be fluent in written methods for all 4 operations, including long multiplication and division, and in working with fractions, decimals and percentages. Pupils should read, spell and pronounce mathematical vocabulary correctly.

Maths Progression Documents

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Progression of knowledge of skills – Number and Place Value

Strand	1	2	3	4	5	6
Number and place value	• **count** to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number • **count, read and write** numbers to 100 in numerals; **count** in multiples of 2s, 5s and 10s • given a number, **identify** 1 more and 1 less • **identify and represent** numbers **using** objects and pictorial representations including the number line, and **use** the language of: equal to, more than, less than (fewer), most, least • **read and write** numbers from 1 to 20 in numerals and words	• **count** in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward • **recognise** the place value of each digit in a two-digit number (10s, 1s) • **identify, represent and estimate** numbers using different representations, including the number line • **compare and order** numbers from 0 up to 100; use <, > and = signs • **read and write** numbers to at least 100 in numerals and in words • **use** place value and number facts to solve problems	• **count** from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number. • **recognise** the place value of each digit in a 3-digit number (100s, 10s, 1s) • **compare and order** numbers up to 1,000 • **identify, represent and estimate** numbers using different representations • **read and write** numbers up to 1,000 in numerals and in words • **solve** number problems and practical problems involving these ideas	• **count** in multiples of 6, 7, 9, 25 and 1,000 • **identify** 1,000 more or less than a given number • **count backwards** through 0 to include negative numbers • **recognise** the place value of each digit in a four-digit number (1,000s, 100s, 10s, and 1s) • **order and compare** numbers beyond 1,000 • **identify, represent and estimate** numbers using different representations • **round** any number to the nearest 10, 100 or 1,000 • **solve** number and practical problems that involve all of the above and with increasingly large positive numbers • **read** Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of 0 and place value	• **read, write, order and compare** numbers to at least 1,000,000 and **determine the value** of each digit • **count forwards or backwards** in steps of powers of 10 for any given number up to 1,000,000 • **interpret** negative numbers in context, **count forwards and backwards** with positive and negative whole numbers, including through 0 • **round** any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000 • **solve** number problems and practical problems that involve all of the above • **read** Roman numerals to 1,000 (M) and recognise years written in Roman numerals	• **read, write, order and compare** numbers up to 10,000,000 and **determine the value** of each digit • **round** any whole number to a required degree of accuracy • **use** negative numbers in context, and **calculate** intervals across 0 • **solve** number and practical problems that involve all of the above
Skills	○ **Count** ○ **Read and write** ○ **Identify** ○ **Represent** ○ **Use**	○ **Count** ○ **Read and write** ○ **Identify** ○ **Recognise** ○ **Represent** ○ **Use** ○ **Compare and order**	○ **Count** ○ **Read and write** ○ **Identify** ○ **Recognise** ○ **Represent** ○ **Use** ○ **Compare and order** ○ **Estimate** ○ **Solve**	○ **Count** ○ **Read and write** ○ **Identify** ○ **Recognise** ○ **Represent** ○ **Compare and order** ○ **Estimate** ○ **Solve** ○ **Round**	○ **Count** ○ **Read and write** ○ **Identify** ○ **Recognise** ○ **Represent** ○ **Compare and order** ○ **Estimate** ○ **Solve** ○ **Round** ○ **Determine** ○ **Interpret**	○ **Read and write** ○ **Identify** ○ **Recognise** ○ **Calculate** ○ **Compare and order** ○ **Estimate** ○ **Solve** ○ **Round** ○ **Determine** ○ **Use**

Maths Progression Documents

Progression of knowledge of skills – Addition and Subtraction

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Strand	1	2	3	4	5	6
Addition and Sutraction	• **read, write and interpret** mathematical statements involving addition (+), subtraction (−) and equals (=) signs • **represent** and **use** number bonds and related subtraction facts within 20 • **add** and **subtract** one-digit and two-digit numbers to 20, including 0 • **solve** one-step problems that involve **addition** and **subtraction**, **using** concrete objects and pictorial **representations**, and missing number problems such as 7 = ? – 9	• **solve** problems with **addition** and **subtraction**: ○ **using** concrete objects and pictorial **representations**, including those involving numbers, quantities and measures ○ **applying** their increasing knowledge of **mental** and **written** methods • **recall** and **use addition** and **subtraction** facts to 20 **fluently**, and **derive** and **use** related facts up to 100 • **add** and **subtract** numbers using concrete objects, pictorial **representations**, and **mentally**, including: ○ a two-digit number and 1s ○ a two-digit number and 10s ○ 2 two-digit numbers ○ adding 3 one-digit numbers • **show** that **addition** of 2 numbers can be done in any order (commutative) and **subtraction** of 1 number from another cannot • **recognise** and **use** the **inverse** relationship between **addition** and **subtraction** and use this to **check** calculations and **solve** missing number problems	• **add** and **subtract** numbers **mentally**, including: ○ a three-digit number and 1s ○ a three-digit number and 10s ○ a three-digit number and 100s • **add** and **subtract** numbers with up to 3 digits, **using formal written** methods of columnar addition and **subtraction** • **estimate** the answer to a **calculation** and **use inverse** operations to **check** answers • **solve** problems, including missing number problems, **using** number facts, place value, and more complex **addition** and **subtraction**	• **add** and **subtract** numbers with up to 4 digits **using** the **formal written** methods of columnar **addition** and **subtraction** where appropriate • **estimate** and **use inverse** operations to **check** answers to a **calculation** • **solve addition** and **subtraction** two-step problems in contexts, **deciding** which operations and methods to **use** and why	• **add** and **subtract** whole numbers with more than 4 digits, including **using** formal written methods (columnar **addition** and **subtraction**) • **add** and **subtract** numbers **mentally** with increasingly large numbers • **use rounding** to **check** answers to **calculations** and **determine**, in the context of a **problem**, levels of accuracy • **solve addition** and **subtraction multi-step problems** in contexts, **deciding** which operations and methods to **use** and why	• **perform mental calculations**, including with mixed operations and large numbers • **use** their knowledge of the **order of operations** to carry out **calculations** involving the 4 operations • **solve addition and subtraction** multi-step problems in contexts, **deciding** which operations and methods to **use** and why • **solve** problems involving **addition and subtraction** • **use estimation** to **check** answers to **calculations** and **determine**, in the context of a problem, an appropriate degree of accuracy
Skills	○ **Read and write** ○ **Interpret** ○ **Represent** ○ **Use** ○ **Add** ○ **Subtract**	○ **Recall** ○ **Check** ○ **Represent** ○ **Use** ○ **Add** ○ **Subtract** ○ **Solve** ○ **Apply** ○ **Mental methods** ○ **Prove (show)** ○ **Inverse**	○ **Add** ○ **Subtract** ○ **Use** ○ **Solve** ○ **Apply** ○ **Mental methods** ○ **Formal methods** ○ **Prove (show)** ○ **Inverse** ○ **Estimate** ○ **Calculate**	○ **Add** ○ **Subtract** ○ **Use** ○ **Solve** ○ **Apply** ○ **Mental methods** ○ **Formal methods** ○ **Prove/explain (why)** ○ **Inverse** ○ **Estimate** ○ **Calculate** ○ **Determine/decide**	○ **Add** ○ **Subtract** ○ **Use** ○ **Solve** ○ **Apply** ○ **Mental methods** ○ **Formal methods** ○ **Prove/explain (why)** ○ **Inverse** ○ **Estimate** ○ **Calculate** ○ **Determine/decide**	○ **Add** ○ **Subtract** ○ **Use** ○ **Solve** ○ **Apply** ○ **Mental methods** ○ **Formal methods** ○ **Prove/explain (why)** ○ **Inverse** ○ **Estimate** ○ **Calculate** ○ **Determine/decide**

Maths Progression Documents

Progression of knowledge of skills – Multiplication and Division

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Strand	1	2	3	4	5	6
Multiplication and Division	**solve** one-step problems involving **multiplication** and **division**, by **calculating** the answer **using** concrete objects, pictorial **representations** and **arrays** with the support of the teacher	• **recall** and **use** **multiplication** and **division** facts for the 2, 5 and 10 **multiplication** tables, including **recognising** odd and even numbers • **calculate** mathematical statements for **multiplication** and **division** within the **multiplication** tables and **write** them using the **multiplication** (×), **division** (÷) and equals (=) signs • **show** that **multiplication** of 2 numbers can be done in any order (commutative) and **division** of 1 number by another cannot • **solve** problems involving **multiplication** and **division**, using materials, **arrays**, **repeated addition**, **mental methods**, and **multiplication** and **division** facts, including **problems** in contexts	• **recall** and use **multiplication** and **division** facts for the 3, 4 and 8 **multiplication** tables • **write** and **calculate** mathematical statements for **multiplication** and **division using** the **multiplication tables** that they know, including for two-digit numbers times one-digit numbers, **using mental** and progressing to **formal written methods** • **solve** problems, including missing number problems, involving **multiplication** and **division**, including positive integer **scaling** problems and correspondence problems in which n objects are connected to m objects	• **recall multiplication and division** facts for **multiplication tables** up to 12 × 12 • **use** place value, known and **derived facts** to **multiply and divide mentally**, including: **multiplying** by 0 and 1; **dividing** by 1; **multiplying** together 3 numbers • **recognise** and **use** factor pairs and commutativity in **mental calculations** • **multiply** two-digit and three-digit numbers by a one-digit number **using formal written layout** • **solve** problems involving **multiplying** and **adding**, including using the distributive law to **multiply** two-digit numbers by 1 digit, integer **scaling** problems and harder correspondence problems such as n objects are connected to m objects	• **identify multiples and factors**, including **finding** all factor pairs of a number, and **common factors** of 2 numbers • **know** and **use** the vocabulary of **prime numbers**, **prime factors** and **composite (non-prime) numbers** • **establish** whether a number up to 100 is prime and **recall** prime numbers up to 19 • **multiply** numbers up to 4 digits by a one- or two-digit number **using a formal written method**, including **long multiplication** for two-digit numbers • **multiply** and **divide** numbers **mentally**, drawing upon known facts • **divide** numbers up to 4 digits by a one-digit number using the **formal written method** of **short division** and **interpret** remainders appropriately for the context • **multiply and divide** whole numbers and those involving decimals by 10, 100 and 1,000 • **recognise and use square numbers and cube numbers**, and the notation for squared (^{2}) and cubed (^{3}) • **solve** problems involving the four operations, including **using** their knowledge of factors and multiples, squares and cubes; including **scaling** by simple fractions and problems involving simple rates	• **multiply** multi-digit numbers up to 4 digits by a two-digit whole number **using the formal written method** of **long multiplication** • **divide** numbers up to 4 digits by a two-digit whole number **using the formal written method** of **long division**, and **interpret** remainders as whole number remainders, **fractions**, or by **rounding,** as appropriate for the context • **divide** numbers up to 4 digits by a two-digit number using the **formal written method** of **short division** where appropriate, **interpreting** remainders according to the context • **perform mental calculations**, including with mixed operations and large numbers • **identify** common factors, common multiples and prime numbers • **use** their knowledge of the **order of operations** to carry out **calculations** involving the 4 operations • **solve** problems involving **multiplication and division** • **use estimation** to **check** answers to **calculations** and **determine**, in the context of a problem, an appropriate degree of accuracy
Skills	**Solve** **Represent** **Multiplication** **Division** **Calculate**	o **Recall** o **Use** o **Multiplication** o **Division** o **Recognise** o **Write** o **Show** o **Solve**	o **Recall** o **Multiplication** o **Division** o **Recognise** o **Write** o **Formal/mental methods** o **Scaling** o **Solve** o **Calculate**	o **Recall** o **Multiplication** o **Division** o **Recognise** o **Write** o **Formal/mental methods** o **Scaling** o **Solve** o **Calculate**	o **Identify** o **Multiplication** o **Division** o **Recognise** o **Know and use** o **Formal/mental methods** o **Scaling** o **Solve** o **Calculate**	o **Identify** o **Multiplication** o **Division** o **Recognise** o **Know and use** o **Formal/mental methods** o **Scaling** o **Solve** o **Estimate/calculate/check**

Strand	1	2	3	4	5	6
Fractions, decimals and percentages	• **recognise, find and name** a half as 1 of 2 equal parts of an object, shape or quantity • **recognise, find and name** a quarter as 1 of 4 equal parts of an object, shape or quantity	• **recognise, find, name and write** fractions third, quarter, two-quarters and three-quarters of a length, shape, set of objects or quantity • **write** simple fractions	• **count** up and down in tenths; **recognise** that tenths arise from **dividing** an object into 10 equal parts and in **dividing** one-digit numbers or quantities by 10 • **recognise, find and write** fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators • **recognise and use** fractions as numbers: unit fractions and non-unit fractions with small denominators • **recognise and show, using diagrams**, equivalent fractions with small denominators • **add and subtract fractions** with the same denominator within one whole • **compare and order** unit fractions, and fractions with the same denominators • **solve** problems that involve all of the above	• **recognise and show, using** diagrams, families of common equivalent fractions • **count** up and down in hundredths; **recognise** that hundredths arise when **dividing** an object by 100 and dividing tenths by 10 • **solve** problems involving increasingly harder fractions to **calculate** quantities, and fractions to **divide** quantities, including non-unit fractions where the answer is a whole number • **add and subtract fractions** with the same denominator • **recognise and write** decimal equivalents of any number of tenths or hundreds • **recognise and write** decimal equivalents to quarter, half and three-quarters • **find** the effect of **dividing** a one- or two-digit number by 10 and 100, **identifying** the value of the digits in the answer as ones, tenths and hundredths • **round** decimals with 1 decimal place to the nearest whole number • **compare** numbers with the same number of decimal places up to 2 decimal places • **solve** simple measure and money problems involving fractions and decimals to 2 decimal places	• **compare and order** fractions whose denominators are all multiples of the same number • **identify, name and write** equivalent fractions of a given fraction, represented visually, including tenths and hundredths • **recognise** mixed numbers and improper fractions and **convert** from one form to the other and write mathematical statements > 1 as a mixed number • **add and subtract fractions** with the same denominator, and denominators that are multiples of the same number • **multiply** proper fractions and mixed numbers by whole numbers, supported by materials and diagrams • **read and write** decimal numbers as fractions • **recognise and use** thousandths and relate them to tenths, hundredths and decimal equivalents • **round** decimals with 2 decimal places to the nearest whole number and to 1 decimal place • **read, write, order and compare** numbers with up to 3 decimal places • **solve** problems involving number up to 3 decimal places • **recognise** the per cent symbol (%) and **understand** that per cent relates to 'number of parts per 100', and write percentages as a fraction with denominator 100, and as a decimal fraction • **solve** problems which require knowing percentage and decimal equivalents of half, quarter, fifth, two-fifths, four-fifths and those fractions with denominators of multiples of 10 or 25.	• **use** common factors to simplify fractions; **use** common multiples to **express** fractions in the same denomination • **compare and order** fractions, including fractions >1 • **add and subtract** fractions with different denominators and mixed numbers, **using** the concept of equivalent fractions • **multiply** simple pairs of proper fractions, **writing** the answer in its simplest form • divide proper fractions by whole numbers • **associate** a fraction with **division** and **calculate** decimal fraction equivalents [for example, 0.375] for a simple fraction • **identify** the value of each digit in numbers given to 3 decimal places and **multiply and divide** numbers by 10, 100 and 1,000 giving answers up to 3 decimal places • **multiply** one-digit numbers with up to 2 decimal places by whole numbers • **use written division** methods in cases where the answer has up to 2 decimal places • **solve** problems which require answers to be **rounded** to specified degrees of accuracy • **recall and use** equivalences between simple fractions, decimals and percentages, including in different contexts
Skills	recognise find name	Recognise Find Name Write	o **Count** o **Find/Recognise** o **Division** o **Find** o **Write** o **Use/solve** o **Show** o **Add/subtract fractions** o **Compare and order**	o **Count** o **Recognise/identify** o **Division** o **Find** o **Write** o **Use (including diagrams)** o **Show** o **Add/subtract fractions** o **Solve/calculate** o **Compare**	o **Count** o **Recognise/identify** o **Division** o **Find** o **Write** o **Use (including diagrams)** o **Show** o **Add/subtract fractions** o **Solve/calculate** o **Compare/order**	o **Count** o **Recognise/identify/recall** o **Division** o **Find** o **Write** o **Use (including diagrams)** o **Show** o **Add/subtract fractions** o **Solve/calculate** o **Compare/order**

Maths Progression Documents

Progression of knowledge of skills – Measurement

Cayton School
Learn from yesterday, seek today and aim for tomorrow

Strand	1	2	3	4	5	6
Measurement	• **compare, describe and solve** practical problems for: length and heights, mass/weight, capacity and volume, time. • **measure** and begin to **record** the following: length and heights, mass/weight, capacity and volume, time. • **recognise and know** the value of different denominations of coins and notes • **sequence** events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] • **recognise and use** language relating to dates, including days of the week, weeks, months and years • **tell the time** to the hour and half past the hour and draw the hands on a clock face to show these times	• **choose and use** appropriate standard units to **estimate** and **measure** length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels • **compare and order** lengths, mass, volume/capacity and record the results using >, < and = • **recognise and use** symbols for pounds (£) and pence (p); combine amounts to make a particular value • **find** different combinations of coins that equal the same amounts of money • **solve** simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change • compare and sequence intervals of time • **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 • **know** the number of minutes in an hour and the number of hours in a day	• **measure, compare, add and subtract**: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) • **measure** the perimeter of simple 2-D shapes • **add and subtract** amounts of money to give change, using both £ and p in practical contexts • **tell and write** the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks • **estimate and read time** with increasing accuracy to the nearest minute; record and **compare time** in terms of seconds, minutes and hours; **use vocabulary** such as o'clock, am/pm, morning, afternoon, noon and midnight • **know** the number of seconds in a minute and the number of days in each month, year and leap year • **compare** durations of events	• **convert** between different units of measure • **measure and calculate** the perimeter of a rectilinear figure (including squares) in centimetres and metres • **find** the area of rectilinear shapes by counting squares • **estimate, compare and calculate** different measures, including money in pounds and pence • **read, write and convert time** between analogue and digital 12- and 24-hour clocks • **solve** problems involving **converting** from hours to minutes, minutes to seconds, years to months, weeks to days	• **convert** between different units of metric measure • **understand and use** approximate equivalences between metric units and common imperial units • **measure and calculate** the perimeter of composite rectilinear shapes in centimetres and metres • **calculate and compare** the area of rectangles (including squares), including **using** standard units, square centimetres (cm²) and square metres (m²), and **estimate** the area of irregular shapes • **estimate** volume and capacity • **solve** problems involving converting between units of time • **use** all four operations to **solve** problems involving measure [for example, length, mass, volume, money] using decimal notation, including **scaling**	• **solve** problems involving the calculation and **conversion** of units of measure, **using** decimal notation up to 3 decimal places where appropriate • **use, read, write and convert** between standard units, **converting** measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, **using** decimal notation to up to 3 decimal places • **convert** between miles and kilometres • **recognise** that shapes with the same areas can have different perimeters and vice versa • **recognise** when it is possible to use formulae for area and volume of shapes • **calculate** the area of parallelograms and triangles • **calculate, estimate and compare** volume of cubes and cuboids **using** standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units
Skills	o **Compare and describe** o **Solve** o **Measure** o **Recognise** o **Know** o **Use** o **Sequence** o **Tell the time**	o **Chose and use** o **Estimate and measure** o **Compare and order** o **Recognise** o **Find and know** o **Solve** o **Compare and sequence** o **Tell the time and write times**	o **Measure** o **Compare** o **Tell and write the time** o **Estimate** o **Know**	o **Measure** o **Compare** o **Read, tell and write the time** o **Estimate** o **Convert** o **Solve** o **Calculate**	o **Measure** o **Compare** o **Read, tell and write the time** o **Estimate** o **Convert** o **Solve** o **Calculate**	o **Use, read and write** o **Compare** o **Convert** o **Estimate** o **Convert** o **Solve** o **Recognise** o **Calculate**

Maths Progression Documents
Progression of knowledge of skills – Geometry

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Strand	1	2	3	4	5	6
Geometry – Properties of shapes	• **recognise and name** common 2-D and 3-D shapes, including: o 2-D shapes [for example, rectangles (including squares), circles and triangles] o 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]	• **identify and describe** the properties of 2-D shapes, including the number of sides, and line symmetry in a vertical line • **identify and describe** the properties of 3-D shapes, including the number of edges, vertices and faces • **identify** 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] • **compare and sort** common 2-D and 3-D shapes and everyday objects	• **draw** 2-D shapes and make 3-D shapes using modelling materials; **recognise** 3-D shapes in different orientations and describe them • **recognise** angles as a property of shape or a description of a turn • **identify** right angles, recognise that 2 right angles make a half-turn, 3 make three-quarters of a turn and 4 a complete turn; identify whether angles are greater than or less than a right angle • **identify** horizontal and vertical lines and pairs of perpendicular and parallel lines	• **compare and classify** geometric shapes, including quadrilaterals and triangles, based on their properties and sizes • **identify** acute and obtuse angles and **compare and order** angles up to 2 right angles by size • **identify** lines of symmetry in 2-D shapes presented in different orientations • **complete a simple symmetric** figure with respect to a specific line of symmetry	• **identify** 3-D shapes, including cubes and other cuboids, from 2-D representations • **know** angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • **draw** given angles, and measure them in degrees (°) • **identify:** o angles at a point and 1 whole turn (total 360°) o angles at a point on a straight line and half a turn (total 180°) o other multiples of 90° • **use** the properties of rectangles to deduce related facts and find missing lengths and angles • **distinguish** between regular and irregular polygons based on **reasoning** about equal sides and angles	• **draw** 2-D shapes using given dimensions and angles • **recognise, describe and build** simple 3-D shapes, including making nets • **compare and classify** geometric shapes based on their properties and sizes and **find** unknown angles in any triangles, quadrilaterals, and regular polygons • **illustrate and name** parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius • **recognise** angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
Geometry – Position and direction	• **describe** position, direction and movement, including whole, half, quarter and three-quarter turns	• **order and arrange** combinations of mathematical objects in patterns and sequences • **use** mathematical vocabulary to **describe** position, direction and movement, including movement in a straight line and **distinguishing** between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)	• Pupils connect decimals and rounding to drawing and measuring straight lines in centimetres, in a variety of contexts. (Non-statutory)	• **describe** positions on a 2-D grid as coordinates in the first quadrant • **describe** movements between positions as translations of a given unit to the left/right and up/down • **plot** specified points and draw sides to complete a given polygon	• **identify, describe and represent** the position of a shape following a reflection or translation, **using** the appropriate language, and **know** that the shape has not changed	• **describe** positions on the full coordinate grid (all 4 quadrants) • **draw and translate** simple shapes on the coordinate plane, and reflect them in the axes
Skills	o Recognise o Name o Describe	o Identify o Describe o Compare o Sort o Order and arrange o Use o Distinguish	o Draw o Recognise o Identify o Connect	o Classify o Compare o Identify o Complete symmetry o Describe o Plot	o Draw and know o Recognise and describe o Build o Compare and classify o Illustrate and name o Distinguish o Represent	o Draw o Recognise and describe o Build o Compare and classify o Illustrate and name o translate

Maths Progression Documents

Progression of knowledge of skills – Extra Units

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Strand	1	2	3	4	5	6
Extra units – Statistics (Y2, 3, 4, 5 and 6) Ratio and proportion – Y6 ONLY Algebra – Year 6 ONLY	N/A	• **interpret and construct** simple pictograms, tally charts, block diagrams and tables • **ask and answer** simple questions by counting the number of objects in each category and sorting the categories by quantity • **ask-and-answer** questions about totalling and comparing categorical data	• **interpret and present** data using bar charts, pictograms and tables • **solve** one-step and two-step questions [for example 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables	• **interpret and present** discrete and continuous data using appropriate graphical methods, including bar charts and time graphs • **solve** comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs	• **solve** comparison, sum and difference problems **using** information presented in a line graph • **complete, read and interpret** information in tables, including timetables	**Statistics** • **interpret and construct** pie charts and line graphs and **use** these to solve problems • **calculate and interpret** the mean as an average **Algebra** • **use** simple formulae • **generate and describe** linear number sequences • **express** missing number problems algebraically • **find** pairs of numbers that satisfy an equation with 2 unknowns • **enumerate** possibilities of combinations of 2 variables **Ratio and Proportion** • **solve** problems involving the relative sizes of 2 quantities where missing values can be found by using integer multiplication and division facts • **solve** problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison • **solve** problems involving similar shapes where the scale factor is known or can be found • **solve** problems involving unequal sharing and grouping using knowledge of fractions and multiples
Skills		○ **Interpret** ○ **Construct** ○ **Ask and answer**	○ **Interpret** ○ **Present** ○ **Solve**	○ **Interpret** ○ **Present** ○ **Solve**	○ **Complete** ○ **Read** ○ **Interpret** ○ **Solve**	○ **Interpret** ○ **Construct** ○ **Use** ○ **Generate and describe** ○ **Express** ○ **Find** ○ **Enumerate** ○ **Solve**

Maths Progression Documents

Implementation

- Our implementation is developed through secure understanding of the curriculum and subject area.
- Children will have access to a wide range of resources to ensure that a concrete understanding of learning is accessible for all learning including those with SEND.
- A clear and effective scheme of work that provides coverage in line with the National Curriculum (school curriculum in-line with the national curriculum). The White Rose Maths curriculum is used for long-term and medium-terms planning. However, teachers can make their own judgements for time constraints and can use other resources alongside the curriculum.
- Teaching and learning should facilitate progression across all key stages within the strands included in this document. Children will have the opportunity to explore and respond to wider investigation such as using statistics around the world to understand trends and patterns.
- Wider Curriculum links and opportunities to explore maths in jobs – Investigations, CCCC opportunities, educational visits and visitors to the school.
- The knowledge and understanding of maths is shown through displays within the learning environment (classrooms, hall and wider school).
- Sharing work with families via the Class Dojo Platform for the children to talk further their understanding at home.
- As well as opportunities underpinned within the scheme of work, children will also spend time further exploring maths in other areas of the school – forest school/beach school.

Impact

- Children will be confident mathematicians and be able to use and apply a wide range of skills across the curriculum.
- Children will have a secure and comprehensive knowledge of maths and how they can apply these to real-life problems.
- Children will be fluent in all areas of maths and be confident of their own ability.
- Children will be enthusiastic about their learning of maths and talk about how it will impact on their lives in the future.
- Children have the flexibility and fluidity to move between different contexts and representations of mathematics.
- Teachers deliver quality teaching and learning throughout the school giving children opportunities they may not have experienced before.