# Mathematics Curriculum

## EYFS to Year 6

# Overarching Principles

## Mathematics

### Subject Vision

At Abingdon, we want all our children to have a love and understanding of mathematics. Our children will leave with the resilience and commitment to be fluent with in the subject and be able to reason and problems solve. Maths at Abingdon enables children to understand and appreciate relationships and patterns in both number and space in their everyday lives. We believe this interconnected discipline should provide a foundation for understanding the world and give children the oracy skills to develop their own individual curiosity. We believe that all children 'Can do' mathematics; therefore, all children can reach a mastery level and succeed. We intend for all children to be secure in the key age related content and reach the expected standards at EYFS, Key Stages 1 and 2, and exceed them where they can. It is our intent that pupils build their learning progressively from year to year.

### Subject Intent

As a school, we follow the National Curriculum for Mathematics supported by the Whiterose scheme of work. The National Curriculum for Maths aims to ensure that all pupils:

- Become fluent in the fundamentals of mathematics through varied and frequent practice with complexity increasing over time.
- Develop conceptual understanding and ability to recall and apply knowledge rapidly and accurately.
- Reason mathematically; follow a line of enquiry, conjecture relationships and generalisations.
- Develop an argument, justification and proof by using mathematical language.
- Problem solve by applying knowledge to a variety of routine and non-routine problems breaking down problems into simpler steps and persevering in answering

## Resources used

We have used the following resources used to support our curriculum to ensure coverage and consistency.

- Whiterose
- NCETM _National Centre for Excellence in the Teaching of Mathematics
- Development Matters
- Master the Curriculum

### Teaching and Learning Overview

| Abingdon Classroom: This is how we do it…. | | |
|---|---|---|
| **Behaviour for learning** | | |
| Positive relationships<br>• Mutual respect<br>• Emotional support | Effective learning environment<br>• Working walls<br>• Celebration of learning | Engaging and relevant curriculum<br>• Inclusive<br>• Diverse |
| **Effective Teaching and Learning** | | |
| Builds on and activates prior knowledge | Questioning | Talk |
| Vocabulary | Feedback | Sequenced steps to enable new learning |
| Modelling | Identifying and addressing misconceptions | Assessment for and of learning |
| Retrieval practice - long term memory | Adapted learning for the needs of individual pupils | Resources – to support, scaffold, challenge |

# Key Subject Specific Teaching Approaches

We follow a mastery approach to the teaching and learning of mathematics. Mastery is a journey and a long-term goal achieved through fluency, reasoning and problem-solving application over time. At each stage of learning, teachers aim to support pupils to demonstrate a deep, conceptual understanding of topics and develop the ability to build on this over time.

The following principles are used to underpin the foundations of mathematics teaching at Abingdon.

- We use the Whiterose scheme of work, following their long-term plan and small step lesson progression
- Children are mostly taught in mixed ability groups however decisions on groupings are made based on the cohort
- Staff use the calculation policy, which supports the Whiterose lessons
- To promote resilience when faced with the unknown and therefore develop a growth mind-set, staff use the 3 B4 Me approach to encourage children to use their book as a learning took and develop commination and mathematical talk with peers
- The expectation is that most pupils will move through the programmes of study at **broadly** the same pace scaffolded by concrete resources where needed. Teachers intend that pupils 'keep up, not catch up'
- Make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems, be curious, explore patterns and explain their reasoning through rich mathematical discussion with their peers
- Maths lessons commence with a Fluency task e.g counting, number bonds, times tables to aim for continuous quick recall
- A **4-a- day** is used as a starter to recap prior learning of arithmetic skills e.g addition, subtraction, multiplication, division and fractions relating to either the current year groups covered units or one from a previous year group
- Vocabulary from the previous year group, for that unit is recapped with new vocabulary explicitly taught and discussed with the class
- To developing understanding of mathematical concepts and the ability to reason mathematically, **stem sentences** are used to support all learners. These are displayed on a working wall or written in books to then being referred to by children
- Before the children complete a task, a **Hinge** question is used as AFL to enable the teacher to ensure all children are ready to complete any independent work. This should be a multiple-choice question to address common misconceptions
- When solving a mathematical problem, children will use the **Bar model** which supports the child moving from the abstract into a familiar mathematical form. They are a visual representation of problems or ideas that can be used for any operations
- Children should develop their relational understanding when problem solving by asking themselves, **"What do I know? What can I workout?"** to break down problems into smaller steps
- The reasoning behind mathematical processes is emphasized. Teacher/pupil interaction explores how answers were obtained as well as why the method worked and what might be the most efficient strategy. Precise mathematical language, often in full sentences, is used by teachers so that mathematical ideas are conveyed with clarity and precision. We value '**mathematical oracy'** and children get lots of opportunity to talk about and evaluate their mathematics during lessons.

**SEND Needs in Mathematics**

- Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through **additional practice**, before moving on.
- Some children may require a 'pre-teach' before a taught objective to ensure that they have the confidence they need to take part in the lesson.
- The learning needs of individuals are addressed through careful scaffolding, questioning and appropriate rapid intervention where necessary, to provide the appropriate support and challenge.
- The concrete, pictorial, abstract approach is used to support SEN children in lessons through scaffolding
- Maths boxes are readily available for all children with concrete resources in for lessons

**More Able Learners**

- Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems and through high-level questions before any acceleration through new content
- Variation is used especially to deepen the understanding of children. This helps to present the mathematics in ways that promote deep, sustainable learning.

# Multiplication Tables

**Teaching and Expectations**

The quick recall of multiplication and division facts (x tables) is an essential skill for children. The ability to instantly recall these facts enables children to answer relative questions with ease. Therefore, it is important that we approach the teaching and testing of times tables in a similar and progressive format from Y2 to Y6. However, we embed counting in steps from EYFS, to enable our children to be times-table ready! Each Year groups 2-4 will teach times tables using the White Rose scheme. All children from year 2 will use Times Table Rock Stars to practise their times tables. In class, they will be taught new times tables and will practise these as homework and using TTRS. Times tables should be part of each mathematics lesson to ensure fluency throughout school. Teachers will also recap previous year group times tables to ensure children remember them.

**End of Year expectations:**

- YR count in 1s up to 20 and beyond
- Y1 count in 1s, 2s, 5s and 10s
- Y2 **teach** 2x, 10x and 5x table.
- Y3 **Recap** 2x, 10x and 5x table.
  **Teach** 3x, 4x and 8x table
- Y4 **Recap** 2x, 10x 5x, 3x, 4x and 8x.
  **Teach** x6, x9, x7, 11x and 12x table – ready for National Times Table Tests (MTC)
- Y5 All x and ÷ facts (up to 12x12)
- Y6 All x and ÷ facts (up to 12x12)

# EYFS

Nursery will follow the Master the Curriculum scheme of work. We believe that educational learning should be fun, engaging and playful. Master the Curriculum provides resources that children will enjoy and most importantly, link to the Early Years Foundation Stage. You'll find a range of resources that also link to the new Development Matters framework and White Rose. The resources from Master the curriculum are aligned with the White Rose Maths framework and the National Curriculum. Each of our resources are designed to help children work towards maths mastery and have fun while doing so.

**Problem Solving**
Through problem-solving lessons and activities, children are encouraged to use their mathematical skills and understanding to solve problems unfamiliar to them.

**Reasoning**
Maths reasoning tasks get children thinking about number problems logically so they can reach conclusions, find solutions and decide which methods to use and why.

**Fluency**
Fluency tasks help children strengthen their foundational knowledge. They practise applying their skills and understanding to different number problems with varying contexts and levels of complexity, while independently choosing the method they use to tackle number problems successfully. Fluency brings together problem-solving and reasoning.

| Term | Nursery Theme |
|---|---|
| Autumn | Colours – red, blue, yellow, green, purple, mix of colours<br>Match – buttons and colours, matching towers, matching shoes<br>Match- number shapes, shape patterns, pattern handprints (big and small)<br>Sort- colour, size, shape<br>Sort- what do you notice? Guess the rule.<br>Number 1 – subitising, counting, numeral<br>Number 2 – subitising<br>Number 2- counting, numeral<br>Pattern |
| Spring | Number 3- Subitising<br>Number 3- 1:1 counting Numerals Triangles<br>Number -4 1:1 counting Numerals Squares/rectangles<br>Number 4- Composition of 4<br>Number 5 -1:1 counting Numerals Pentagon<br>Number 5 -Composition of 5<br>Number 6- Introduce 10 frame<br>Height & Length - Tall and short, Long and short, Tall/long and short<br>Mass<br>Capacity |
| Summer | Sequencing<br>Positional Language<br>More than/fewer than<br>Shape – 2D<br>Shape – 3D<br>What comes after?<br>What comes before?<br>Numbers to 5 |

# Reception

Our reception schemes support you in teaching the key aspects of the EYFS curriculum. The Whiterose scheme supports specific teaching through small steps with adult-led activities and continuous provision. The focus is on building up the numbers slowly, so children gain a deep understanding of them and how they are composed. However, this does not mean children should not be counting and discussing larger numbers in routines such as lining up.

| Term | Reception Theme | |
|---|---|---|
| Autumn | Match, sort and compare<br>Talk about measure and patterns<br>It's me 1, 2, 3<br>Circles and triangles<br>1, 2, 3, 4, 5<br>Shapes with four sides | • Count objects, actions and sounds.<br>• Compare numbers.<br>• Subitise<br>• Link the number symbol (numeral) with its cardinal number value.<br>• Understand the 'one more than/one less than' relationship between consecutive numbers.<br>• Explore the composition of numbers to 10.<br>• Automatically recall number bonds for numbers 0-5 and some to 10.<br>• Continue, copy and create repeating patterns. |
| Spring | Alive in 5<br>Mass and capacity<br>Growing 6, 7, 8<br>Length, height and time<br>Building 9 and 10<br>Explore 3D shapes | • Count objects, actions and sounds.<br>• Compare numbers.<br>• Subitise<br>• Link the number symbol (numeral) with its cardinal number value.<br>• Understand the 'one more than/one less than' relationship between consecutive numbers.<br>• Explore the composition of numbers to 10.<br>• Automatically recall number bonds for numbers 0-5 and some to 10.<br>• Select, rotate and manipulate shapes in order to develop spatial reasoning skills.<br>• Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.<br>• Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.<br>• Continue, copy and create repeating patterns.<br>• Compare length, weight and capacity. |
| Summer | To 20 and beyond<br>How many now?<br>Manipulate, compose and decompose<br>Sharing and grouping<br>Visualise, build and map<br>Make connections | • Count objects, actions and sounds.<br>• Compare numbers.<br>• Count beyond ten.<br>• Subitise<br>• Link the number symbol (numeral) with its cardinal number value.<br>• Understand the 'one more than/one less than' relationship between consecutive numbers.<br>• Explore the composition of numbers to 10.<br>• Automatically recall number bonds for numbers 0-5 and some<br>• to 10.<br>• Select, rotate and manipulate shapes in order to develop spatial reasoning skills.<br>• Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.<br>• Continue, copy and create repeating patterns.<br>• Compare length, weight and capacity. |

# Long Term Map

# Year 1 – 6

| | Autumn | Spring | Summer |
|---|---|---|---|
| Year 1 | Place value within 10<br>Addition and subtraction with in 10<br>Geometry: Shape | Number and place value: within 20<br>Addition and subtraction within 20<br>Number and PV within 50 (multiples of 2 5 and 10 included<br>Measurement: length and height<br>Measurement: weight and volume | Number: Multiplication and division reinforce 2, 5, 10<br>Fractions<br>Geometry: Position and direction<br>Number: PV within 100<br>Measure: Money<br>Measurement: Time |
| Year 2 | Number and PV<br>Number: Addition and subtraction<br>Geometry: Shape | Measurement: Money<br>Number: Multiplication and division<br>Measurement: length and height<br>Measurement: Mass, capacity and temperature | Statistics<br>Number: Fractions<br>Geometry: Position and direction<br>Problem solving and efficient methods<br>Measurement: Time |
| Year 3 | Number and PV<br>Number: Addition and subtraction<br>Number: Multiplication and division | Number: Multiplication and division<br>Measurement: length and perimeter<br>Number: Fractions<br>Measurement: Mass and capacity | Number: Fractions<br>Measurement: Money<br>Measurement: Time<br>Geometry: properties of shape<br>Statistics |
| Year 4 | Number and PV<br>Number: Addition and subtraction<br>Measurement: Area<br>Number: Multiplication and division | Number: Multiplication and division<br>Measurement: length and perimeter<br>Number: Fractions<br>Number: Decimals | Number: Decimals<br>Measurement: Money<br>Measurement: Time<br>Geometry: Properties of shape<br>Statistics<br>Geometry: Position and direction |
| Year 5 | Number and PV<br>Number: Addition and subtraction<br>Number: Multiplication and division<br>Number: Fractions A | Number: Multiplication and division<br>Number: Fractions B<br>Number: Decimals and percentages<br>Measurement: Perimeter and Area<br>Statistics | Geometry: Properties of shapes<br>Geometry: Position and direction.<br>Number Decimals<br>Number: Negative numbers<br>Measurement: Converting units<br>Measurement: Volume |
| Year 6 | Number and PV<br>Number: Addition, subtraction, multiplication and division<br>Number: Fractions A<br>Number: Fractions B<br>Measurement: Converting units | Number: Ratio<br>Number Algebra<br>Number: Decimals<br>Number: Fractions, decimals, percentages<br>Measurement: perimeter, area and volume<br>Statistics | Geometry: Properties of shape<br>Geometry: Position and direction |

# Progression Maps

The progression materials for Year 1 to Year 6 have been taken from The NCETM, for more details visit https://www.ncetm.org.uk/

## Number: Number and Place Value

| COUNTING | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number | | | count backwards through zero to include negative numbers | interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero | use negative numbers in context, and calculate intervals across zero |
| count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens | count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward | count from 0 in multiples of 4, 8, 50 and 100; | count in multiples of 6, 7, 9, 25 and 1000 | count forwards or backwards in steps of powers of 10 for any given number up to 1000 000 | |
| given a number, identify one more and one less | | find 10 or 100 more or less than a given number | find 1000 more or less than a given number | | |
| **COMPARING NUMBERS** | | | | | |
| use the language of: equal to, more than, less than (fewer), most, least | compare and order numbers from 0 up to 100; use <, > and = signs | compare and order numbers up to 1000 | order and compare numbers beyond 1000<br>*compare numbers with the same number of decimal places up to two decimal places* (copied from Fractions) | read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers) | read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers) |
| **IDENTIFYING, REPRESENTING AND ESTIMATING NUMBERS** | | | | | |
| identify and represent numbers using objects and | identify, represent and estimate numbers using different | identify, represent and estimate numbers | identify, represent and estimate numbers | | |

| | | | | | |
|---|---|---|---|---|---|
| pictorial representations including the number line | representations, including the number line | using different representations | using different representations | | |

| **READING AND WRITING NUMBERS** (including Roman Numerals) | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| read and write numbers from 1 to 20 in numerals and words. | read and write numbers to at least 100 in numerals and in words | read and write numbers up to 1 000 in numerals and in words | | read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Comparing Numbers) | read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Understanding Place Value) |
| | | *tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks* (copied from Measurement) | read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value. | read Roman numerals to 1 000 (M) and recognise years written in Roman numerals. | |
| **UNDERSTANDING PLACE VALUE** | | | | | |
| | recognise the place value of each digit in a two-digit number (tens, ones) | recognise the place value of each digit in a three-digit number (hundreds, tens, ones) | recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) | read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers) | read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers) |
| | | | *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 units, tenths and hundredths* (copied from Fractions) | *recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents* (copied from Fractions) | *identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places* (copied from Fractions) |

| ROUNDING | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | | | round any number to the nearest 10, 100 or 1 000 | round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000 | round any whole number to a required degree of accuracy |
| | | | *round decimals with one decimal place to the nearest whole number* (copied from Fractions) | *round decimals with two decimal places to the nearest whole number and to one decimal place* (copied from Fractions) | *solve problems which require answers to be rounded to specified degrees of accuracy* (copied from Fractions) |
| **PROBLEM SOLVING** | | | | | |
| | use place value and number facts to solve problems | solve number problems and practical problems involving these ideas. | solve number and practical problems that involve all of the above and with increasingly large positive numbers | solve number problems and practical problems that involve all of the above | solve number and practical problems that involve all of the above |

# Number: Addition and Subtraction

| NUMBER BONDS | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| represent and use number bonds and related subtraction facts within 20 | recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 | | | | |
| **MENTAL CALCULATION** | | | | | |
| add and subtract one-digit and two-digit numbers to 20, including zero | add and subtract numbers using concrete objects, pictorial representations, and mentally, including:<br>* a two-digit number and ones<br>* a two-digit number and tens<br>* two two-digit numbers | add and subtract numbers mentally, including:<br>* a three-digit number and ones<br>* a three-digit number and tens<br>* a three-digit number and hundreds | | add and subtract numbers mentally with increasingly large numbers | perform mental calculations, including with mixed operations and large numbers |

| | | | | | |
|---|---|---|---|---|---|
| | * adding three one-digit numbers | | | | |
| read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Written Methods) | show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot | | | | use their knowledge of the order of operations to carry out calculations involving the four operations |

| WRITTEN METHODS | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Mental Calculation) | | add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction | add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate | add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) | |
| **INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS** | | | | | |
| | recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. | estimate the answer to a calculation and use inverse operations to check answers | estimate and use inverse operations to check answers to a calculation | use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy | use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy. |

| PROBLEM SOLVING | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| 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:<br>* using concrete objects and pictorial representations, including those involving numbers, quantities and measures<br>* applying their increasing knowledge of mental and written methods | solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction | solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why | solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why | solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why |
| | *solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change* (copied from Measurement) | | | | Solve problems involving addition, subtraction, multiplication and division |

# Number: Multiplication and Division

| MULTIPLICATION & DIVISION FACTS | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| *count in multiples of twos, fives and tens* (copied from Number and Place Value) | *count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward* (copied from Number and Place Value) | *count from 0 in multiples of 4, 8, 50 and 100* (copied from Number and Place Value) | *count in multiples of 6, 7, 9, 25 and 1 000* (copied from Number and Place Value) | *count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000* (copied from Number and Place Value) | |
| | recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers | recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables | recall multiplication and division facts for multiplication tables up to 12 × 12 | | |
| **MENTAL CALCULATION** | | | | | |
| | | write and calculate mathematical statements for multiplication and | use place value, known and derived facts to multiply and | multiply and divide numbers mentally | perform mental calculations, including with mixed operations |

| | | | | | |
|---|---|---|---|---|---|
| | | 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 (appears also in Written Methods) | divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers | drawing upon known facts | and large numbers |
| | show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot | | recognise and use factor pairs and commutativity in mental calculations (appears also in Properties of Numbers) | multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 | *associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^3/_8$)* (copied from Fractions) |

| **WRITTEN CALCULATION** | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs | 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 (appears also in Mental Methods) | multiply two-digit and three-digit numbers by a one-digit number using formal written layout | 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 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 one-digit number using the formal written method of short division and interpret remainders | divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context divide numbers up to 4 |

| | | | | | |
|---|---|---|---|---|---|
| | | | | appropriately for the context | 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 |
| | | | | | *use written division methods in cases where the answer has up to two decimal places* (copied from Fractions (including decimals)) |

| PROPERTIES OF NUMBERS: MULTIPLES, FACTORS, PRIMES, SQUARE AND CUBE NUMBERS | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | | | recognise and use factor pairs and commutativity in mental calculations (repeated) | identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. | identify common factors, common multiples and prime numbers |
| | | | | know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers | *use common factors to simplify fractions; use common multiples to express fractions in the same denomination* (copied from Fractions) |
| | | | | establish whether a number up to 100 is prime and recall prime numbers up to 19 | |
| | | | | recognise and use square numbers and cube numbers, and the notation for squared ($^2$) and cubed ($^3$) | *calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed ($cm^3$) and cubic metres ($m^3$), and extending to other units such as $mm^3$ and $km^3$* |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | (copied from Measures) |

| ORDER OF OPERATIONS | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | | | | | use their knowledge of the order of operations to carry out calculations involving the four operations |
| **INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS** | | | | | |
| | | *estimate the answer to a calculation and use inverse operations to check answers* (copied from Addition and Subtraction) | *estimate and use inverse operations to check answers to a calculation* (copied from Addition and Subtraction) | | use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy |

| PROBLEM SOLVING | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| 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 | solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts | 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 | solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects | solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes | solve problems involving addition, subtraction, multiplication and division |
| | | | | solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding | |

| | | | | | |
|---|---|---|---|---|---|
| | | | | the meaning of the equals sign | |
| | | | | solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates | *solve problems involving similar shapes where the scale factor is known or can be found* (copied from Ratio and Proportion) |

# Number: Fractions (including Decimals and Percentages)

| COUNTING IN FRACTIONAL STEPS | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | *Pupils should count in fractions up to 10, starting from any number and using the1/2 and 2/4 equivalence on the number line (Non Statutory Guidance)* | count up and down in tenths | count up and down in hundredths | | |
| **RECOGNISING FRACTIONS** | | | | | |
| recognise, find and name a half as one of two equal parts of an object, shape or quantity | recognise, find, name and write fractions $^{1}/_{3}$, $^{1}/_{4}$, $^{2}/_{4}$ and $^{3}/_{4}$ of a length, shape, set of objects or quantity | recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators | recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten | recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (appears also in Equivalence) | |
| | | 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 name a quarter as one of four equal parts of an | | recognise and use fractions as numbers: unit fractions and non-unit fractions with | | | |

| | | | | | |
|---|---|---|---|---|---|
| object, shape or quantity | | small denominators | | | |
| **COMPARING FRACTIONS** | | | | | |
| | | compare and order unit fractions, and fractions with the same denominators | | compare and order fractions whose denominators are all multiples of the same number | compare and order fractions, including fractions >1 |

| **COMPARING DECIMALS** | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | | | compare numbers with the same number of decimal places up to two decimal places | read, write, order and compare numbers with up to three decimal places | identify the value of each digit in numbers given to three decimal places |
| **ROUNDING INCLUDING DECIMALS** | | | | | |
| | | | round decimals with one decimal place to the nearest whole number | round decimals with two decimal places to the nearest whole number and to one decimal place | solve problems which require answers to be rounded to specified degrees of accuracy |
| **EQUIVALENCE (INCLUDING FRACTIONS, DECIMALS AND PERCENTAGES)** | | | | | |
| | write simple fractions e.g. $^1/_2$ of 6 = 3 and recognise the equivalence of $^2/_4$ and $^1/_2$. | recognise and show, using diagrams, equivalent fractions with small denominators | recognise and show, using diagrams, families of common equivalent fractions | identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths | use common factors to simplify fractions; use common multiples to express fractions in the same denomination |
| | | | recognise and write decimal equivalents of any number of tenths or hundredths | read and write decimal numbers as fractions (e.g. 0.71 = $^{71}/_{100}$)<br>recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents | associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^3/_8$) |
| | | | recognise and write decimal | recognise the per cent symbol (%) and understand | recall and use equivalences |

| | | | | | |
|---|---|---|---|---|---|
| | | | equivalents to $^1/_4$; $^1/_2$; $^3/_4$ | that per cent relates to "number of parts per hundred", and write percentages as a fraction with denominator 100 as a decimal fraction | between simple fractions, decimals and percentages, including in different contexts. |

| ADDITION AND SUBTRACTION OF FRACTIONS | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | | add and subtract fractions with the same denominator within one whole (e.g. $^5/_7 + ^1/_7 = ^6/_7$) | add and subtract fractions with the same denominator | add and subtract fractions with the same denominator and multiples of the same number | add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions |
| | | | | recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. $^2/_5 + ^4/_5 = ^6/_5 = 1^1/_5$) | |

| MULTIPLICATION AND DIVISION OF FRACTIONS | | | | | |
|---|---|---|---|---|---|
| | | | | multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams | multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $^1/_4 \times ^1/_2 = ^1/_8$) |
| | | | | | multiply one-digit numbers with up to two decimal places by whole numbers |
| | | | | | divide proper fractions by whole numbers (e.g. $^1/_3 \div 2 = ^1/_6$) |

| MULTIPLICATION AND DIVISION OF DECIMALS | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | | | | | multiply one-digit numbers |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | with up to two decimal places by whole numbers |
| | | | 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 | | multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places |
| | | | | | identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places |
| | | | | | associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^{3}/_{8}$) |
| | | | | | use written division methods in cases where the answer has up to two decimal places |
| **PROBLEM SOLVING** | | | | | |
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | | solve problems that involve all of the above | solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non- | solve problems involving numbers up to three decimal places | |

| | | | | | |
|---|---|---|---|---|---|
| | | | unit fractions where the answer is a whole number | | |
| | | | solve simple measure and money problems involving fractions and decimals to two decimal places. | solve problems which require knowing percentage and decimal equivalents of $^{1}/_{2}$, $^{1}/_{4}$, $^{1}/_{5}$, $^{2}/_{5}$, $^{4}/_{5}$ and those with a denominator of a multiple of 10 or 25. | |

## Ratio and Proportion

| **Statements only appear in Year 6 but should be connected to previous learning, particularly fractions and multiplication and division** | | | | | |
|---|---|---|---|---|---|
| | | | | | Year 6 |
| | | | | | solve problems involving the relative sizes of two 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. |

# Algebra

| EQUATIONS | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| *solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and* ***missing number problems*** *such as* *7 = □ - 9* (copied from Addition and Subtraction) | *recognise and use the inverse relationship between addition and subtraction and use this to check calculations and* ***missing number*** *problems.* (copied from Addition and Subtraction) | solve problems, *including* ***missing number*** *problems, using number facts, place value, and more complex addition and subtraction.* (copied from Addition and Subtraction)<br>*solve problems, including* ***missing number*** *problems, involving multiplication and division, including integer scaling* (copied from Multiplication and Division) | | *use the properties of rectangles to deduce related facts and find* ***missing lengths and angles*** (copied from Geometry: Properties of Shapes) | express missing number problems algebraically |
| | *recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100* (copied from Addition and Subtraction) | | | | find pairs of numbers that satisfy number sentences involving two unknowns |
| *represent and use number bonds and related subtraction facts within 20* (copied from Addition and Subtraction) | | | | | enumerate all possibilities of combinations of two variables |

| FORMULAE | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | | | *Perimeter can be expressed algebraically as 2(a + b) where a and b are the dimensions in the same unit. (Copied from NSG measurement)* | | use simple formulae<br>*recognise when it is possible to use* ***formulae*** *for area and volume of shapes* (copied from Measurement) |

| | | | | | |
|---|---|---|---|---|---|
| **SEQUENCES** | | | | | |
| *sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening* (copied from Measurement) | *compare and sequence intervals of time* (copied from Measurement)<br>*order and arrange combinations of mathematical objects in patterns* (copied from Geometry: position and direction) | | | | generate and describe linear number sequences |

# Measurement

| **MEASURING and CALCULATING** | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| recognise and know the value of different denominations of **coins and notes** | recognise and use symbols for pounds **(£) and pence (p)**; combine amounts to make a particular value<br>find different combinations of coins that equal the same amounts of money<br>**solve simple problems** in a practical context involving addition and subtraction of money of the same unit, including giving change | add and subtract amounts of **money** to give change, using both £ and p in practical contexts | | | |
| | | | find the area of rectilinear shapes by counting squares | calculate and compare the area of squares and rectangles including using standard units, square centimetres ($cm^2$) and square metres ($m^2$) and estimate the area of irregular shapes | calculate the area of parallelograms and triangles<br>calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres ($cm^3$) and cubic |

| | | | | | |
|---|---|---|---|---|---|
| | | | | *recognise and use square numbers and cube numbers, and the notation for squared ($^2$) and cubed ($^3$)* (copied from Multiplication and Division) | metres (m$^3$), and extending to other units [e.g. mm$^3$ and km$^3$]. |
| | | | | | recognise when it is possible to use formulae for area and volume of shapes |

| TELLING THE TIME | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. | 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. | tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks | read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting) | | |
| recognise and use language relating to dates, including days of the week, weeks, months and years | know the number of minutes in an hour and the number of hours in a day. (appears also in Converting) | estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight (appears also in Comparing and Estimating) | | | |
| | | | solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days | solve problems involving converting between units of time | |

| | | | | | |
|---|---|---|---|---|---|
| | | | (appears also in Converting) | | |

| CONVERTING | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | know the number of minutes in an hour and the number of hours in a day. (appears also in Telling the Time) | know the number of seconds in a minute and the number of days in each month, year and leap year | convert between different units of measure (e.g. kilometre to metre; hour to minute) | convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) | 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 three decimal places |
| | | | read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting) | solve problems involving converting between units of time | solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate (appears also in Measuring and Calculating) |

| | | | | | |
|---|---|---|---|---|---|
| | | | solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Telling the Time) | understand and use equivalences between metric units and common imperial units such as inches, pounds and pints | convert between miles and kilometres |

# Geometry: Properties of Shapes

<table>
<tr><th colspan="6">IDENTIFYING SHAPES AND THIER PROPERTIES</th></tr>
<tr><th>Year 1</th><th>Year 2</th><th>Year 3</th><th>Year 4</th><th>Year 5</th><th>Year 6</th></tr>
<tr><td rowspan="3">recognise and name common 2-D and 3-D shapes, including:<br>* 2-D shapes [e.g. rectangles (including squares), circles and triangles]<br>* 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres].</td><td>identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line</td><td rowspan="3"></td><td rowspan="3">identify lines of symmetry in 2-D shapes presented in different orientations</td><td rowspan="3">identify 3-D shapes, including cubes and other cuboids, from 2-D representations</td><td>recognise, describe and build simple 3-D shapes, including making nets (appears also in Drawing and Constructing)</td></tr>
<tr><td>identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces</td><td>illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius</td></tr>
<tr><td>identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]</td><td></td></tr>
<tr><th colspan="6">DRAWING AND CONSTRUCTING</th></tr>
</table>

| | | | | | |
|---|---|---|---|---|---|
| | | draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them | complete a simple symmetric figure with respect to a specific line of symmetry | draw given angles, and measure them in degrees ($^{o}$) | draw 2-D shapes using given dimensions and angles<br>recognise, describe and build simple 3-D shapes, including making nets (appears also in Identifying Shapes and Their Properties) |

| COMPARING AND CLASSIFYING | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | compare and sort common 2-D and 3-D shapes and everyday objects | | compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes | use the properties of rectangles to deduce related facts and find missing lengths and angles<br>distinguish between regular and irregular polygons based on reasoning about equal sides and angles | compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons |
| **ANGLES** | | | | | |
| | | recognise angles as a property of shape or a description of a turn | | know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles | |
| | | identify right angles, recognise that two right angles make a half-turn, three make three quarters of a | identify acute and obtuse angles and compare and order angles up | identify:<br>* angles at a point and one whole turn (total 360$^{o}$) | recognise angles where they meet at a point, are on a straight line, or are vertically opposite, |

| | | | | | |
|---|---|---|---|---|---|
| | | turn and four a complete turn; identify whether angles are greater than or less than a right angle | to two right angles by size | * angles at a point on a straight line and ½ a turn (total 180°)<br>* other multiples of 90° | and find missing angles |
| | | identify horizontal and vertical lines and pairs of perpendicular and parallel lines | | | |

## Geometry: Position and Direction

| POSITION, DIRECTION AND MOVEMENT | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| describe position, direction and movement, including half, quarter and three-quarter turns. | 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) | | describe positions on a 2-D grid as coordinates in the first quadrant | 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 four quadrants) |
| | | | describe movements between positions as translations of a given unit to the left/right and up/down | | draw and translate simple shapes on the coordinate plane, and reflect them in the axes. |
| | | | plot specified points and draw sides to complete a given polygon | | |
| **PATTERN** | | | | | |
| | order and arrange combinations of mathematical objects in patterns and sequences | | | | |

## Statistics

| INTERPRETING, CONSTRUCTING AND PRESENTING DATA | | | | | |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | interpret and construct simple | interpret and present data | interpret and present discrete | complete, read and interpret | interpret and construct pie |

| | | | | | |
|---|---|---|---|---|---|
| | pictograms, tally charts, block diagrams and simple tables | using bar charts, pictograms and tables | and continuous data using appropriate graphical methods, including bar charts and time graphs | information in tables, including timetables | charts and line graphs and use these to solve problems |
| | 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 | | | | |
| **SOLVING PROBLEMS** | | | | | |
| | | solve one-step and two-step questions [e.g. 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables. | 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 | calculate and interpret the mean as an average |

# Key Vocabulary

Mathematics Vocabulary Progression document (YR-Y6) This document is designed to assist with the teaching of vocabulary across EYFS, KS1 and KS2 and is aligned with the White Rose schemes of learning. This document identifies in which year group vocabulary should be **explicitly taught** and introduced. However, language should be revisited in subsequent year groups to ensure children are consolidating their understanding. This is a working document and will be updated as required. Some vocabulary might be introduced earlier (shapes for instance) if necessary or as part of an activity, however this document ensures coverage is progressive.

| Number - Number and Place Value | | | | | | |
|---|---|---|---|---|---|---|
| Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| count | sort | count in steps | ascending | negative numbers | ten thousands | millions |
| subitise | represent | count in multiples | descending | roman numerals | one hundred thousands | ten millions |
| order/ordinal | multiples | place value | 10 or 100 more | 1000 more | powers of | |
| compare | partitioning | estimate | 10 or 100 less | 1000 less | Integer | |
| forwards | ones | compare | hundreds | thousands | | |
| backwards | tens | | | round | | |
| numerals | | | | | | |
| digit | | | | | | |
| one more | | | | | | |
| one less | | | | | | |
| equal to | | | | | | |
| more than | | | | | | |
| less than (fewer) | | | | | | |

| Addition and Subtraction | | | | | | |
|---|---|---|---|---|---|---|
| Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| add | addition/add | sum | column addition | 4-digit number | | |
| plus | subtraction | 3-digit number | column subtraction | operations | | |
| altogether | difference | commutative | exchange | methods | | |
| total | equals | | estimate | | | |
| take away / minus | facts | | | | | |
| number bonds | problems | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| part | missing number problems | | | | | |
| whole | 2-digit number digit | | | | | |
| digit | inverse | | | | | |

| Multiplication and Division | | | | | | |
|---|---|---|---|---|---|---|
| Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| double | multiplication | multiplication tables | exchange | factor pairs | prime numbers | multi-digit numbers |
| half | division | commutative | mathematical statements | formal written | square numbers | long division |
| twice as many | arrays | repeated addition | missing numbers | distributive law | cube numbers | |
| equal | | | integer | remainders | short division | |
| unequal | | | multiples | | dividend | |
| share | | | factors | | divisor | |
| group | | | | | operations | |
| odd | | | | | | |
| even | | | | | | |

| Fractions, Decimals and Percentages | | | | | | |
|---|---|---|---|---|---|---|
| Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | whole | three quarters | tenths | decimal equivalents | fifth | |
| | half | third | | hundredths | thousandths | |
| | quarters | equivalent fractions | | convert | mixed numbers | |
| | equal parts | unit fractions | | proper fractions | per cent % | |
| | | Non- unit fractions | | improper fractions | factors | |
| | | numerators | | decimal point | integer | |
| | | denominators | | | complements | |
| | | one whole | | | | |

| Ratio and Proportion | | | | | | |
|---|---|---|---|---|---|---|
| Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | | | | | | relative size |
| | | | | | | missing values |
| | | | | | | integer multiplication |
| | | | | | | percentages |
| | | | | | | scale factor |
| | | | | | | unequal sharing |
| | | | | | | |

| Algebra | | | | | | |
|---|---|---|---|---|---|---|
| Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | | | | | | formulae |
| | | | | | | linear number sequence |
| | | | | | | algebraically |
| | | | | | | equation |
| | | | | | | unknowns |
| | | | | | | combinations |
| | | | | | | variables |

| Measurement (Length) | | | | | | |
|---|---|---|---|---|---|---|
| Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| measure | compare | standard units | millimetre mm | kilometres km | decimal notation | conversion |
| wide(er) | | estimate | perimeter | rectilinear figure | scaling | miles |
| narrow(er) | | order | | area | metric units | formulae |
| compare | | record results | | | imperial units | parallelogram |
| long(er) (est) | | centimetres cm | | | inches | triangles |
| short (er) (est) | | metre m | | | compound shape | feet |
| length | | | | | irregular/ regular shape | |
| | | | | | square centimetres | |
| | | | | | square metres | |

| Measurement (Height, Weight and Capacity) | | | | | | |
|---|---|---|---|---|---|---|
| Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Height | mass | kilogram kg | | | cubic centimetres | cubic metres |
| long(er)/short(er) | volume | gram g | | | pounds | cubic millimetres |
| tall(er)/short(er) | | quarter full | | | pints | cubic kilometres |
| Weight | | three quarter full | | | | gallons |
| Capacity | | litres l | | | | stones |
| heavy / light | | millimetres ml | | | | pounds |
| heavier than | | temperature | | | | |
| lighter than | | celsius | | | | |
| big bigger biggest | | | | | | |
| full empty | | | | | | |
| more than | | | | | | |
| less than | | | | | | |
| half/ half full | | | | | | |

| Measurement (Time) | | | | | | |
|---|---|---|---|---|---|---|
| Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| time | chronological order | intervals of time | analogue clock | convert | | |
| quicker | days of the week | quarter past / to | roman numerals | timetable | | |
| slower | months of the year | duration | 12-clock | | | |
| earlier | month | | 24-hour clock | | | |
| later | year | | a.m / p.m | | | |
| before | o'clock | | noon | | | |
| after | half past | | midnight | | | |
| first | second | | leap year | | | |
| next | | | digital | | | |
| today | | | | | | |
| yesterday | | | | | | |
| tomorrow | | | | | | |
| morning | | | | | | |
| afternoon | | | | | | |
| evening | | | | | | |
| day | | | | | | |
| week | | | | | | |
| hour | | | | | | |
| minutes | | | | | | |

| Measurement (Money) | | | | | | |
|---|---|---|---|---|---|---|
| Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | money | value | | | | |
| | coins | change | | | | |
| | notes | | | | | |
| | pound £ | | | | | |
| | pence p | | | | | |

| Geometry – Properties of Shape | | | | | | |
|---|---|---|---|---|---|---|
| Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| 2-d shapes | sides | pentagon | right-angles triangle | isosceles | regular polygon | radius |
| rectangle | corners | hexagon | heptagon | equilateral | irregular polygon | diameter |
| square | properties | lines of symmetry | octagon | scalene | | circumference |
| circle | pyramids | properties | polygon | trapezium | | dimensions |
| triangles | faces | cylinder | properties | rhombus | | |
| characteristics | | edges | prism | parallelogram | | |
| 3-d shape | | vertices | | kite | | |
| cuboids | | vertex | | geometric shape | | |
| cubes | | | | quadrilaterals | | |
| cones | | | | | | |
| spheres | | | | | | |
| curved | | | | | | |
| straight | | | | | | |
| flat | | | | | | |

| Geometry – Properties of shape | | | | | | |
|---|---|---|---|---|---|---|
| Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | | | orientation | | reflex angle | intersect |
| | | | angles | | degrees | |
| | | | acute | | one whole turn | |
| | | | obtuse | | angles on a straight line | |
| | | | turn | | angles around a point | |
| | | | right angle | | vertically opposite angles | |
| | | | half turn | | missing angles | |
| | | | three quarter turn | | | |
| | | | greater than a right angle | | | |
| | | | less than a right angle | | | |
| | | | horizontal line | | | |
| | | | vertical lines | | | |
| | | | perpendicular lines | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | diagonal lines | | | |

| Geometry – Position direction | | | | | | |
|---|---|---|---|---|---|---|
| Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| over | position | clockwise/ anticlockwise | | co-ordinates | reflection | four quadrant co-ordination plane |
| under | direction | straight line | | first quadrant | | |
| between | movement | rotation | | grid | | |
| around | whole turn | arrange | | translation | | |
| through | quarter turn | sequences | | plot | | |
| on | half term | | | polygon | | |
| into | three-quarter turn | | | axis | | |
| next to | | | | | | |
| behind | | | | | | |
| beneath | | | | | | |
| order | | | | | | |
| repeat | | | | | | |
| patterns | | | | | | |
| on top of | | | | | | |

| Statistics | | | | | | |
|---|---|---|---|---|---|---|
| Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| | | pictograms | table | time graph | time table | pie chart |
| | | tally chart | bar chart | discrete data | two-way table | mean |
| | | block diagram | one-step problem | continuous data | | |
| | | category | two-step problem | line graph | | |
| | | sorting | | comparison problem | | |
| | | totalling | | sum problem | | |
| | | comparing | | difference problem | | |
| | | horizontal | | calculate | | |
| | | vertical | | interpret | | |

# Mathematics Stem Sentence

This sets out year group maths Stem Sentences under the new National Curriculum. The sentences should be used when planning most lessons and repeated daily with the children for the correlating unit.

The lists are intended as a guide as to what pupils should be repeating and taught. They are not exhaustive and if you feel you need to add more then please do so.

| Year 1 | |
|---|---|
| Place Value | **Counting (forwards and backwards)**<br>Counting forwards, the numbers get bigger.<br>Counting backwards, the numbers get smaller.<br><br>**Reading and writing numbers in words and numerals**<br>18 is 18 ones.<br>18 is 1 ten and 8 ones.<br><br>**Representing numbers with a range of objects and pictures**<br>There are _____ _____. There are seven ducks.. (change numbers and objects)<br>_____ has more.<br>____ has less. |
| Addition and Subtraction | **Number bonds**<br>__ is made up of ____ ones and ___ tens.<br><br>**Read and write mathematical statements**<br>Eight add eight equals 16. (change numbers and objects)<br><br>**Add and subtract numbers to 20**<br>Adding can be done in any order.<br>When subtracting, the biggest number comes first.<br><br>**Solve addition and subtraction problems using objects and pictures**<br>_____ add ____ equals _____.<br>_____ subtract ____ equals _____.<br>This is more.<br>This is less. |
| Geometry- Shape | **Recognise and name common 2D and 3D shapes**<br>A 2D shape is flat.<br>A 3D shape stands up.<br>**Recognise and name common 2D and 3D shapes**<br>A 2D shape is flat.<br>A 3D shape stands up.<br>**Begin to describe the properties**<br>A squares sides are all the same.<br>A rectangle has two pairs of equal sides.<br>A circle has a curved side.<br>A triangle has three sides. |
| Measure – Length and height Mass and Volume | **Compare, describe, measure, begin to record and solve practical problems involving lengths, masses, capacity and time.**<br>Capacity is the amount a container can hold.<br>Mass is how heavy something is.<br>Length is the distance from end to end of an object.<br>**Make and begin to record measurements**<br>_____ is longer.<br>_____ is shorter.<br>_____ is heavier.<br>_____ is lighter. |

| | |
|---|---|
| Multiplication and division | **Solve simple multiplication problems, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher**<br>Multiply means lots of.<br>When we multiply the answer gets bigger.<br>I have ___ groups of ____.<br>I have ___ equal groups of ___.<br>Dividing means to share.<br>There are ____ groups. |
| Fractions | **Recognise, find and name a half and a quarter of an object, shape or quantity**<br>A half, cuts the shape/object in two.<br>A quarter cuts the shape/objects in four.<br>**Represent half and quarter using different objects and pictures.**<br>A half, cuts the shape/object in two.<br>A quarter cuts the shape/objects in four.<br>A fraction is an equal part of a whole. |
| Geometry- Position and Direction | **Describe position, direction and movement**<br>The ____ is on top of ____.<br>The ___ is below_____.<br>**Describe whole, half, quarter and three-quarter turn**<br>Half turn means you or the object will face the opposite way.<br>A whole turn means the object faces the same way. |
| Measure – Money<br>Time | **Recognise and know the value of money**<br>This is a ____ p coin. It is worth ____ p.<br>This is a £ ___ coin. It is worth £___.<br>____ and ___ coin totals ___.<br>These have the same value as _____.<br><br>**Sequence events**<br>_____ comes first.<br>**Use the language of dates**<br>Tomorrow will be_____.<br>Yesterday was _____.<br>**Tell/show the time to the hour and half hour**<br>The time is _____<br>When the big hand is on the 12, it is 12 o'clock. |

## Year 2

| | |
|---|---|
| Place Value | **Reading and writing numbers in words and numerals to 100**<br>Zero is the digit 0, which stands for no amount.<br>**Recognise place value**<br>There are ten ones in a ten.<br>There are one hundred ones in a hundred.<br>There are ten tens in a hundred.<br>98 is 98 ones. 98 is 9 tens and 8 ones.<br>**Compare and order numbers**<br>The widest part of the < and > sign always points to the larger number.<br>**Counting in 2s, 3s and 5s (recall and use times table facts for these)**<br>It increases by ___ each time.<br>**Arrange patterns**<br>I notice that the ___ changes . |

| | |
|---|---|
| | I noticed that ___ stayed the same.<br>I know ____ will be next because _____.<br>**Recognise odd and even numbers**<br>If the total of the ones column is equal to 10 or more then I must exchange.<br>When adding or subtracting tens, the ones digit remains the same. |
| Addition and Subtraction | **Recall addition and subtraction facts to 20 and derive them to 100**<br>I know that 5+4=9 so I now that 5 tens + 4 tens = 9 tens so I know that 50+40=90.<br>I know that 8-6=2 so I know that 8 tens—6 tens =2 tens so I know that 80- 60=20.<br>**Add and subtract numbers using objects and pictures up to 2d+2d**<br>___ add ___ is equal to ___.<br>**Show commutativity of addition (and non-commutativity of subtraction)**<br>Addition can be done in any order.<br>Subtraction cannot be done in any order.<br>**Solve addition and subtraction problems with 2-digit numbers**<br>___ add ___ is equal to ___.<br>**Solving missing number problems using inverse**<br>The inverse would be____.<br>Inverse means the opposite.<br>The opposite of _____ is _____. |
| Geometry- Shape | **Identify and describe properties of 2D and 3D shapes**<br>2D shapes have sides and corners/ vertices<br>3D shapes have faces, edges and vertices.<br>A side is the line between 2 vertices.<br>A corner/vertex is the point where 2 sides meet.<br>An edge is where 2 faces meet.<br>A vertex is where 2 or more edges meet.<br>If something is symmetrical it can be divided into 2 matching half shapes.<br>**Identify 2D shapes on the surface of 3D shapes**<br>A cube is made up of 6 squares.<br>_____ is made up of ____ ___. |
| Measure- Money | **Use £ and p symbols**<br>There are 100p in £1.<br>**Find combinations of coins for a given total**<br>____ (£ or p) add ____ (£ or p) equals ____.<br>**Solve simple addition and subtraction problems using money**<br>____ (£ or p) add ____ (£ or p) equals ____. |
| Multiplication and division | **Solving missing number problems using inverse**<br>The inverse would be____.<br>Inverse means the opposite.<br>The opposite of _____ is _____.<br>**Calculate and write mathematical statements for multiplication and division**<br>The groups are equal because there are the same number of objects in each group.<br>The groups are unequal because there are a different number of objects in each group.<br>There are 2 + 2 + 2 so we can write this as 2 x 3.<br>**Show commutativity of multiplication (and non-commutativity of division)**<br>We can write 2 x 3 as 3 x2 and it is the same answer. ( change the numbers for others)<br>There are ___ equal groups of ____.<br>There are ___ in each group.<br>There are ___ groups of ____.<br>**Calculate and write mathematical statements for multiplication and division**<br>The groups are equal because there are the same number of objects in each group.<br>The groups are unequal because there are a different number of objects in each group.<br>There are 2 + 2 + 2 so we can write this as 2 x 3.<br>**Show commutativity of multiplication (and non-commutativity of division)**<br>We can write 2 x 3 as 3 x2 and it is the same answer. ( change the numbers for others)<br>There are ___ equal groups of ____<br>There are ___ in each group.<br>There are ___ groups of ____. |

| | |
|---|---|
| Measure – Length and height Mass and Volume Temperature | **Choose and use suitable units; compare and order lengths, masses and capacities**<br>Capacity is the amount a container can hold.<br>Mass is how heavy something is.<br>Length is the distance from end to end of an object.<br>_____ is longer than _____.<br>___ is heavier than ____. |
| Fractions | **Recognise, find and name 1/3, ., 2/4, . of a length, shape, set of objects or quantity**<br>A fraction is an equal part of a whole.<br>A part is smaller than the whole.<br>The whole has been divided into __ equal parts.<br>**Write simple fractions and recognise equivalence of 2/4 and ½**<br>$^{2}/_{4}$ is the same as ½.<br>Halving is the same as dividing by 2.<br>A quarter is half of a half. |
| Measure – Time | **Sequence time intervals**<br>____ is before _____.<br>___ is after _____.<br>**Know number of minutes in an hour and hours in a day**<br>There are 24 hours in 1 day.<br>There are 60 minutes in 1 hour. |
| Statistics | **Interpret and construct simple pictograms, tally charts, block diagrams and tables**<br>**Count, sort, total and compare categorical data**<br>Each symbol represents 2 so half a symbol represents 1. (pictograms)<br>The total is _____.<br>___ has a bigger value.<br>____ has less value. |
| Geometry- Position and Direction | **Describe position, direction and movement using mathematical language, distinguishing between straight line movement and rotation**<br>Half turn means you or the object will face the opposite way.<br>If something moves clockwise it goes around to the right, like the hands of a clock.<br>If something moves anticlockwise it goes around to the left. |

## Year 3

| | |
|---|---|
| Place Value | **Read and write numbers to 1000 in words and numerals**<br>There are ten tens in a hundred.<br>There are one hundred ones in one hundred.<br>There are ten one hundreds in one thousand.<br>**Recognise place vale up to 3 digits**<br>342 is 342 ones.<br>342 is 3 hundreds and 42 ones<br>342 is 34 tens and 2 ones<br>342 is 3 hundreds, 4 tens and 2 ones.<br>**Compare and order numbers up to 1000**<br>___ is greater than _____.<br>**Count in multiples of 4, 8, 50 and 100**<br>I notice that _____.<br>**Find 10 or 100 more or less than a given number**<br>Ten more than ___ is___.<br>Ten less than ___ is ____.<br>One hundred more than ___ is ____.<br>One hundred less than ___ is ____. |
| Addition and Subtraction | **Add and subtract mentally up to 3 digits plus ones, or tens or hundreds**<br>The ___ column will change.<br>The ____column will stay the same. |

| | |
|---|---|
| | I know that 6 + 7 = 13 so I know 6 tens + 7 tens = 13 tens so I know 60 + 70 = 130.<br>I know 13—6 = 7 so I know 13 tens—6 tens = 7 tens so I know 130—60 = 70.<br>**Add and subtract up to 3d using formal methods**<br>In column addition, we start at the right hand side.<br>If the column sum is equal to 10 or more then we must regroup.<br>If there isn't enough to subtract from, then we must exchange.<br>We take one and make ___.<br>**Estimate answers and use inverse operations to check a calculation**<br>The inverse would be____.<br>Inverse means the opposite.<br>The opposite of _____ is _____.<br>**Revisit mental addition and subtraction (3d + 1s or 10s or 100s) and formal methods of calculation for addition and subtraction up to 3d**<br>In column addition, we start at the right hand side.<br>If the column sum is equal to 10 or more then we must regroup.<br>Subtraction cannot be done in any order.<br>When using column subtraction, if the digit on the top is lower than that of the digit on the bottom then exchange.<br>**Solve problems using addition and subtraction including missing number problems, number facts, place value etc.**<br>For calculations that involve both + and - steps, we can + then-or-then +; the final answer is the same. |
| Multiplication and division | **Estimate answers and use inverse operations to check a calculation**<br>The inverse would be____.<br>Inverse means the opposite.<br>The opposite of _____ is _____.<br>**Write statements for multiplication and division using times tables, including up to 2d x 1d.**<br>When 0 is a factor, the product is 0.<br>Find factors in pairs by multiplying e.g. find factors of 20: 1 and 20, 2 and 10, 4 and 5 etc<br>Products in the 4 times table are also in the 2 times table.<br>3 x 4 is double 3 x 2.'<br>**Solve problems involving multiplication and division including missing numbers, scaling and correspondence problems.**<br>To find the missing number we need to do the inverse.<br>The inverse means the opposite.<br>The opposite of _____ is ____. |
| Measure-Length and Perimeter | **Measure perimeter of simple 2D shapes**<br>Perimeter is the distance around the outside of a 2D shape. |
| Fractions | **Recognise, find and write fractions of a discrete set of objects**<br>A fraction is an equal part of a whole.<br>If _ is the whole then _is a part of the whole.<br>A part is smaller than the whole.<br>**Recognise and use fractions as numbers**<br>The whole has been divided into _ equal/unequal parts.<br>Equal parts do not have to look the same.<br>**Compare and order unit fractions**<br>A unit fraction always has a numerator of 1.<br>A non-unit fraction has a numerator that is greater than 1.<br>An example of a unit fraction is_.<br>An example of a non unit fraction is_.<br>As the denominator increases, the parts become smaller.<br>**Compare and order fractions with the same denominator**<br>If the denominator is the same, we need to use the numerator.<br>**Recognise and show equivalent fractions**<br>____ (£ or p) add ____ (£ or p) equals ____.<br>**Add and subtract fractions with same denominator within one whole**<br>When a fraction is equal to a whole, the numerator and the denominator are the same.<br>When the denominator is the same, we just add the numerators. |

| | |
|---|---|
| Measure – Mass and Volume | **Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)**<br>Kilo means 1000.<br>There are 1000g in 1kg.<br>There are 10mm in 1cm.<br>Capacity is the amount a container can hold.<br>Mass is how heavy something is.<br>Length is the distance from end to end of an object.<br>_____ is longer than _____.<br>___ is heavier than ____. |
| Measure – Money | **Add and subtract money in practical contexts to give change etc.**<br>There are 100p in £1.<br>____ (£ or p) add ____ (£ or p) equals ____.<br>____ (£ or p) subtract ____ (£ or p) equals ____.<br>Change is how much money is given back to me. |
| Measure- Time | **Tell and show the time to nearest minute using analogue and digital clocks, using 12 and 24 hours**<br>The time is _____.<br>**Know number of seconds in a minute, number of days in each month, year and leap year**<br>There are 60 seconds in 1 minute.<br>There are 60 minutes in 1 hour.<br>A leap year occurs every 4 years and has 366 days.<br>**Compare durations of events**<br>A.M. is any time in the morning from midnight to noon.<br>P.M. is any time after midday from noon to midnight.<br>_____ is longer.<br>_____ is shorter. |
| Geometry- Shape | **Identify pairs of parallel or perpendicular lines**<br>Parallel lines are lines that never meet and are an equal distance apart.<br>Perpendicular lines meet at a right angle.<br>**Recognise angles in shapes or as turns**<br>4 right angles make a full turn.<br>2 right angles is half a full turn.<br>**Identify right angles**<br>A right angle is 90°.<br>**Recognise multiples of right angles**<br>If one right angle is 90°, then two are ____.<br>**Draw 2D shapes and make 3D shapes**<br>A cube is made up of 6 squares.<br>2D shapes are completely flat.<br>**Recognise 3D shapes in various orientations and describe them**<br>_____ is made up of ____ ___. |
| Statistics | **Interpret and construct simple tally charts, pictograms, block diagrams and tables**<br>The symbol in the key represents _so half a symbol represents_.<br>**Ask and answer questions by totalling and comparing data**<br>The total is _____.<br>___ has a bigger value.<br>____ has less value. |

# Year 4

| | |
|---|---|
| Place Value | **Recognise place vale up to 4 digits**<br>There are ten hundreds in one thousand<br>There are one hundred tens in one thousand.<br>There are one thousand ones in one thousand.<br>The ___ represents ____.<br>The value of the ____ is ____.<br>**Round to the nearest 10, 100 and 1000**<br>When rounding to the nearest___, if the _____digit is 4 or less, round down. If the ____ digit is 5 or more than round up.<br>**Order and compare numbers beyond 1000**<br>5342 is 5342 ones.<br>5342 is 5 thousands and 342 ones<br>5342 is 53 hundreds and 42 ones<br>5342 is 534 tens and 2 ones<br>5342 is 5 thousands, 3 hundreds, 4 tens and 2 ones.<br>____ is greater than/less than because the ____ digit is bigger/smaller.<br>**Find 1000 more or less than a given number**<br>1000 more than ____ is _____.<br>1000 less than ____ is _____. |
| Addition and Subtraction | **Add and subtract up to 4d using formal methods where appropriate**<br>In column addition, we start at the right hand side.<br>If the column sum is equal to 10 or more then we must regroup.<br>Subtraction cannot be done in any order.<br>When using column subtraction, if the digit on the top is lower than that of the digit on the bottom then exchange.<br>**Use inverse operations to check a calculation**<br>The inverse would be____.<br>Inverse means the opposite.<br>The opposite of _____ is _____.<br>**Solve addition and subtraction 2-step problems**<br>For calculations that involve both + and - steps, we can + then-or-then +; the final answer is the same.<br>**Mental Addition and subtraction**<br>I know that 6 tens + 7 tens = 13 tens/130 so I know that 6 hundreds + 7 hundreds = 13 hundreds/1300.<br>I know that 13—6 = 7 so I know that 130 - 60 = 70 and 1300 - 600=700. |
| Measurement- Area | **Area of rectilinear shapes by counting**<br>Area is the amount of space a shape covers and is measured in squared units. |
| Multiplication and division | **Count in multiples of 6, 7, 9, 25 and 1000**<br>The ____ digit will change.<br>The ____ digit will stay the same.<br>**Use factor pairs and commutativity in mental calculations**<br>A *factor* is a number that divides into another number exactly and without leaving a remainder.<br>When multiplying, the numbers can be any way round and the answer will be the same.<br>____ is a factor is ____.<br>**Multiply 2dx1d or 3dx1d using a formal written layout**<br>_____ times ____ is____ .<br>**Multiply and divide mentally using place value and known facts etc to help**<br>When a number is multiplied by 0, the answer is always 0.<br>When a number is multiplied by 1, the number remains the same.<br>When a number is divided by 1, the number remains the same.<br>When a number is divided by itself, the answer is always 1.<br>**Use inverse operations to check a calculation**<br>The inverse would be____.<br>Inverse means the opposite. |

| | |
|---|---|
| | The opposite of _____ is _____.<br>**Recap mental multiplication skills**<br>When a number is multiplied by 0, the answer is always 0.<br>When a number is multiplied by 1, the number remains the same.<br>When a number is divided by 1, the number remains the same.<br>When a number is divided by itself, the answer is always 1.<br>**Recap formal multiplication**<br>_____ times ____ is____ .<br>If there are ten or more ones, we must regroup into tens and ones.<br>If there are ten or more tens, we must regroup into hundreds and tens. |
| Measure- Length and Perimeter | **Perimeter of rectilinear shapes**<br>Perimeter is the distance around the outside of a 2D shape. |
| Fractions | **Recognise and show equivalent families of fractions**<br>Equivalent means equal or the same.<br>_____ is equivalent to____.<br>A fraction is an equal part of a whole.<br>**Count in tenths**<br>1 whole is ten tenths.<br>**Recognise tenths from dividing an object into 10 equal pieces and dividing a number by 10**<br>1 whole is ten tenths.<br>I know $\frac{}{10}$ is the same as __÷ 10.<br>**Add and subtract fractions with same denominator**<br>When adding fractions, add the parts and keep the denominator the same.<br>Add the wholes then add the parts.<br>A fraction is an equal part of a whole.<br>**Solve problems involving fractions to calculate quantities, including non-unit fractions**<br>As the denominator increases, the parts become smaller. |
| Decimals | **Recognise and write decimal equivalents of any number of tenths or hundredth**<br>A decimal is part of a whole.<br>1 whole is ten tenths or a hundred hundredths.<br>The decimal equivalent of _____ is ____.<br>The 10ths column is to the right of the decimal point.<br>The $100^{th}$ column is to the right of the 10ths.<br>**Recognise and write decimal equivalents to ___.**<br>____ is equivalent to _____<br>**Order and compare decimals to 2d**<br>____ has a higher value because of the ___ column.<br>**Round decimals to the nearest integer**<br>When rounding to the nearest whole, if the tenths digit is less than 4, round down. If the tenths digit is 5 or above, round up.<br>**Divide a (1 or 2d) number by 10 and 100**<br>When we divide by 10, the digits move one place to the right.<br>When we divide by 100, the digits move two places to the right. |
| Measure – Money | **Estimate, calculate and compare money in £ and p**<br>There are 100p in £1.<br>____ (£ or p) add ____ (£ or p) equals ____.<br>____ (£ or p) subtract ____ (£ or p) equals ____.<br>Change is how much money is given back to me. |
| Measure- Time | **Read, write and convert time between 12 and 24 hour clocks (analogue and digital)**<br>A.M. is any time in the morning from midnight to noon.<br>P.M. is any time after midday from noon to midnight.<br>**Solve problems converting between units of time**<br>There are 60 seconds in 1 minute and 60 minutes in 1 hour. |

| | |
|---|---|
| | A leap year occurs every 4 years and has 366 days.<br>Add 12 hours to a 12-hour clock p.m. time to get the equivalent 24-hour clock time. |
| Geometry-Shape | **Complete a simple symmetric figure**<br>If something is symmetrical it can be divided into 2 matching half shapes.<br>Symmetrical means the same on both sides.<br>Parallel lines are lines that never meet and are an equal distance apart.<br>Perpendicular lines meet at a right angle.<br>**Identify lines of symmetry**<br>If something is symmetrical it can be divided into 2 matching half shapes.<br>**Identify acute and obtuse angles**<br>A right angle is 90°.<br>An acute angle is less than 90°.<br>An obtuse angle is more than 90° but less than 180°.<br>**Compare and order angles up to 180 degrees**<br>If one right angle is 90°, then two are ____.<br>____ is smaller than ____.<br>____ is greater than _____.<br>____ is an ____ angle because it measures ____.<br>**Compare and classify geometric shapes, including triangles and quadrilaterals.**<br>A triangle is a 3 sided 2D shape.<br>_____ is a _____ because it has _____.<br>A quadrilateral is a 2D 4 sided shape.<br>A polygon is a shape that is bound with straight lines. |
| Statistics | **Interpret and present data appropriately including bar charts and time graphs**<br>The total of ____is _____.<br>___ has a bigger value.<br>____ has less value.<br>**Solve problems from bar charts, pictograms, tables etc**<br>The symbol in the key represents _so half a symbol represents_.<br>The symbol in the key represents _so quarter of a symbol represents_. |
| Geometry-Position and Direction | **Describe positions on grid in first quadrant as coordinates**<br>When we read coordinates, we read x and then y.<br>**Describe movements between positions as translations using up/down and left/right**<br>Translation moves a shape by sliding it.<br>The shape doesn't change size or shape.<br>The shape has moved ____point left/right and _____ up/down.<br>**Plot specified points and complete to make a polygon**<br>When we read coordinates, we read x and then y.<br>A polygon is a 2D shape that has straight sides. |

## Year 5

| | |
|---|---|
| Place Value | **Read, write, compare and order numbers up to 1 000 000**<br>There are ten thousands in a ten thousand.<br>There are ten, ten thousands in a hundred thousand.<br>There are ten hundred thousands in a million.<br>4,321,000 is 4 millions and 321 thousands;<br>4,321,000 is 43 hundred thousands and 21 thousands etc.<br>The ___ represents ____.<br>The value of the ____ is ____.<br>**Round integers to powers of 10, round decimals to 2dp, order decimals to 3dp**<br>When rounding to the nearest___, if the _____digit is 4 or less, round down. If the ____ digit is 5 or more than round up. |

| | |
|---|---|
| Addition and Subtraction | **Add and subtract numbers mentally**<br>I know that 6 hundreds + 7 hundreds= 13 hundreds/1300 so I know that 6 thousands + 7 thousands= 13 thousands/13,000.<br>I know that 13—6 = 7 so I know that 130 - 60 = 70 and 1300 - 600=700.<br>**Formal addition and subtraction up to 4d**<br>In column addition/subtraction, we start at the right hand side.<br>If the column sum is equal to 10 or more then we must regroup.<br>Subtraction cannot be done in any order.<br>When using column subtraction, if the digit on the top is lower in value than that of the digit on the bottom then exchange.<br>**Solve addition and subtraction multi-step problems in context**<br>For calculations that involve both + and - steps, we can + then-or-then +; the final answer is the same. |
| Multiplication and division | **Multiply and divide numbers mentally**<br>For every group of 10, there are 2 groups of five.<br>If I double one factor, I must halve the other factor for the product to stay the same.<br>If I multiply one factor by two, I must halve the other factor for the product to stay the same.<br>If I multiply the dividend by __, I must multiply the divisor by __ for the quotient to stay the same.<br>If I divide the dividend by 2, I must divide the divisor by 2 for the quotient to stay the same.<br>When a number is divided by 10, the digits move one place to the right.<br>When a number is multiplied by 10, the digits move one place to the left.<br>**Count forwards, backwards in steps of powers of 10**<br>When counting in ____ the ____ digit won't change.<br>**Recognise and use square and cube numbers**<br>A square means to multiply by its self.<br>A cube number has been multiplied by its self twice.<br>**Identify factors and multiples, know and use prime numbers**<br>1 is a factor of all positive integers.<br>Every positive integer is a factor of itself.<br>The smallest factor of a positive number is always 1.<br>The largest factor of a positive integer is always itself.<br>Numbers that have more than two factors are composite numbers.<br>If you change the order of factors, the product always remains the same.<br>A prime number has only two factors, 1 and its self.<br>**Multiply and divide whole numbers and decimals by 10, 100, 1000**<br>When we divide by 10, the digits move one place to the right.<br>When we divide by 100, the digits move two places to the right.<br>When we divide by 1000, the digits move two places to the right.<br>When we multiply by 10, the digits move one place to the left.<br>When we multiply by 100, the digits move two places to the left.<br>When we multiply by 1000, the digits move two places to the left.<br>**Formal division up to 4d /1d.**<br>How many ___ go into ___.<br>Divide means to share. The answer will be smaller. |
| Fractions A | **Recognise and show equivalent families of fractions**<br>Equivalent means equal or the same.<br>_____ is equivalent to____.<br>A fraction is an equal part of a whole.<br>**Add and subtract fractions with same denominator**<br>When adding fractions, add the parts and keep the denominator the same.<br>Add the wholes then add the parts.<br>A fraction is an equal part of a whole.<br>**Solve problems involving fractions to calculate quantities, including non-unit fractions**<br>As the denominator increases, the parts become smaller.<br>**Mixed number and improper fractions**<br>A fraction is an equal part of a whole. |

| | |
|---|---|
| | An improper fraction has a larger numerator than denominator .<br>A mixed number is larger than a whole.<br>A mixed number has a whole and a part.<br>**Compare and order fractions with multiple denominators**<br>When comparing fractions with the same denominators, the greater the numerator, the greater the fraction.<br>If numerators are the same, the greater the denominator, the smaller the fraction.<br>**Identify and name equivalent fractions**<br>To find an equivalent fraction, you must multiply/divide both the numerator and denominator in the same way.<br>What ever you do to the top, we must do to the bottom.<br>**Count in hundredths**<br>The hundredth column is to the right of the tenths.<br>**Recognise and use thousandths**<br>I know that $/_{1000}$ is the same as ÷1000.'<br>1 whole is a thousand, thousandths. |
| Decimals and Percentages | **Understand per cent and % sign**<br>Percentage is out of 100.<br>**Write percentages as fractions over 100**<br>Percentage is out of 100.<br>Percentages like a fraction with a denominator of 100<br>**Solve problems involving equivalence of simple FDP.**<br>25%, 25/100 and 0.25 are all equivalent.<br>50%, ½ and 0.5 are all equivalent.<br>75% ¾ and 0.75 are all equivalent. |
| Measurement-Perimeter and Area | **Perimeter of rectilinear shapes**<br>Perimeter is the distance around the outside of a 2D shape.<br>To calculate the perimeter we add all the side lengths together.<br>**Area of rectangles**<br>Area is the amount of space a shape covers and is measured in squared units.<br>To calculate the area of a rectangle we do '*l X w'.* |
| Statistics | **Line graphs – comparison, sum and difference problems**<br>What does the x axis represent? The x axis represent____.<br>What does the y axis represent? The y axis represents ____.<br>**Complete, read and interpret tables**<br>The total of ____ is ___. |
| Geometry-Shape | **Estimate and compare acute, obtuse and reflex angles**<br>A right angle is 90°.<br>An acute angle is less than 90°.<br>An obtuse angle is more than 90° but less than 180°.<br>A reflex angle is greater than 180°.<br>**Use properties of rectangles to find missing lengths and angles**<br>A rectangle is a 4 sided shape with 2 pairs of parallel sides.<br>**Identify regular polygons**<br>A triangle is a 3 sided 2D shape.<br>_____ is a _____ because it has _____.<br>A quadrilateral is a 2D 4 sided shape.<br>A regular shape has equal sides and equal angles.<br>**Identify 3D shapes from 2D representations**<br>_____ is a _____ because it has _____. |
| Geometry-Position and Direction | **Describe position of shape following reflection or translation**<br>When we read coordinates, we read x then y.<br>Translation moves a shape by sliding it.<br>Reflection is a mirror image. |
| Decimals | **Recognise and write decimal equivalents of any number of tenths or hundredth**<br>A decimal is part of a whole.<br>1 whole is ten tenths or a hundred hundredths.<br>The decimal equivalent of _____ is ____. |

| | |
|---|---|
| | The 10ths column is to the right of the decimal point.<br>The 100th column is to the right of the 10ths.<br>**Recognise and write decimal equivalents to ___.**<br>____ is equivalent to _____<br>**Order and compare decimals to 2d**<br>____ has a higher value because of the ___ column.<br>**Round decimals to the nearest integer**<br>When rounding to the nearest whole, if the tenths digit is less than 4, round down. If the tenths digit is 5 or above, round up.<br>**Divide a (1 or 2d) number by 10 and 100**<br>When we divide by 10, the digits move one place to the right.<br>When we divide by 100, the digits move two places to the right. |
| Negative Numbers | **Read, write and interpret negative numbers.**<br>A negative number is a number less than zero.<br>When we cross 0, the digit gets larger but the value gets smaller. |
| Measurement- Converting Units | **Solve problems involving four operations and measures**<br>**Convert between metric units**<br>To convert km / kg / l to m /g / ml multiply by 1000.'<br>To convert m/ g / ml to km / kg / l divide by 1000.'<br>To convert cm to m divide by 100.'<br>To convert m to cm multiply by 100.'<br>Capacity is the amount a container or object can hold.'<br>**Understand approximate metric-imperial conversions**<br>1 inch is approximately 2.5cm.'<br>1kg is approximately 2 pounds.'<br>1 pint is approximately ½ a litre.'<br>**Solve problems converting between units of time**<br>There are 60 seconds in 1 minute.<br>There are 60 minutes in 1 hour.<br>There are 24 hours in a day.<br>A leap year occurs every 4 years and has 366 days.<br>Add 12 hours to a 12-hour clock p.m. time to get the equivalent 24-hour clock time. |
| Measurement- Volume | **Estimate volume**<br>Volume is the amount of solid space occupied by an object.<br>To calculate volume we do the length times width times height $l$ X $w$ X $h$ |

## Year 6

| | |
|---|---|
| Place Value | **Recognise place value**<br>There are ten millions in ten million.<br>There are ten one hundred thousands in a million.<br>23, 456, 132 is 23, 456, 132 ones. 23, 456, 132 is 23 millions and 456, 132 ones (etc)<br>One million is one thousand thousands.<br>The ___ represents ____.<br>The value of the ____ is ____.<br>**Compare and order numbers up to 10 000 000 and to 3 decimal places**<br>_____ has a higher value than ____.<br>A decimal is part of a whole represented by digits.<br>Ten tenths make one 100th.<br>Ten 100ths make one 1000th.<br>**Negative numbers**<br>A negative number is a number less than zero.<br>When we cross 0, the digit gets larger but the value gets smaller.<br>**Rounding**<br>1, 2, 3, 4, round it down to the floor. 5, 6, 7, 8, 9, round it up to the number line.<br>___ is between _____ and _____.<br>When rounding to the nearest___, if the _____digit is 4 or less, round down. If the ____ digit is 5 or more than round up.' |

| | |
|---|---|
| Addition, Subtraction, Multiplication and Division | **Generate and describe linear sequences**<br>The ___ digit doesn't change.<br>Each time we are adding/subtracting ____.<br>**Identify common factors**<br>A *factor* is a number that divides into another number exactly and without leaving a remainder.<br>**Identify common multiples**<br>A multiple is a number that is in a times table.<br>**Identify common prime numbers**<br>A prime number is a whole number that only has two factors, itself and one.<br>**Mental calculations**<br>If one factor is made ten times the size, the product will be ten times the size. (multiplying by 10, 100 and 1000.)<br>Remove the zeros, find the product of the single digit and replace the zeros.<br>I know that 3 times 7 is 21 so 0.3 times by 7 must be 2.1.<br>I know that 389 is close to 400 so in 389 + 25, I can do 400 + 25, then subtract 11.'<br>**Formal multiplication up to 4dx2d**<br>To multiply means to repeatedly add.<br>___ multiplied by ___ is ____<br>**Multiply a decimal with up to 2 dp by a single digit**<br>___ multiplied by ___ is ____<br>**Formal division up to 4d / 2d**<br>Divide means to share. The answer will be smaller.<br>How many ___ go into ____.<br>**Divide a decimal by an integer**<br>How many ___ go into ____.<br>I know ÷4 is the same as divide by 4.<br>**Order of operations**<br>BODMAS – Brackets, Orders, Division, Multiplication, Addition, Subtraction |
| Fractions | **Add and subtract fractions with different denominators**<br>To add or subtract denominators must be the same<br>___ is a common denominator.<br>What you do to the bottom, you must do to the top<br>When adding/subtracting fractions, check that the denominators are the same, then add/subtract the parts.'.<br>When adding/subtracting mixed numbers, add/subtract the whole, check the denominators, add/subtract the parts.<br>**Multiply and divide proper fractions**<br>When multiplying fractions by fractions, multiply the numerators and multiply the denominators.<br>**Compare and order fractions**<br>A fraction is an equal part of a whole<br>When comparing fractions with the same denominators, the greater the numerator, the greater the fraction.'<br>If numerators are the same, the greater the denominator, the smaller the fraction.'<br>In unit fractions, the bigger the denominator the smaller the fraction<br>To find an equivalent fraction, whenever you multiply/divide the numerator, you must multiply/divide the denominator.'<br>**Simplify fractions**<br>What you do to the bottom, you must do to the top.<br>___ is the highest common factor. |
| Measurement- Converting Units | **Solve problems involving calculation and conversion of measures and units.**<br>There are 10mm in 1cm.<br>There are 100cm in 1m.<br>There are 1000m in 1km.<br>There are 1000ml in 1L.<br>There are 1000g in 1kg<br>Kilo means 1000.<br>Capacity is the amount a container can hold.<br>Mass is how heavy something is. |

| | |
|---|---|
| | Length is the distance from end to end of an object. |
| Number-<br>Ratio | **Ratio** is a way of comparing quantities<br>The ratio is ___:___<br>The ratio is ___ to ___.<br>For every ____ there are _____.<br>There are ____ parts altogether.<br>_____ squares represents____.<br>Each square represents ____.<br>If ____ cost ____, then ___ costs ____. |
| Number-<br>Algebra | First, I am going to ____, then I am going to_____.<br>____ more than X can be written as _____.<br>If ____ is worth ____ then ___ is worth.<br>The inverse of _____ is _____. |
| Decimals | **Multiply and divide numbers (inc decimals) by powers of 10**<br>Multiplying by ten, moves each digit one place to the left<br>Dividing by ten, moves each digit one place to the right<br>Multiplying by one hundred, moves each digit two places place to the left<br>Dividing by one hundred, moves each digit two places place to the right **(continue but replace power of 10 and amount of movement)**<br>A decimal is part of a whole represented by digits.<br>Ten tenths make one $100^{th}$.<br>Ten 100ths make one $1000^{th.}$ |
| Fractions, Decimals and Percentages | **Solve percentage calculation problems**<br>**FDP equivalence**<br>50% x _____ means 50% of _____.<br>I know percent means out of 100 so 25% is 25/100.<br>To express a fraction as a decimal, divide the numerator by the denominator.<br>Percentage is out of 100.<br>Percentage is out of 100.<br>Percentages like a fraction with a denominator of 100<br>**Solve problems involving equivalence of simple FDP.**<br>25%, 25/100 and 0.25 are all equivalent.<br>50%, ½ and 0.5 are all equivalent.<br>75% ¾ and 0.75 are all equivalent. |
| Measurement-<br>Perimeter, Area and Volume | **Area of parallelograms**<br>Area is the amount of surface a shape covers.<br>To calculate the area of a parallelogram we do' *l X w'.*<br>**Areas of triangles**<br>Area is the amount of surface a shape covers<br>To calculate the area of a triangle we do, length times height and divide by 2. L X H<br>**Volume of cuboids**<br>To calculate volume we do the length times width times height *l* X *w* X *h* |
| Statistics | Add all the values and divide by how many there is.<br>If I know ……..% then I can work out ……..%.<br>The fraction/percentage of ……. is ……<br>The whole pie chart represents 100% |
| Geometry-<br>Shape | **Name parts of circles**<br>The radius is half the diameter<br>The circumference is the outside edge**.**<br>**Angles at a point**<br>Angles at a point total 360 degrees<br>**Angles on a straight line**<br>Angles on a straight line total 180 degrees<br>**Vertically opposite angles** |

| | |
|---|---|
| | Vertically opposite angles are equal<br>**Compare and classify geometric shapes** |
| Geometry- Position and Direction | **Coordinates – 4 quadrants**<br>Along the X axis and up/ down the Y<br>Along the corridor and up/down the stairs.<br>**Translations**<br>Translation moves a shape by sliding it. |

# Assessment

Summative assessments are completed termly starting in Year 1 Autumn term. We use the end of unit Whiterose assessment for that term which is based on the taught curriculum. Scores are used alongside teacher assessment to determine where children are working, against the expected standard. Where specific gaps are identified for a single child, whole group or class, staff will adapt their curriculum accordingly. Where children are working towards the expected standard, they will be targeted through quality first teaching or more specific interventions, depending on their need. Formative assessment take place daily in maths lessons using the key strategies stated above.