# Stamford Green Primary School \& Nursery 



Mathematics Compendium

# "The enchanting charms of this sublime science, mathematics, reveal only to those who have the courage to go deeply into it." 

Carl Frederick Gauss

## What is the vision for mathematics at Stamford Green?

- Children see themselves as mathematicians, enjoying the challenges of a rich subject, wanting to know more and understand more.
- Children develop a deep understanding of skills and concepts and use these accurately.
- Children are fluent and agile in accurately applying their skills to solve mathematical problems.
- Children relish investigations. They apply concepts they know, seek out patterns, think abstractly, work systematically, are flexible and creative in their strategies, and are persistent in solving challenging problems.
- Children are well-prepared for their future learning through strong foundations and deep mathematical understanding. In addition, they are well-equipped with life skills such as analysis, problem-solving and reasoning.


## Our mathematics curriculum is brought to life by our seven commitments:


#### Abstract

HAPPINESS Our rich and exciting curriculum allows the children to have the confidence to enjoy maths. During lessons, all children are expected and encouraged to get involved and approach their maths learning with a can-do attitude. They get this by adopting a growth mindset from an early age. Understanding that mistakes are part of the learning journey and that making mistakes and learning from these makes us better learners; better mathematicians. As such, the children feel positive about maths as the learning environment and everybody in it has a positive growth mindset.

\section*{I N S P I R IN G}

Through our engaging curriculum, we aim to inspire our children to see the beauty of maths. The way that maths is interconnected through all areas of everyday life, enriching the conversations that all adults should be having with children to make relevant how mathematicians have made and still do make a difference in the world. Through allowing the children to experience a range of different mathematical problems, they will have the confidence to tackle these whilst developing their ability to choose and apply specific strategies in order to approach and solve problems.


## LEARNING

Our curriculum has been designed to progressive so that it builds upon and develops children's skills and knowledge so that it can be applied in a variety of different situations. This will be accessed through the use of the maths mastery approach which seeks to develop a deep understanding of maths where a child can use their knowledge of a concept to solve unfamiliar word problems and undertake complex reasoning, using precise mathematical vocabulary. Our maths offer consists of discrete arithmetic teaching sessions as well as arithmetic practise sessions, alongside daily maths lessons that take the whole group of children on a particular learning journey together. Once per week, there will be dedicated problem-solving session with a whole school focus on a particular problem-solving strategy. Before school each day, every child has the opportunity to be immersed in maths by taking part in our 'Early Bird' maths sessions, where children practise retrieval of key concepts and knowledge from learning that has taken place previously. Daily maths lessons will introduce children to new concepts using small steps which build upon one another, making links and 'sniffing out patterns' along the way. Teachers will use 'Fathoms' as a vehicle for deepening the children's knowledge and understanding. These Fathoms should allow for both practise and problem solving at every stage, built in to the structure of the maths lesson so everyone gets to access everything they need. Teachers use Times Tables Rock Stars and My Maths as tools to support the learning at school through home learning. They aim to broadly match home learning tasks to content being taught in maths lessons and, in the case of TTRS, are targeted according to the needs of the children.

## TOGETHERNESS

The maths mastery approach enables all pupils to go on the journey of maths mastery together. Using an 'I do, we do, you do' teaching strategy enables children to use teacher modelling in order to practise maths concepts with the support of their classmates. The children value each other's contributions because they are all working on the same thing at the same time. Nobody is left behind because the children understand that everyone sees concepts in different ways and this helps each and every child to further develop their understanding.

## V A L U ES

Our school's 22 values all play an important role in maths learning. Part of being a mathematician requires all learners to foster the values of resilience, effort, self-belief and patience. Having a growth mindset equips the children to continue working on a problem by approaching it in a different way, when another doesn't work. In this way, children will demonstrate independence when working in maths.

## A M B ITION

Adopting a growth mindset approach to maths mastery allows the children to see themselves as mathematicians. We want the children to strive to be successful and as a result, lessons are planned in a way that gives the children confidence. Where gaps in a child's learning arise, timely interventions allow children to keep up, not catch up. As a school, we are ambitious for our teachers and teaching assessments by investing in their Continuing Professional Development. Providing effective, regular CPD for our staff will ensure that there is a consistent approach to teaching and supporting our children with their maths learning.

## ACHIEVEMENT

In order to be successful in all maths lessons, the children will receive immediate feedback through live marking. This means that all learners get what they need to make progress. We have high expectations of the children's achievements and as such strive for the number of our children to achieve the expected standard to be above Surrey and National data at the end of Key Stage 1 and 2. This will also be in line with the same data for Reading and Writing. It is the expectation that all children are fluent with their times tables facts by the end of Year 4, so that they are well-prepared for their Multiplication Tables Check in the summer term.

## What are the aims of the national curriculum for mathematics?

The national curriculum for mathematics aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

## By the end of Year 6 at Stamford Green, our children will...

Behaviours

## Attitudes

Skills

Knowledge

Experiences

Our children will demonstrate positive behaviours during maths lessons. They will feel confident to support or challenge each other when discussing or using mathematical concepts as well as be able to choose from a range of strategies to help them approach a maths problem.
Through our progressive curriculum which promotes a growth mindset approach to learning, children will show a positive attitude towards their maths learning. They will develop their values of resilience and self-belief when understanding that making mistakes is part of the learning process. Children will support the thinking that maths isn't always about finding 'the correct answer', but about how they arrived at that answer and understanding why it is correct.
Our detailed curriculum, with learning broken down into small steps, will allow children to add, subtract, multiply and divide. They will be confident and fluent in their recall of number facts including times tables. Through effective modelling of precise mathematical vocabulary by the teacher, children will be able to articulate succinct reasoning as well as demonstrate effective recording methods which show working out. Discretely taught problem-solving lessons will directly teach specific problem-solving strategies which will equip our children to choose the most efficient method in their learning beyond Key Stage 2.
Our carefully considered sequence of learning will make explicit links to previous learning, allowing for retrieval practise as well as the opportunity to notice how concepts build on those they have learned before. The children will use the correct mathematical vocabulary when explaining their reasoning, as modelled by the teacher. Children will be expected to 'say it again better' or use sentence stems to frame their reasoning, incorporating this precise mathematical language used correctly.
We aim to give the children a wide range of experiences which allow them to explore and investigate mathematics. They will use specifically chosen manipulatives and visual representations in order to scaffold the rich discussion

| Technology | around the mathematical concepts they are modelling. The children will be able <br> to experience the awe and wonder maths can provide through open-ended <br> problems to solve. Events planned to promote the learning and fluency of times <br> tables facts will raise the profile of maths and motivate the children to develop <br> automaticity in this skill. |
| :--- | :--- |
| We use technology as a tool to provide instant feedback about the children's <br> learning. At home, online tasks are set by the class teachers in order to practise the <br> learning that is happening in school. We prepare our Year 4 children for the <br> Multiplication Tables Check by providing regular practice using simulation software <br> so the children are familiar with the style and layout of the test before they <br> complete the actual check in June. We use a wide range of manipulatives to <br> support the children's mathematical learning, including digital manipulatives <br> where appropriate. |  |
| Sustained | It is our aim that the children leave Stamford Green with a sustained interest in <br> mathematics, having embedded basic mathematical concepts during their time <br> with us. We want the children to transfer to secondary school with the same positive <br> attitude fostered throughout theirtime at Stamford Green because we feel it's vital <br> that they continue to see themselves as mathematicians. With all of this in place, <br> we believe the children will be equipped with the best possible foundations in <br> mathematics which will help them in their future life choices and careers. |

## British Values and Spiritual, Moral, Social and Cultural Learning in Maths

British Values: Within maths, children are encouraged to consider the views of others, particularly when problem solving. Children work within boundaries to make safe choices during practical activities and behave appropriately, allowing all children the opportunity to work effectively. In maths, children are taught to take turns, share equipment and reviews each other's ideas respectfully. Maths involves working collaboratively to solve problems, offer solutions and help others.

Spiritual: Each maths lesson ensures that the children develop the knowledge, skills, understanding, qualities and attitudes they need to foster their own understanding of the subject. Maths supports spiritual development by engaging children with depth of thinking and problem solving.

Moral: Practical work in maths requires children to co-operate with others and help others where necessary to achieve as a group of pair. These opportunities require children to be selfless and explain mathematical concepts in detail to others. Maths supports moral development by encouraging children to look, discuss and evaluate a range of social and moral issues found in the world.

Social: Social development in enhances in maths lessons are children are provided with opportunities to work individually, with a partner or in a larger group. Maths supports social development by requiring verbal reasoning. Children have opportunities to discuss their learning with their peers and staff.

Cultural: Children acquire a respect for their own culture and that other others, an interest in others' ways of doing things and curiosity about differences. During maths, children are able to share how they carry out calculations and listen to the opinions of others. Maths supports the cultural development of a child by exposing them to a range of different approaches to solving problems and reasoning skills.

The maths curriculum map

|  | Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \bar{E} \\ & \frac{D}{5} \\ & \frac{5}{4} \end{aligned}$ | Counting and Comparing Use the counting sequence as part of songs and games. (Numbers 0-5) | Number Investigating. recognising and using numbers 0-5 | Number <br> Place value (within 10) | Number Place value | Number Place value | Number Place value | Number Place value | Number Place value |
|  |  |  |  |  | Number <br> Addition and <br> subtraction |  | Number Addition and subtraction | Number Addition, subtraction. multiplication and division |
|  |  |  | Number Addition and subtraction (within 10) | Number Addition and subtraction |  | Number Addition and subtraction | Number Multiplication and division A |  |
| $\begin{aligned} & \text { N } \\ & \frac{c}{E} \\ & \frac{5}{5} \\ & 4 \end{aligned}$ | Counting and Comparing Develop fast recognition of objects without having to count (subitising) and react to changes in the amount of objects in a group of the same amount (numbers 0 to 3 ) | Number Investigating. recognising and using numbers 0 $-10$ |  |  |  |  |  |  |
|  |  |  |  |  |  | Measurement Area |  | Number Fractions A |
|  |  |  |  |  | Number Multiplication and division A | Number Multiplication and division A | Number Fractions A |  |
|  |  |  | Geometry Shape | Geometry Shape |  |  |  | Number Fractions B |
|  |  |  | Consolidation |  |  | Consolidation |  | Measurement Converting units |
|  | Exploring <br> Number and <br> Pattern <br> Knowing <br> cardinal <br> principle (last <br> number <br> reached tells <br> you the total) | Number 'more than' and 'less than' | Number Place value (within 20) | Measurement Money | $\begin{aligned} & \text { Number } \\ & \text { Multiplication } \\ & \text { and division B } \end{aligned}$ | Number Multiplication and division B | NumberMultiplicationand division B | Number Ratio |
|  |  |  |  |  |  |  |  | Number Algebra |
|  |  | Number <br> Parts and wholes - addition and subtraction |  | Number Multiplication and division | $\begin{aligned} & \text { Measurement } \\ & \text { Length and } \\ & \text { perimeter } \end{aligned}$ | Measurement Length and perimeter | Number Fractions B |  |
|  |  |  | Number <br> Addition and |  |  |  |  | Number Decimals |
|  |  |  | subtraction (within 20) |  |  | Number Fractions | Number Decimals and percentages |  |
| N을등 | Exploring <br> Number and <br> Paftern <br> Linking numerals <br> to amounts, <br> children <br> represent <br> numbers in different ways. | Number Representations including 10 frames | Number Place value (within 50) |  | Number <br> Fractions A |  |  | Number <br> Fractions, decimals and percentages |
|  |  | Number <br> Parts and wholes - addition and subtraction to 8 including doubles. | Measurement Length and height | Measurement Length and height |  |  | Measurement Perimeter and area | Measurement Area perimeter and volume |
|  |  |  | Measurement Mass and volume | Measurement Mass, capacity and temperature | Measurement Mass and capacity | Number Decimals A | Statistics | Statistics |
| $\begin{aligned} & - \\ & \stackrel{\rightharpoonup}{\Phi} \\ & E \\ & E \\ & 5 \end{aligned}$ | Problem Solving Solving realworld problems with numbers up to 5 using a range of resources. | Number 'one more' and 'one less' | Number Multiplication and division | Number Fractions | Number Fractions B | Number Decimals B | Geometry Shape | Geometry Shape |
|  |  | Number Investigating. recognising and using teen numbers. <br> Money |  |  | Measurement Money | Measurement Money |  |  |
|  |  |  | Number Fractions | Measurement Time |  |  | Geometry Position and airection | Geometry Position and direction |
|  |  |  | Geometry Position and direction |  | Measurement Time | Measurement Time |  | Consolidation and themed projects. <br> Preparation and transition to Key Stage 3 |
| $\begin{aligned} & \text { N } \\ & \stackrel{y}{\Phi} \\ & \frac{E}{E} \\ & \vdots \end{aligned}$ | Problem Solving Recording numbers to 5 , children can find the odd one out and give a reason. | Number Number order Clocks | Number Place value (within 100) | Statistics |  | Consolidation | Number <br> Decimals |  |
|  |  |  |  |  | Geomelry Shape | Geometry Shape |  |  |
|  |  | Number Sharing | Measurement Money | Number Position and direction |  |  | Number Negative numbers |  |
|  |  |  | Measurement Time |  | Statistics | Statistics | Measurement Converting units |  |
|  |  | Number <br> Thinking about tens and ones | Consolidation | Consolidation | Consolidation | Geometry Position and direction | Measurement Volume |  |

## Long Term Plan: Early Years Foundation Stage

## Milestones - By the end of the EYFS, children at the expected level of development will...

## ELG Number

- Have a deep understanding of number to 10 , including the composition of each number;
- Subitise (recognise quantities without counting) up to 5 ;
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10 , including double facts


## ELG: Numerical patterns

- Have a deep understanding of number to 10 , including the composition of each number;
- Subitise (recognise quantities without counting) up to 5 ;
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts


## According to the Early Years Statutory Framework, children in Nursery and Reception should be taught:

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically.

Children should be able to count confidently, develop a deep understanding of the numbers to 10 , the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built.

In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes

The new vocabulary the Reception children will use will include:

|  | Tier 1 | Tier 2 | Tier 3 |
| :---: | :---: | :---: | :---: |
| Place Value | same, more/less, lots | count on/back, number, subitise, order, forwards, backwards, numerals, one more/less, equal to, more/less than, represent, value, digit | partition sort |
| Addition and subtraction |  | number bonds, part, whole | number sentence equals |
| Multiplication and division |  | double, equal/lly, odd/even | twice as many |
| Measurement | little, tall, bigger/smaller | longest/tallest days of the week money | calendar months of the year measure |
| Geometry | high/low | sides, corners, above/below/behind, top/middle/bottom, over/under, curved, flat, on, into, next to, repeat, pattern | faces, pyramids, between, around, through, beneath |

In Nursery, the 2-3 year-old children will be faught: Counting and Comparing

| Learning Focus | Key skills |
| :--- | :--- |
| Showing enjoyment <br> when number <br> rhymes are sung to <br> them. | Recognise and join in with counting songs and games using <br> actions and voice |
| Using actions <br> showing <br> recognition of the <br> rhythm of counting. | • Moves in time to counting |

Exploring Number and Pattern

| Learning Focus | Key skills |
| :--- | :--- |
| Building a tower or <br> creating lines with <br> objects. | $\bullet$ Show finger numbers up to 3 |
| Matching one <br> object with another <br> during play. | $\bullet$ Complete an inset puzzle |

Problem Solving

| Learning Focus | Key skills |
| :--- | :--- |
| Organises sets of <br> natural or everyday <br> objects in a group. | $\bullet$ Recognises difference and changes in amounts |
| Uses number names <br> in play. | $\bullet$ Begin to subitise to 5 in familiar scenarios (dice, numicon etc) |

In Nursery, the 3-4 year-old children will be taught:

## Counting and Comparing

| Learning Focus | Key skills |
| :--- | :--- |
| Using the counting <br> sequence in playful <br> contexts. | • Verbally count forwards and backwards up to 5 <br> • Use the language more /less /the same/lots |
| Developing fast <br> recognition of up to <br> 3 objects without <br> having to count <br> (subitising) | • React to changes of amount in a group up to 3. |


| Exploring numbers and patterns |  |
| :---: | :---: |
| Learning Focus | Key skills |
| Knowing cardinal principle (last number reached tells you the total) | - Show finger numbers up to 5 <br> - Find the 'odd one out' in a range of contexts. |
| Linking numerals to amounts and representing numbers in different ways. | - Complete a jigsaw puzzle <br> - Read the labels to match the amount when tidying up. <br> - Subitise for up to 3 objects |
| Problem Solving |  |
| Learning Focus | Key skills |
| Solving real-world problems with numbers up to 5 . | - Find 1 more/l less <br> - Building with a range of resources |
| Recording numbers | - Begin to subitise to 5 in familiar scenarios (dice, numicon etc) <br> - Find the odd one out and give a reason <br> - Recognise and write numerals 0-5 |

In Reception the children will be faught:

## Becoming friends with numbers

| Learning Focus | Key skills |
| :---: | :---: |
| Investigating, recognising, playing with and using numbers 1-5 | - Count and represent amounts to 5 using concrete resources and pictures <br> - Recognise and write numerals to 5 <br> - Begin to subitise to 5 in familiar scenarios (dice, numicon etc) <br> - Verbally count to 10 forwards and backwards |
| Investigating, recognising, playing with and using numbers 0-10 | - Count and represent amounts $0-10$ using concrete resources and pictures <br> - Recognise and write numerals 0-10 <br> - Subitise confidently to 5 in a range of contexts <br> - Verbally count to 20 forwards and backwards |

## Parts and wholes

| Learning Focus | Key skills |
| :---: | :---: |
| Understanding 'More than' and 'Less than' | - Compare quantities up to 10 in different contexts |
| Thinking about Addition and Subtraction concepts. | - Recognise parts and whole for numbers to 5. <br> - Begin to use the symbols + , - and $=$ to represent calculations <br> - Begin to recognise that there are number facts that never change <br> - Verbally count to 30 forwards and backwards <br> - Count forwards and backwards from any number to 10 |
| Exploring different representations | - Represent the parts and whole for addition and subtraction using a range of concrete resources and drawings |
| Knowing about Addition and Subtraction to 8, including doubles. | - Automatically recall number bonds to 5 (addition and subtraction facts) <br> - Subitise up to 10 using a ten frame to support thinking <br> - Verbally count to 30 forwards and backwards starting from any number |
|  | Exploring numbers and patterns |
| Learning Focus | Key skills |
| 'One More' and 'One Less' | - Count and represent amounts $10-20$ using concrete resources and pictures |
| Investigating, recognising and playing with teen numbers. | - Recognise and write the numerals 0-20 |
| Number patterns and number order. | - Explore numerical patterns in the number system including odds and evens and doubles <br> - Automatically recall some number bonds to 10 including doubles facts |
| Sharing | - Investigate the ways in which quantities can be distributed equally |
| Understanding Place value - tens and ones | - Verbally count forwards and backwards to 50 <br> - Begin to recognise the value of the digits in 2-digit numbers <br> - Count in 10 s to 100 |

## Long Term Plan: Year 1

## Milestones - By the end of Year 1, children will demonstrate...

- Count to and across 100, forwards and backwards, beginning with 0 or 1 , or from any given number
- Count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens
- Identify one more and one less
- Identify and represent numbers using objects and pictorial representations, including the number line
- Use the language of: equal to, more than, less than (fewer), most, least
- Read and write numbers from 1 to 20 in numerals and words.
- Work with numbers up to 20 using addition and subtraction
- Children should begin to solve simple word problems
- Identify halves and quarters
- They need to use a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money
- Begin to tell the time - o'clock and half past
- Children should develop their ability to recognise, describe, draw, compare and sort different shapes (2D and 3D) and use the related vocabulary
- Know the days of the week and months of the year


## According to the National Curriculum, children in Year 1 and Year 2 should be faught:

The principal focus of mathematics teaching in Key Stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources [for example, concrete objects and measuring tools].

At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

By the end of Year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.

Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

The new vocabulary the Year 1 children will use will include:

|  | Tier 1 | Tier 2 | Tier 3 |
| :---: | :---: | :---: | :---: |
| Place Value | same, more/less, lots count on/back, number, subitise, order, forwards/backwards, numerals, one more/less than, equal to, more/greater than, represent, value, digit | sort, partition, ones, tens, most/least, symbols, exchange, multiples, fewer | count in steps, compare, representation |
| Addition and subtraction | number bonds, part, whole | number sentence, add/addition/+, subtraction/subtract/ difference between, equals, fact family, problems, 2-digit number | sum, problem |
| Multiplication and division | double, equal/lly, odd/even, | multiplication, division, arrays, twice as many, column, row, multiples, repeated addition, sharing, grouping | multiplication tables |
| Fractions |  | half, quarter, whole, equal parts | three quarters, third, equivalent fractions |
| Measurement | little tall bigger smaller | shorter/longer, biggest/smallest, weight/mass, heavy(er)/light(er), wid(er)/narrow(er), balanced, length, height, centimetre (cm), non-standard units, <br> longest/tallest/shortestr uler, volume, capacity, volume, month, year, time, analogue, o'clock, half past, second/hour/minutes, before/after, first/next, then/now, today/yesterday/ tomorrow, <br> morning/afternoon, evening/night, chronological order, days of the week, calendar, months of the year, money, coins, notes, | standard units, kilogram <br> (kg), <br> gram (g), litres (I), millilitres (ml), change |


|  |  | pounds (£), pence (p), <br> half/half full, empty, <br> measure |  |
| :---: | :---: | :---: | :---: |
| Geometry | high/low, sides, <br> corners, <br> above/below/behin <br> d, <br> top/middle/bottom, <br> over/under, curved, <br> flat, on, into, next to, <br> repeat, pattern | 2d shapes, rectangle, <br> square, circle, triangle, <br> pentagon, properties, <br> sorting diagram, 3d <br> shapes, cuboids, <br> cubes, cone, spheres, <br> pyramids, cylinders, <br> faces, position, in front <br> of, beside, | pentagon, hexagon, <br> line of symmetry, <br> polygon, prism, <br> clockwise, ordinal |

In Year 1, the children will be taught:

| Number and Place Value |  |
| :---: | :---: |
| Focus | Progression of skills |
| Count | to and across 100, forwards and backwards, starting at 0,1 or any given number. |
|  | in multiples of 2,5 and 10 |
| read \& write numerals | 0-100 |
| read and write words | 0-20 |
| identify | one more or one less than a given number |
|  | numbers using objects and pictorial representations including on number lines |
| represent | numbers in different ways - including using objects and pictorial representations and number lines |
| use the language | equal to, more than, less than, fewer, most, least |
| Number - addition and subtraction |  |
| Focus | Progression of skills |
| Read, write and interpret | statements using the signs + (addition) - (subtraction) = (equals) |
| Represent \& use number facts | number bonds and related subtraction facts within 20 |
| Add and subtract | 1-digit and 2-digit numbers to 20, including zero. |
| Solve problems | one-step problems with addition and subtraction using concrete objects and pictorial representation |
|  | missing number problems |

## Skill: Add 1-digit numbers within 10

$l$ | When adding numbers |
| :--- |
| to 10, children can |
| explore both |

Skill: Add 1 and 2-digit numbers to 20

|  | When adding 1-digit numbers that cross 10 , it is important to highlight the importance of ten ones equalling one ten. <br> In Year 1, this is only done just by counting on. <br> From Year 2, use different manipulatives can be used to represent this exchange alongside number lines to support children in understanding how to partition their jumps. |
| :---: | :---: |
| Skill: Subtract 1-digit numbers within 10 |  |
| $7-3=4$ <br> $-900-000-$ | Part-whole models, bar models, ten frames and number shapes support partitioning. <br> Ten frames, number tracks, single bar models and bead strings support reduction. <br> Cubes and bar models with two bars can support finding the difference. |



In Year 1, subtracting one-digit numbers that cross 10 , is done by counting back, using objects, number tracks and number lines.

From Year 2, children should be encouraged to find the number bond to 10 when partitioning the subtracted number.

Ten frames, number shapes and number lines are particularly useful for this.

Number - multiplication and division

| Focus | Progression of skills |  |
| :---: | :---: | :---: |
| solve | one-step multiplication and division problems with teacher support |  |
| use | concrete objects |  |
|  | pictorial representations |  |
|  | arrays |  |
| Skill: Solve 1-step problems involving multiplication |  |  |
|  |  | Children represent multiplication as repeated addition in many different ways. In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record multiplication formally. <br> In Year 2, children are introduced to the multiplication symbol. |

Skill: Solve 1-step problems involving division (sharing)


Children solve problems by sharing amounts into equal groups. In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record division formally.

In Year 2, children are introduced to the division symbol.

## Skill: Solve 1-step problems involving division (grouping)



Children solve problems by grouping and counting the number of groups. Grouping encourages children to count in multiples and links to repeated subtraction on a number line.

They can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division.

| Number - fractions |  |
| ---: | :--- |
| Focus | Progression of skills |
| Recognise, find and | half as one of two equal parts of an object, shape or quantity |
| name | quarter as one of four equal parts of an object, shape or quantity. |


| Focus | Progression of skills |
| :---: | :---: |
| Compare, describe and solve practical problems for | lengths and heights |
|  | mass/weight |
|  | capacity and volume |
|  | time |
| Measure and begin to record | Lengths, heights, mass/weight, capacity, volume, time (hours, minutes seconds) |
| Recognise and know values | All denominations of British coins and notes |
| Chronologically sequence events | For example by using: <br> - before, after, next, first <br> - today, yesterday, tomorrow <br> - morning, afternoon, evening, night |
| Recognise and use | language related to dates |
| Tell the time | - to the hour and half hour |
|  | - draw hands on an analogue clock to show the hour and half hour |
| Geometry |  |
| Focus | Progression of skills |
| recognise and | common 2-D shapes |
| name | common 3-D shapes |
| describe | position |
|  | direction |
|  | movement |



## Long Term Plan: Year 2

## Milestones - By the end of Year 2, children will demonstrate...

- Count in steps of 2,3,5 from 0, in tens from any number forwards and backwards, in halves and quarters up to 10 as well as in multiples of twos, fives and tens
- Read and write numbers to 100 in numerals and compare these using <, > and =.
- Identify and represent numbers using objects and pictorial representations, including the number line
- Work with numbers up to 100 using addition and subtraction
- Children should develop the ability to solve simple word problems using knowledge of place value and number facts as well as 1 -step problems involving multiplication and division (by sharing and grouping)
- Recall and use multiplication and corresponding division facts for the 2,5 and 10 times tables.
- Multiply and divide using a range of representations including arrays and repeated addition/subtraction.
- Recognise, find, name and write the following fractions ( $1 / 3,1 / 4,2 / 4,3 / 4$ ) of a length, shape, set of objects or quantity.
- They need to use a range of measures to describe and compare different quantities such as length, mass, capacity/volume, temperature, time and money
- Continue to learn to tell the time to 5-minute intervals.
- Children should develop their ability to recognise, describe, draw, compare and sort different shapes (2D and 3D) and use the related vocabulary including, number of sides, vertices, faces, edges and lines of symmetry.
- Know the number of minutes in an hour and hours in a day.


## According to the National Curriculum, children in Year 1 and Year 2 should be faught:

The principal focus of mathematics teaching in Key Stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources [for example, concrete objects and measuring tools].

At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

By the end of Year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.

Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

The new vocabulary the Year 2 children will use will include:

| Place Value | Tier 1 <br> same, more/less, lots, <br> count on/back, <br> number, subitise, <br> order, | Tier 2 <br> count in steps, count in <br> multiples, place value, <br> estimate, compare (<, <br> $>,=$, placeholder, <br> hundreds, | ascending, <br> forwards/backwards, <br> numerals, one <br> more/less than, equal <br> representation <br> than, represent, |
| :---: | :---: | :---: | :---: |


|  | shortest, ruler, volume, capacity, volume, month, year, time, analogue, o'clock, half past, second/hour/minute s, before/after, first/next, then/now, today/yesterday/to morrow, morning/afternoon, evening/night, chronological order, days of the week, calendar, months of the year, money, coins, notes, pounds (£), pence (p), half/half full, empty, measure | analogue, digital, value, change |  |
| :---: | :---: | :---: | :---: |
| Geometry | 2d shapes, rectangle, square, circle, triangle, pentagon, properties, sorting diagram, 3d shapes, cuboids, cubes, cone, spheres, <br> pyramids, cylinders, faces, position, in front of, beside, inside/outside of, grids, near/far second (2nd), third (3 ${ }^{\text {rd }}$ ) <br> fourth ( $4^{\text {th }}$ ), direction forwards/backwards, whole turn, half turn, quarter turn, threequarter turn, clockwise, movement, up/down, left/right, between, around, through, beneath | pentagon, hexagon, line of symmetry, polygon, quadrilateral, cylinder, edges, vertex/vertices, prism, faces, anti-clockwise, straight line, rotation (turn), arrange, sequences, right angle (turn) | heptagon, octagon, right angle, horizontal, vertical, ordinal |
| Statistics |  | pictograms, tally chart, block diagram, category, sorting, totalling, comparing, tables | bar chart |

In Year 2, the children will be taught:
Number and Place Value

| Focus | Progression of skills |
| :---: | :---: |
| count | in steps of 2,3,5 from 0 forwards and backwards |
|  | in tens from any number forwards and backwards |
|  | in halves and quarters up to 10 |
| recognise place value | of each digit in a 2-digit number (tens and ones) |
| identify and estimate | numbers using different representations including number lines |
| compare and order | numbers up to 100 |
|  | Using the signs < > and = |
| read and write words and numerals | 0-100 |
| solve problems | using place value and number facts |

Number - addifion and subtraction

| Focus | Progression of skills |  |
| :---: | :---: | :---: |
| add and subtract | Using concrete objects, pictorial representations and mentally: <br> - 2-digit numbers +/- ones <br> - 2-digit numbers +/- tens <br> - 2-digit numbers +/- 2-digit numbers <br> - three 1 -digit numbers |  |
| recall \& use number | addition and subtraction facts to 20 fluently |  |
| ct | derive and use related facts up to 100 |  |
| show | addition of numbers can be done in any order (commutative) but that subtraction cannot. |  |
| recognise and use | to check calculations |  |
|  | to solve missing number problems |  |
| solve problems | using concrete objects and pictorial representations, involving numbers, quantities and measures |  |
|  | applying increasing knowledge of mental and written methods |  |
| Skill: Add 1 and 2-digit numbers to 20 |  |  |
|  |  | When adding 1-digit numbers that cross 10 , it is important to highlight the importance of ten ones equalling one ten. <br> In Year 1, this is only done just by counting on. <br> From Year 2, use different manipulatives can be used to represent this exchange alongside number lines to support children in understanding how to partition their jumps. |

Skill: Add three 1-digit numbers


$$
7+6+3=16
$$



When adding three 1digit numbers, children should be encouraged to look for number bonds to 10 or doubles to add the numbers more efficiently.

This supports children in their understanding of commutativity.

Manipulatives that highlight number bonds to 10 are effective when adding three 1 -digit numbers.
Skill: Add 1-digit and 2-digit numbers to 100


When adding single digits to a two-digit number, children should be encouraged to count on from the larger number.

They should also apply their knowledge of number bonds to add more efficiently e.g. $8+5$ $=13$ so $38+5=43$.

Hundred squares and straws can support children to find the number bond to 10 .

Skill: Add two 2-digit numbers to 100


Children can use a blank number line and other representations to count on to find the total.

Encourage them to jump to multiples of 10 to become more efficient.

From Year 3, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters.

As numbers become larger, straws become less efficient.


In Year 1, subtracting


$$
14-6=8
$$

man



Skill: Subtract 1 and 2-digit numbers to 100

$65-28=37$

one-digit numbers that cross 10 , is done by counting back, using objects, number tracks and number lines.

From Year 2, children should be encouraged to find the number bond to 10 when partitioning the subtracted number.

Ten frames, number shapes and number lines are particularly useful for this.

Children can also use a blank number line to count back to find the difference. Encourage them to jump to multiples of 10 to become more efficient.

From Year 3, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.

## Number - multiplication and division



## Skill: 10 times table


$-000000000000000000$


| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | $(10)$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | $(20$ |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 90 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 |

Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the ten times table, using concrete manipulatives to support.

Notice the pattern in the digits - the ones are always 0 , and the tens increase by 1 ten each time.

Skill: Solve 1-step problems involving multiplication


Children represent multiplication as repeated addition in many different ways. In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record multiplication formally.

In Year 2, children are introduced to the multiplication symbol.
Skill: Solve 1-step problems involving division (sharing)


Children solve problems by sharing amounts into equal groups. In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record division formally.

In Year 2, children are introduced to the division symbol.


Children solve problems by grouping and counting the number of groups. Grouping encourages children to count in multiples and links to repeated subtraction on a number line.

They can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division.

| Number - fractions |  |
| :---: | :---: |
| Focus | Progression of skills |
| recognise, find, name and write | 1/3, $1 / 4^{\prime} 2 / 4,3 / 4$ of a length, shape, set of objects or quantity |
| write | simple fractions of number e.g. $1 / 2$ of $6=3$ |
| recognise | equivalence of $2 / 4$ and $1 / 2$ |
| Measurement |  |
| Focus | Progression of skills |
| choose and use | appropriate standard units to estimate and measure to the nearest appropriate unit: <br> - lengths and heights ( $m, \mathrm{~cm}$ with rulers and tape measures) <br> - mass/weight (Kg, g with scales) <br> - capacity and volume (Litres, ml with measuring vessels <br> - Temperature ( ${ }^{\circ} \mathrm{C}$ with thermometers) |
| compare and order | lengths, heights, mass/weight and volume and record using > < and = |
| recognise | symbols for £ and p |
| combine | amounts (coins/notes) to make a particular value |
|  | different combinations of coins that equal the same amount of money |
| solve problems | in a practical context involving addition and subtraction of money of the same unit, including giving change. |
| compare \& sequence | intervals of time |
| tell and write the time | to five minutes (including quarter past/quarter to the hour) |
|  | draw the hands on an analogue clock to show these times |
| know | the number of minutes in an hour |
|  | the number of hours in a day |

## Geometry

| Focus | Progression of skills |
| :---: | :---: |
| Identify and describe the properties of | 2-D shapes <br> - number of sides <br> - line symmetry in a vertical line |
|  | 3-D shapes <br> - number of edges <br> - number of vertices <br> - number of faces |
| identify | 2-D shapes on the surface of 3-D shapes and everyday objects |
| order and arrange | mathematical objects in patterns and sequences |
| Use mathematical vocabulary to describe | position, direction and movement <br> - movement in a straight line <br> - rotation as a turn <br> - rotation in terms of right-angle turns clockwise and anticlockwise |
| Statistics |  |
| Focus | Progression of skills |
| interpret and construct | simple pictograms |
|  | tally charts |
|  | block diagrams |
|  | simple tables |
| ask and answer questions | by counting the number of objects in each category |
|  | by sorting categories by quantity |
|  | about totalling and comparing categorical data |


|  | Year 2 |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Maths areas of focus | Arithmetic teaching and practise focus (Fluency Bee) |  | Problem solving |
| $\begin{aligned} & \overline{5} \\ & \frac{5}{5} \\ & \frac{5}{4} \end{aligned}$ | Number Place value | Block 1 <br> 6 and 7 | $\begin{aligned} & \bar{\phi} \\ & \text { on } \\ & \text { 응 } \end{aligned}$ | Problem Solving Strategies Lesson Thinking about Keeping Track |
|  |  | Block 2 8 and 9 |  | $\frac{\text { Spot the Shapes } 1}{\text { MCfAP }}$ |
|  |  | $\text { Block } 3$ $10$ |  | $\frac{\text { Ladybirds in the Garden }}{\text { NRICH }}$ |
|  |  | Block 4 <br> Comparison to 10 |  | $\begin{aligned} & \text { At the Toy Shop } \\ & \text { MCfAP } \end{aligned}$ |
|  | Number Addition and subtraction | Block 5 <br> Addition and subtraction |  | Heads and Feet NRICH |
|  |  | Block 6 <br> Ten and a bit |  | $\frac{\text { A square of circles }}{\text { NZ Maths }}$ |
| $\begin{aligned} & \text { N } \\ & \stackrel{1}{5} \\ & \stackrel{5}{4} \end{aligned}$ |  |  |  | Problem Solving Strategies Lesson Thinking about working systematically |
|  |  | Block 7 <br> Comparison to 20 |  | Jack and the Beanstalk MCfAP |
|  |  | Block 1 <br> 1 more (within 20) | $\begin{aligned} & \text { N } \\ & \mathscr{1} \\ & \text { 8 } \\ & \dot{N} \end{aligned}$ | $\begin{gathered} \hline \text { Circles and Oblongs } \\ \text { NZ Maths } \\ \hline \end{gathered}$ |
|  | Geometry Shape | Block 2 <br> 1 less (within 20) |  | $\frac{\text { Triangle Animals }}{\text { NRich }}$ |
|  |  | Block 3 <br> Make connections |  | $\begin{gathered} \hline \text { Biscuit Decorations } \\ \text { NRich } \end{gathered}$ |
|  |  |  |  | Card Sharp MCfAP |
| $\begin{aligned} & \text { 이 } \\ & \text { 듬 } \\ & \text { in } \end{aligned}$ | Measurement Money | Block 4 <br> Odd and even |  | Problem Solving Strategies Lesson Thinking about looking for patterns |
|  |  |  |  | $\frac{\mathrm{Next} \mathrm{Domino}}{\mathrm{NRICH}}$ |
|  | Number Multiplication and division | Block 5 <br> Doubles to 20 |  | Multiple Madness Hamilton Trust |
|  |  |  |  | Marbles NZ Maths |
|  |  | Block 6 <br> Near doubles |  | $\frac{\text { Missina Middless }}{\text { NRICH }}$ |
|  |  | Block 7 <br> Add 2 |  | $\frac{\text { Street Sequences }}{\text { NRICH }}$ <br> Choose street rumbers appropriate to $Y_{2}$ |
| N응등 |  | Block 8 Subtract 2 |  | Problem Solving Strategies Lesson |
|  | Measurement Length and height | Block 1 <br> Add through 10 | $\begin{aligned} & \text { m } \\ & \text { \& } \\ & \text { O } \\ & \text { n } \end{aligned}$ |  |
|  | Measurement Mass, capacity and temperature | Block 2 <br> Subtract through 10 |  |  |
|  |  | Block 3 Bonds to 20 |  |  |
| $\begin{aligned} & \text { } \\ & \stackrel{\rightharpoonup}{\omega} \\ & E \\ & E \\ & \vdots \end{aligned}$ | Number Fractions | Block 1 <br> How many? | $\begin{aligned} & \dot{Z} \\ & \text { E } \\ & \text { o } \\ & \dot{\omega} \end{aligned}$ | Problem Solving Strategies Lesson |
|  |  | Block 2 <br> Comparison to 100 |  |  |
|  | "Measurement Time | Block 1 <br> Introduction to multiplication and division | $\begin{aligned} & \text { \% } \\ & \text { \% } \\ & \text { ס } \end{aligned}$ |  |
|  |  | Block 2 |  |  |
| $\begin{aligned} & \text { N } \\ & \text { E } \\ & \text { E } \\ & \text { n } \end{aligned}$ | *Statistics | The 2 times-table |  | Problem Solving Strategies Lesson |
|  | *Geometry Position and direction | Block 3 <br> The 10 times-table |  |  |
|  | Consolidation <br> *Time built in for NC tests earlier this term. | Block 4 <br> The 5 times-table |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

## Long Term Plan: Year 3

## Milestones - By the end of Year 3, children will demonstrate...

- Children in Year 3 develop fluency in using the four operations for whole numbers. They learn written methods to structure their calculations as well as becoming increasingly accurate with their mathematical reasoning.
- Count from 0 in multiples of $4,8,50$ and 100
- Find 10 or 100 more or less than a given number
- Count, read, write and order numbers to 1000 both in numerals and in words
- Add and subtract numbers mentally and using written methods up to 3 digits
- Recall and use multiplication and corresponding division facts for the 3,4 and 8 times tables
- Write and calculate multiplication and division statements using known tables, beginning with mental methods and progressing to written methods.
- Count up and down in tenths
- Recognise, find and write fractions of a set of objects or a number, including unit fractions and non-unit fractions and begin to add and subtract fractions with the same denominator within 1 whole.
- They need to use a range of measures to describe and compare different quantities such as length, mass, capacity/volume, temperature, time and money (giving change in £ and pence).
- Tell the time from an analogue clock using Roman numerals from I to XII and $12 / 24$-hour clocks.
- Know number of seconds in a minute and number of days in each moth, year and leap year.
- Recognise angles as a description of a turn and identify right angles in shapes. Know whether angles are greater than or smaller than a right angle.


## According to the National Curriculum, children should be taught:

The principal focus of mathematics teaching in lower Key Stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.

Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

The new vocabulary the Year 3 children will use will include:

|  | Tier 1 | Tier 2 | Tier 3 |
| :---: | :---: | :---: | :---: |
| Place Value | count in steps, count in multiples, place value, estimate, compare (<,>, =), placeholder, hundreds, representation | ascending, descending, 10/100 more, 10/100 less, thousands, identify, flexible partitioning | negative numbers 1000 more/less, round |
| Addition and subtraction | sum, plus, 3-digit number, commutative, inverse, missing number problem, altogether, total take away/minus | column addition/subtraction estimate | 4-digit number, operations, written methods |
| Multiplication and division | multiplication (times) tables, commutative, $x$ and $\div$ | derived facts, positive integer scaling problems, correspondence problems | factor, product, divisor, remainders |
| Fractions/Decimals /Percentages | three quarters, third, two quarters, equivalent fractions, unit/non unit fractions, numerator, denominator | tenths | decimal, equivalence, hundredths, integer |
| Measurement | standard units, estimate, order, record results, <br> kilogram (kg), gram <br> (g), half as, temperature, Celsius, quarter full, three quarters full, litres (I) millilitres (ml), intervals of time, quarter to/past, duration, $\mathrm{m} / \mathrm{cm}, \mathrm{l} / \mathrm{ml}$, degrees $\left(^{\circ}\right)$, sequence, analogue, digital, value, change | millimetre (mm), kilometre (km), Roman numerals, 12hour clock, 24-hour clock, a.m/p.m, noon, midnight, leap year, digital | convert, rectilinear figure |


| Geometry | pentagon, hexagon, <br> line of symmetry, <br> polygon, <br> quadrilateral, <br> cylinder, edges, <br> vertex/vertices, prism, <br> faces, anti-clockwise, <br> straight line, rotation <br> (turn), arrange, <br> sequences, <br> right angle (turn) | heptagon, octagon, <br> orientations, angles, <br> acute/obtuse/right <br> angles, greater/less <br> than a right angle, <br> horizontal/vertical <br> lines, perpendicular <br> lines, parallel lines, <br> ordinal | trapezium, rhombus, <br> geometric shapes, <br> grid, regular/irregular <br> (polygons), ordinal |
| :---: | :---: | :---: | :---: |
| Statistics | pictograms, tally <br> chart, block diagram, <br> category, sorting, <br> totalling, comparing, <br> tables | bar chart, one/two- <br> step problem | interpret |

In Year 3, the children will be faught:

## Number and Place Value

| Focus | Progression of skills |
| :---: | :---: |
| count | from 0 in multiples of 4, 8, 50 \& 100 |
| recognise | the place value of each digit in a three-digit number (hundreds, tens and ones) |
| Identify, represent and estimate | numbers using different representations |
| find | 10 or 100 more or less than a given number |
| compare and order | numbers up to 1000 |
| read and write | numbers up to 100 in numerals and words |
| solve | number problems and practical problems |
|  | Number - addition and subtraction |
| Focus | Progression of skills |
| Mentally add and subtract | two 2-digit numbers (answers could exceed 100) |
|  | a three-digit number and ones |
|  | a three-digit number and tens |
|  | a three-digit number and hundreds |
| Use written methods | to add and subtract numbers with up to 3 digits (column addition and subtraction) |
| estimate | the answer to a calculation |
| check answers | using inverse operations |
| solve problems | involving missing numbers |
|  | using place value |
|  | using more complex addition and subtraction |
|  | using number facts |

Skill: Add 1-digit and 2-digit numbers to 100



## Skill: Add numbers with up to three digits



$$
265+164=429
$$



Skill: Subtract 1 and 2-digit numbers to 100


65


$$
\begin{array}{r}
51 \\
65 \\
-\quad 28 \\
\hline 37 \\
\hline
\end{array}
$$



Children can use a blank number line and other representations to count on to find the total.

Encourage them to jump to multiples of 10 to become more efficient.

From Year 3, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters.

As numbers become larger, straws become less efficient.

| $265+164=429$ | Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 3 digits. <br> Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method. <br> Plain counters on a place value grid can also be used to support learning. |
| :---: | :---: |
| Skill: Subtract 1 and 2-digit numbers to 100 |  |
| 65 <br> ? <br> 28 <br> $65-28=37$ | Children can also use a blank number line to count back to find the difference. Encourage them to jump to multiples of 10 to become more efficient. <br> From Year 3, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient. |



$$
435-273=162
$$



Base 10 and place value counters are the most effective manipulative when subtracting numbers with up to 3 digits.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

## Number - multiplication and division

| Focus | Progression of skills |
| :---: | :---: |
| recall and use | multiplication and division facts for the $3 x, 4 x$ \& $8 x$ multiplication tables |
| write and calculate | mathematical statements for multiplication and division using tables that they know |
|  | mathematical statements for two-digit numbers multiplied by onedigit numbers |
| use | mental strategies progressing to written methods |
| solve problems including | missing number problems using multiplication and division |
|  | positive integer scaling problems |
|  | correspondence problems in which ' $n$ ' objects are connected to 'm' objects |

## Skill: 3 times table



Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the three times table, using concrete manipulatives to support.

Notice the odd, even, odd, even pattern using number shapes to support. Highlight the pattern in the ones using a hundred square.


| 4 | 8 | 12 | 16 | 20 |
| :---: | :---: | :---: | :---: | :---: |
| 24 | 28 | 32 | 36 | 40 |
| 44 | 48 | 52 | 56 | 60 |

-0000-0000-0000-0000-0000-


Encourage daily counting in multiples, supported by a number line or a hundred square. Look for patterns in the four times table, using manipulatives to support. Make links to the 2 times table, seeing how each multiple is double the twos.

Notice the pattern in the ones within each group of five multiples. Highlight that all the multiples are even using number shapes to support.

## Skill: 8 times table

| 8 | 16 | 24 | 32 | 40 |
| :---: | :---: | :---: | :---: | :---: |
| 48 | 56 | 64 | 72 | 80 |



Encourage daily counting in multiples, supported by a number line or a hundred square. Look for patterns in the eight times table, using manipulatives to support. Make links to the 4 times table, seeing how each multiple is double the fours.

Notice the pattern in the ones within each group of five multiples. Highlight that all the multiples are even using number shapes to support.

Skill: Multiply 2-digit numbers by 1-digit numbers


Skill: Divide 2-digits by 1-digit numbers (sharing with no exchange)


$$
48 \div 2=24
$$



When dividing larger numbers, children can use manipulatives that allow them to partition into tens and ones. Straws, Base 10 and place value counters can all be used to share numbers into equal groups.

Part-whole models can provide children with a clear written method that matches the concrete representation.

Skill: Divide 2-digits by 1-digit numbers (sharing with exchange)


When dividing numbers involving an exchange, children can use Base 10 and place value counters to exchange one ten for ten ones.

Children should start with the equipment outside the place value grid before sharing the tens and ones equally between the rows.

Flexible partitioning in a part-whole model supports this method.

Skill: Divide 2-digits by 1-digit numbers (sharing with remainders)


When dividing numbers with remainders, children can use Base 10 and place value counters to exchange one ten for ten ones.

Starting with the equipment outside the place value grid will highlight remainders, as they will be left outside the grid once the equal groups have been made.

Flexible partitioning in a part-whole model supports this method.

| Number - fractions |  |
| ---: | :--- |
| Focus | Progression of skills |
| recount | up and down in tenths |
| recognise, find and |  |
| write | that tenths arise from dividing an object into 10 equal parts and in <br> dividing one-digit numbers or quantities by 10 <br> fractions of a discrete set of objects (unit and non-unit fractions with <br> small denominators). |
| recognise and use | fractions as numbers (unit and non-unit fractions with small <br> denominators) |
| recognise and show | equivalent fractions with small denominators, using diagrams |
| add and subtract | fractions with the same denominator within one whole |
| compare and order | Unit fractions |
|  | fractions with the same denominator |
| solve problems | that involve all of the above |

## Measurement

| Focus | Progression of skills |
| :---: | :---: |
| measure, compare, add and subtract | lengths (m/cm/mm) |
|  | mass (kg/g) |
|  | volume/capacity (l/ml) |
| measure | the perimeter of simple 2-D shapes |
| add and subtract | amounts of money to give change, using £ \& p in practical contexts. |
| Tell and write the time | from an analogue clock |
|  | using roman numerals I to XII |
|  | using 12 hour and 24 hour clocks. |
| estimate and read | time with increasing accuracy to the nearest minute |
| record and compare | time, in terms of minutes, seconds and hours |
| know | the number of seconds in a minute number of days in a month number of days in a year or leap year. |
| compare | durations of events |
|  | Geometry |
| Focus | Progression of skills |
| draw or make | 2-D and 3-D shapes using modelling materials |
|  | $3-\mathrm{D}$ shapes in different orientations and describe them. |
| recognise | angles as: <br> a property of shape <br> a description of turn. |
|  | that two right angles make a half turn, three make $3 / 4$ of a turn and four right angles make a complete turn. |
|  | right angles |
| identif | whether angles are greater or less than a right angle |
|  | Statistics |
| Focus | Progression of skills |
| interpret and present data | using bar charts, pictograms, tables |
| solve | one-step and two-step questions using information presented in scaled bar charts, pictograms and tables. |

Year 3

|  | Year 3 |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Maths areas of focus | Arithmetic Practice (Speedy Maths) *indicates new content |  |  | Problem solving |
| $\begin{aligned} & - \\ & \frac{c}{E} \\ & \frac{5}{4} \end{aligned}$ | Number Place value |  | Know 2x, 5x 10x tables and related division facts at speed. | Know doubles and halves to 20. | Probiem Solving Shratoges Lesion Thinking about Keeningtrock |
|  |  | *Know 3x table at speed | Add 1-digit to 2 digit numbers Subtract 1 -digit from 2 -digit numbers | Add tens to 2-digit numbers Subtract tens from 2 -digit numbers. | Roly Poly MCfAP |
|  |  | *Know 10 more than 3digit numbers | Know 3x table at speed Know addition and subtraction facts to 20. | Know 2x, 5x 10x tables and related division facts at speed. | $\frac{\text { One of Thity-5ix }}{\text { NRICH }}$ |
|  | Number Addlition and subtraction | *Know 10 less than 3-digit numbers. | Know 3x table at speed Double and half numbers to 20 at speed. | Know 2x, 5x 10x tables and related division facts at speed. | $\frac{\text { What do you need? }}{\text { NRiCH }}$ |
|  |  | *Know 4x table at speed | Know 10 more than 3-digit numbers Know 10 less than 3 -digit numbers | Know addition and subtraction facts to 20. $2 \mathrm{x}, 5 \mathrm{x}, 10 \mathrm{x}$ tables including division facts. | $\frac{\text { Odds and Evens }}{\text { MCfAP }}$ |
|  |  | *Add two tens at speed | Know 4x table at speed Know 3x table at speed | Add and subtract 2-digit to 1-digit at speed | $\frac{\text { Eour Colours }}{\text { NRICH }}$ |
| $\begin{aligned} & \text { N } \\ & \text { ह } \\ & \frac{5}{5} \\ & \frac{5}{4} \end{aligned}$ |  |  | Add two tens at speed <br> Know $3 x$ and $4 x$ tables at speed | Know 10 more and 10 less than 3 digit numbers |  |
|  |  | *Know 6x table at speed | Add two tens at speed <br> Know pairs of numbers to 30 and 40 . | Add and subtract tens from 2-digit numbers. | $\frac{\text { Card Ticks }}{\text { MCfAP }}$ |
|  | Number Multiplication and Division A | *Add 1-digit to 3 -digit numbers | Know 3x, 4x and 6x table at speed Add two tens at speed. | Know division facts for $2 \mathrm{x}, 5 \mathrm{x}, 10 \mathrm{x}$ tables at speed. | $\frac{\text { Asquare of circles }}{\text { NZ Maths }}$ |
|  |  | *Subtract 1-digit from 3digit numbers | Know 3x and 6x tables at speed. Add two tens at speed. |  | $\frac{\text { School Fair Neckiaces }}{\text { NRich }}$ |
|  |  | "Know mixed tables 2/3/4/5/6/10 at speed. | Add 1-digit to 3-digit numbers Subtract 1 -digit from 3 -digit numbers |  | $\frac{\text { King Amold }}{\text { MCfAP }}$ |
|  |  | *Subtract two tens at speed. | Know mixed $2 \mathrm{x}, 3 \mathrm{x}, 4 \mathrm{x}, 5 \mathrm{x}, 6 \mathrm{x}, 10 \mathrm{x}$ tables af speed. | Add two tens at speed <br> Know division facts for $2 \mathrm{x}, 5 \mathrm{x}, 10 \mathrm{x}$ tables. | $\frac{\text { Ieddy Town }}{\text { NRich }}$ |
| $\begin{aligned} & \text { 잉 } \\ & \text { 등 } \end{aligned}$ | Number Multiplication and Division B |  | Know 2x, 3x, 4x, 5x, 6x, 10x tables at speed Add and subtract two tens at speed. | Know 10 more and 10 less than 3-digit numbers. |  |
|  |  | *Know $\div$ facts relating to $6 x$ table at speed. |  |  | $\frac{\text { Toothpick Squares }}{\text { NZ Matns }}$ |
|  |  | *Mentally add pairs of 2digit numbers at speed | Know division facts relating to the $6 x$ table at speed | Know 2x, 3x, 4x, 5x, 6x, 10x tables at speed. | $\frac{\text { Domino Sets }}{\text { NRICH }}$ |
|  | Measurement Length and perimeter |  | Mentally add pairs of 2-digit numbers Subtract 1-digit from 2-digit at speed | Double/half numbers to 20 . Know +/- facts to 20, Know $\div$ facts for 6 x table | $\frac{\text { Reversing Numbers }}{\text { NZ Matns }}$ |
|  |  | *Know ㄴfacts relating to 4 x table at speed. | Mentally add pairs of 2-digit numbers |  | $\frac{\text { cannon Bolls }}{\text { NZ Maths }}$ |
|  |  | "Mentally subtract pairs of 2-digit numbers. | Know pairs of numbers to 20 |  | $\frac{\text { LShaped Models }}{\text { PNS }}$ |
| N을등 | Number Fractions A |  | Mentally subtract pairs of 2-digit numbers Add 1 -digit to 3 -digit numbers | Know 2x, 3x, 4x, 5x, 6x, 10x tables Know division facts for $4 \mathrm{x}, 2 \mathrm{x}, 5 \mathrm{x}, 10 \mathrm{x}$ | Probiem solving Statogios Lesicon |
|  |  | *Know ́facts relating to $3 x$ table at speed. | Mentally add and subtract pairs of 2-digit numbers. |  |  |
|  |  | *Know pairs of numbers to 100 | Know division facts relating to 3 x table Mentally + and - pairs of 2-digit numbers. | Know 2x, 3x, 4x, 5x, 6x, 10x tables. |  |
|  | Measurement Mass and capacity |  | Know pairs of numbers to 100 Know division facts for 3x, 4x, 6x tables |  |  |
|  |  | *Know - facts for mixed tables at speed $223 / 4 / 5 / 5 / 10)$ | Know pairs of numbers to 100. Double and half numbers to 20 at speed. | Mentally add and subtract pairs of 2-digit numbers. |  |
|  |  |  | Mentally + and - pairs of 2-digit numbers + and - 1-digit and 3-digit numbers | Know 2x, 3x, 4x, 5x, 6x, 10 x tables and division facts. |  |
| $\begin{aligned} & \bar{\Phi} \\ & \stackrel{1}{6} \\ & E \\ & 5 \end{aligned}$ | Number Fractions B |  | Know 2x, 3x, 4x, 5x, 6x, 10x tables and division facts. | Know pairs of numbers to 100 | $\begin{aligned} & \text { Probiem solving Sratoóos } \\ & \hline \text { lesson } \end{aligned}$ |
|  |  | *To multiply any number by 10 at speed. | Know 2x, 3x, 4x, 5x, 6x, 10x tables and division facts. | Know pairs of numbers to 100. |  |
|  | Measurement Money | *To $\div$ numbers ending in zero by 10 at speed. | Know 2x, 3x, 4x, 5x, 6x, 10x tables and division facts. | To multiply any number by 10 at speed. |  |
|  |  | *Add tens to 3 -digit numbers at speed | To $\div$ numbers ending in zero by 10 at speed, Know pairs of numbers to 100 . | Know 2x, 3x, 4x, 5x, 6x, 10x tables and division facts. |  |
|  | Measurement Time | *Subtract tens from 3digit numbers at speed | Add tens to 3 -digit numbers at speed To $x$ and $\div$ numbers by 10 at speed. | Know 2x, 3x, 4x, 5x, 6x, 10x tables and division facts. |  |
|  |  | *To say 100 more than numbers to 3 -digit. | Subtract tens from 3-aligit numbers. Know pairs of numbers to 100 . | Know 2x, 3x, 4x, 5x, 6x, 10 x tables and division facts at speed |  |
| $\begin{aligned} & \text { N } \\ & \text { } \\ & \text { E } \\ & \text { E } \end{aligned}$ |  | *To say 100 less than numbers to 3 -digit | To say 100 more than numbers to 3 -digit. Know pairs of numbers to 20. | Know 2x, 3x, 4x, 5x, 6x, 10x tables and division facts. | Probiem Solving Srategies Lesion |
|  | Geometry Shape | "To add hundreds to 3digit numbers at speed. | To say 100 more/less than numbers to 3digit. To x and $\div$ any number by 10 | Know $2 \mathrm{x}, 3 \mathrm{x}, 4 \mathrm{x}, 5 \mathrm{x}, 6 \mathrm{x}, 10 \mathrm{x}$ tables and division facts. Know pairs of tens to 100. |  |
|  |  | *To - hundreds from 3digit numbers at speed. | To say 100 more/less than numbers to 3digit. Know pairs of numbers to 100 . | To add hundreds to 3 -digit numbers at speed Know 2x, 3x, 4x, 5x, 6x, 10x tables and $\div$ facts. |  |
|  | Statistics |  | To +/ -hundreds and 3-digit numbers and Add tens to 3 -digit numbers at speed. | Know 2x, 3x, 4x, 5x, 6x, 10x tables and division facts. |  |
|  |  | *Double and half tens at speed | Know 2x, 3x, 4x, 5x, 6x, 10x tables and $\div$ facts. Add 1's to 3 -digit numbers at speed. | Mentally add and subtract pairs of 2-digit numbers |  |
|  | Consolidation |  | Know 2x, 3x, 4x, 5x, 6x, 10x tables and division facts. +/- pairs of 2 -digit numbers. | Double and half tens at speed. |  |

## Long Term Plan: Year 4

## Milestones - By the end of Year 4, children will demonstrate...

By the end of Year 4 children have memorised the multiplication tables up to and including the $12 x$ table and use these with precision and confidence. They develop fluency in using formal written methods for addition and subtraction and develop formal written methods for multiplication and division.

- Compare and order numbers beyond 1000 and find 1000 more and less than any number
- Round any number to the nearest 10,100 or 1000
- Count from 0 in multiples of 6, 7, 9, 25 and 1000
- Recognise Roman numerals I to C
- Recall and use multiplication and division facts for tables up to $12 \times 12$
- Add and subtract 4-digit number using an efficient written method (column)
- Multiply and divide 2 and 3-digit numbers by 1 -digit numbers using a written format
- Count up and down in hundredths
- Recognise and write fractions and decimals of any number of tenths or hundredths
- Recognise and write decimal equivalents of $\frac{1}{2}, \frac{1}{4}$ and $\frac{3}{4}$
- Convert hours to minutes, minutes to seconds, years to months and weeks to days
- Solve 2-step problems involving the 4 operations and written methods where possible
- Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres
- Understand angles as the measurement of a turn. Compare acute and obtuse angles with right angles.
- Find the area of rectilinear shapes by counting squares
- Round decimals with one decimal place to the nearest whole number


## According to the National Curriculum, children should be faught:

The principal focus of mathematics teaching in lower Key Stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.

By the end of Year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication tables and show precision and fluency in their work.

Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

The new vocabulary the Year 4 children will use will include:

|  | Tier 1 | Tier 2 | Tier 3 |
| :---: | :---: | :---: | :---: |
| Place Value | ascending, descending, 10/100 more, 10/100 less, thousands, identify, flexible partitioning | negative numbers, 1000 more/less, round | ten thousands, one hundred thousands, one million |
| Addition and subtraction | column addition/subtraction estimate | 4-digit number, operations, written methods |  |
| Multiplication and division | derived facts, positive integer scaling problems, correspondence problems | factor pairs, short multiplication, factor product, divisor, remainders | common factors, dividend, quotient |
| Fractions/Decimals /Percentages | tenths | decimal, decimal places, decimal point, equivalence, hundredths, integer, convert, proper/improper fractions, mixed numbers | thousandths, per cent (\%) |
| Measurement | millimetre (mm), kilometre (km), Roman numerals, 12hour clock, 24-hour clock, a.m/p.m, noon, midnight, leap year, digital | rectilinear figure, area, perimeter, convert, decimal notation |  |
| Geometry | heptagon, octagon, orientations, angles, acute/obtuse/right angles, greater/less than a right angle, horizontal/vertical lines, perpendicular lines, parallel lines, ordinal | isosceles, equilateral, scalene, trapezium, rhombus, parallelogram, geometric shapes, co-ordinates, first quadrant, grid, translation, plot, $\mathrm{x} / \mathrm{y}$ axis, regular/irregular polygon | reflex angles |
| Statistics | bar chart, one/twostep problem | time graph, discrete/continuous data, interpret | timetable, line graph |


| In Year 4, the children will be taught: |  |
| :---: | :---: |
| Number and Place Value |  |
| Focus | Progression of skills |
| count | in multiples of 6, 7, 9, 25 and 1000 |
| count | backwards through zero to include negative numbers |
| find | 1000 more or less than a given number |
| recognise | the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) |
| order and compare | numbers beyond 1000 |
| identify, represent and estimate | numbers using different representations |
| round | any number to the nearest 10, 100 or 1000 |
| solve | number and practical problems that involve all of the above and with increasingly large positive numbers |
| read | roman numerals to $100(1$ to C) and know that over time, the numeral system changed to include the concept of zero and place value. |


| Number - addition and subtraction |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Focus | Progression of skills |  |  |  |  |
| add and subtract | numbers with up to 4 digits using the written methods of columnar addition and subtraction where appropriate |  |  |  |  |
| check answers | by estimating by using inverse operations |  |  |  |  |
| solve | two-step problems involving addition and subtraction in contexts, deciding which operations and methods to use and explaining why |  |  |  |  |
| Skill: Add numbers with up to four digits |  |  |  |  |  |
|  |  |  |  |  | Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 4 digits. <br> Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method. <br> Plain counters on a place value grid can also be used to support learning. |

## Skill: Subtract numbers with up to four digits



$$
4,357-2,735=1,622
$$



Base 10 and place value counters are the most effective manipulatives when subtracting numbers with up to 4 digits.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

| Number - multiplication and division |  |
| :---: | :---: |
| Focus | Progression of skills |
| recall | multiplication and division facts for multiplication tables up to $12 \times 12$ at speed |
| use | place value, known and derived facts to multiply and divide mentally including: <br> - multiplying by 0 and 1 ; <br> - dividing by 1 ; <br> - multiplying together three numbers |
| recognise | and use factor pairs and commutativity in mental calculations |
| use formal written layout | to multiply two-digit and three-digit numbers by a one-digit number |
| solve problems | involving multiplying and adding including: <br> - using the distributive law to multiply two-digit numbers by one digit <br> - integer scaling problems <br> - harder correspondence problems such as n objects are connected to m objects. |


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| 6 | 12 | 18 | 24 | 30 |
| :---: | :---: | :---: | :---: | :---: |
| 36 | 42 | 48 | 54 | 60 |
| 66 | 72 | 78 | 84 | 90 |

Encourage daily counting in multiples， supported by a number line or a hundred square．Look for patterns in the six times table，using manipulatives to support．Make links to the 3 times table，seeing how each multiple is double the threes．

Notice the pattern in the ones within each group of five multiples． Highlight that all the multiples are even using number shapes to support．

## Skill： 9 times table

| 9 | 18 | 27 | 36 | 45 |
| :---: | :---: | :---: | :---: | :---: |
| 54 | 63 | 72 | 81 | 90 |



Encourage daily counting in multiples both forwards and backwards．This can be supported using a number line or a hundred square．Look for patterns in the nine times table，using concrete manipulatives to support．

Notice the pattern in the tens and ones using the hundred square to support as well as noting the odd，even pattern within the multiples．

## E8K484888

| 7 | 14 | 21 | 28 | 35 |
| :---: | :---: | :---: | :---: | :---: |
| 42 | 49 | 56 | 63 | 70 |



Encourage daily counting in multiples both forwards and backwards, supported by a number line or a hundred square.

The seven times table can be trickier to learn due to the lack of obvious pattern in the numbers, however they already know several facts due to commutativity.

Children can still see the odd, even pattern in the multiples using number shapes to support.

## Skill: 11 times table



Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

Look for patterns in the eleven times table, using concrete manipulatives to support.

Notice the pattern in the tens and ones using the hundred square to support. Also consider the pattern after crossing 100.

## Skill: 12 times table

| 12 | 24 | 36 | 48 | 60 |
| ---: | :---: | :---: | :---: | :---: |
| 72 | 84 | 96 | 108 | 120 |
| 132 | 144 |  |  |  |



Encourage daily counting in multiples, supported by a number line or a hundred square. Look for patterns in the 12 times table, using manipulatives to support. Make links to the 6 times table, seeing how each multiple is double the sixes.

Notice the pattern in the ones within each group of five multiples. The hundred square can support in highlighting this pattern.

Skill: Multiply 2-digit numbers by 1-digit numbers


Informal methods and the expanded method are used in Year 3 before moving on to the short multiplication method in Year 4.

Place value counters should be used to support the understanding of the method rather than supporting the multiplication, as children should use times table knowledge.

Skill: Multiply 3-digit numbers by 1-digit numbers


When moving to 3 - digit by 1-digit multiplication, encourage children to move towards the short, formal written method. Base 10 and place value counters continue to support the understanding of the written method.

Limit the number of exchanges needed in the questions and move children away from resources when multiplying larger numbers

Skill: Divide 2-digits by 1-digit numbers (sharing with exchange)


Skill: Divide 2-digits by 1-digit numbers (sharing with remainders)


When dividing numbers with remainders,
children can use Base 10 and place value counters to exchange one ten for ten ones.

Starting with the equipment outside the place value grid will highlight remainders, as they will be left outside the grid once the equal groups have been made.

Flexible partitioning in a part-whole model supports this method.

Skill: Divide 3-digits by 1-digit numbers (sharing)


Children can continue to use place value counters to share 3digit numbers into equal groups.

Children should start with the equipment outside the place value grid before sharing the hundreds, tens and ones equally between the rows. This method can also help to highlight remainders.

Flexible partitioning in a part-whole model supports this method.

## Number - fractions including decimals

| Focus | Progression of skills |
| :---: | :---: |
| count | up and down in hundredths |
| recognise | families of common equivalent fractions and show these using diagrams |
|  | that hundredths arise when dividing an object by one hundred and dividing tenths by ten |
| recognise and write | decimal equivalents of any number of tenths or hundredths |
|  | decimal equivalents to one quarter, one half and three quarters |
| add and subtract | fractions with the same denominator |
| find | the effect of dividing a one-digit or two-digit number by 10 and 100 identifying the value of the digits in the answer as ones, tenths and hundredths |
| round | decimals with one decimal place to the nearest whole number |
| compare | numbers with the same number of decimal places up to two decimal places |
| solve problems | involving: <br> - increasingly harder fractions to calculate quantities; <br> - fractions to divide quantities including non-unit fractions where the answer is a whole number |
|  | simple measure and money problems involving fractions and decimals to two decimal places |


| Measurement |  |  |  |
| ---: | :--- | :---: | :---: |
| Focus | Progression of skills |  |  |
| convert | between different units of measure [for example, kilometre to metre; <br> hour to minute] |  |  |
| measure and <br> calculate | the perimeter of a rectilinear figure (including squares) in <br> centimetres and metres |  |  |
| the area of rectilinear shapes by counting squares |  |  |  |
| estimate, compare <br> and calculate | different measures, including money in pounds and pence |  |  |
| read, write and <br> convert | time between analogue and digital 12- and 24-hour clocks |  |  |
| Solve problems | involving converting from hours to minutes; minutes to seconds; years <br> to months; weeks to days. <br> Geometry - properties of shape |  |  |
| Focus | Progression of skills |  |  |
| compare and |  |  |  |
| classify |  |  |  | | geometric shapes, including quadrilaterals and triangles, based on |
| :--- |
| their properties and sizes |

## Geometry - position and direction

| Focus | Progression of skills |
| :---: | :---: |
| describe | positions on a 2-D grid as coordinates in the first quadrant |
|  | movements between positions as translations of a given unit to the left/right and up/down |
| plot | specified points and draw sides to complete a given polygon. |
|  | Statistics |
| Focus | Progression of skills |
| interpret and present | discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. |
| solve problems | using information presented in bar charts, pictograms, tables and other graphs which involve: <br> - comparison <br> - sum <br> - difference |


|  | Year 4 |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Maths areas of focus | Arithmetic Practice (Speedy Maths) *indicates new content |  |  | Problem solving |
| $\begin{aligned} & \bar{E} \\ & \frac{5}{5} \\ & \frac{5}{4} \end{aligned}$ | Number Place value |  | Know 2/3/4/5/6/10x tables and related facts at speed. Add pairs of tens at speed. | Know 10/100 more/less than 3-digit numbers. Add pairs of 2 -digit numbers $+/-1$-digit and 3 -digit numbers. |  |
|  |  |  | Know 2/3/4/5/6/10x tables and related facts at speed. Know pairs of numbers to 100. | Add 1-digit to 3 -digit numbers Know 100 more than any number. | $\frac{\text { Lianthouses }}{\text { MCfAP }}$ |
|  |  | *Know 9x table at speed | Add and subtract pairs of 1-digit and 2-digit numbers Know doubles and halves of tens | +/- 1-digit numbers and 3-digit numbers. <br> Know pairs of numbers to 100 . | $\frac{\text { Straw Squares }}{\text { MCfAP }}$ |
|  |  | *Know pairs of tens to 90 | Know 9x tables at speed and related $\div$ facts for $2 \mathrm{x}, 3 \mathrm{x}, 4 \mathrm{x}, 5 \mathrm{x}, 6 \mathrm{x}, 10 \mathrm{x}$ at speed. | Add hundreds to 3 -digit numbers at speed. Know doubles and halves of tens. | $\begin{aligned} & \text { Sitting Round the } \\ & \text { Rartv Tables NRICH } \end{aligned}$ |
|  | Number Addition and subtraction | *Know 7x table at speed | Know 2/34/5/6/10x tables and related facts at speed. Know 9x table at speed. | x and $\div$ any number by 10 , Know pairs of tens to $90,+/$ - tens with 3 -digit numbers | $\frac{\text { Zios and }}{\text { NRICHts }}$ |
|  |  |  | Know 7x/9x table at speed. <br> +/- pairs of 2 -digit numbers at speed. | Know halves and doubles of numbers to 20. Know number bonds to 20. | $\frac{\text { Athousond seconds }}{\text { NZ Maths }}$ |
| $\begin{aligned} & \text { N } \\ & \text { ह } \\ & 5 \\ & \frac{5}{4} \end{aligned}$ |  | *Know 8x table at speed | Add and subtract hundreds and 3-digit numbers. Know pairs of numbers to 100 . | Know 2/3/4/5/6/10x tables and related $\div$ facts at speed. Divide any number by 10 . |  |
|  | Measurement Area | *Give change from $£ 1$ at speed | Know 2/3/4/5/6/10x tables and related facts at speed. Know 8x table at speed. | Add and subtract tens with 3-digit numbers at speed. Know pairs of tens to 90 . | $\frac{\text { Three in a Line }}{\text { NZ Maths }}$ |
|  | Number Multiplication and division A | *Know 11x table at speed | Know 2/3/4/5/6/10x tables and related facts at speed. Give change from $£ 1$ at speed. | Know 7x, 8x, 9x table at speed. +/-pairs of 2-digit numbers at speed. | $\frac{\text { Super Darts }}{\text { NZ Maths }}$ |
|  |  | "Know pairs of numbers to 90 | Know 7/8/9/11x tables and 2/3/4/5/6/10x tables and related $\div$ facts at speed. | Know number bonds to 20 and related facts at speed. | $\frac{\text { Three Monkeys }}{\text { MCfAP }}$ |
|  |  | "Know 12x table at speed | Give change from $£ 1$ at speed Know pairs of numbers to 90 . |  | $\frac{\text { Five Coins }}{\text { NRich }}$ |
|  | Consolidation |  | +/- pairs of 2-digit numbers at speed. Know pairs of numbers to 100 . |  | $\begin{aligned} & \frac{\text { Half Time }}{\text { NRich }} \end{aligned}$ |
| $\begin{aligned} & \text { 인 } \\ & \text { 듬 } \end{aligned}$ | Number Multiplication and division B | *Continue simple number patterns | Know 2/3/4/5/6/10x tables and related facts at speed. | Give change from $£ 1$ at speed. |  |
|  |  | ${ }^{*}$ Know all tables mixed at speed. | Continue simple number patterns Know pairs of numbers to 90 . | Add and subtract pairs of 2-digit numbers at speed. | $\frac{\text { Jo's Table }}{\text { NZ Matns }}$ |
|  |  | *Know simple equivalent fractions | Know all tables mixed at speed. Know pairs of numbers to 100 . | Continue simple number patterns | Unroveling sequences NPICH |
|  | Measurement Length and perimeter | *Know pairs of tens to 180 | Know simple equivalent fractions <br> +/- pairs of 2-digit numbers at speed. | Know simple equivalent fractions. Know all tables mixed at speed. |  |
|  |  | ${ }^{*}$ Convert cm to m and vice versa | Know pairs of numbers to 100 and pairs of tens to 180. | Know all tables and $\div$ facts for $2 \mathrm{x}, 3 \mathrm{x}, 4 \mathrm{x}, 5 \mathrm{x}$, $6 x, 10 x$ at speed. Continue simple patterns. | $\frac{\text { Trianaular Numbers }}{\text { NZ Matns }}$ |
|  | Number Fractions |  | Know all tables mixed at speed. Convert cm to m and vice versa | Continue simple number patterns | $\frac{\text { Race to } 100}{\text { Nz Matns }}$ |
| N을응 |  | "Know division facts for 9x table at speed. | Add and subtract pairs of 2-digit numbers at speed. Know pairs of tens to 180. |  | Probiem saving sstatoges |
|  |  | *Use tables facts to work out related x at speed. | Know simple equivalent fractions Know pairs of numbers to 90 . |  |  |
|  |  | ${ }^{*}$ Know division facts for $7 x$ table at speed. | Convert cm to m and vice versa Continue simple number patterns | Use tables facts to work out related x at speed. Know pairs of tens to 180. |  |
|  | Number Decimals A | ${ }^{*}$ Convert cm to mm and vice versa | Continue simple number patterns Know pairs of numbers to 100. |  |  |
|  |  | *Know division facts for $8 x$ table at speed. | Know simple equivalent fractions Give change from $£ 1$ at speed | Use tables facts to work out related x at speed. Convert cm to mm and vice versa. |  |
|  |  |  | $+/$ - pairs of 2-digit numbers at speed. Know pairs of tens to 180. | Use tables facts to work out related x at speed. Convert cm to mm and vice versa. |  |
| $\begin{aligned} & \text { E } \\ & \text { E } \\ & \text { E } \end{aligned}$ | Number Decimals B |  | Know all tables to $12 \times 12$ at speed. Add three 1 -aigit numbers at speed. | Use tables facts to work out related x at speed. | Probiem salving Sratogies Lesion |
|  |  | *Know division facts for 11x table at speed. | Know pairs of numbers to 100 . Give change from $£ 1$ at speed | Know pairs of tens to 180 <br> Add three 1-digit numbers at speed. |  |
|  | Measurement Money |  | Add and subtract pairs of 2-digit numbers at speed. Convert cm to mm and vice versa. | Use tables facts to work out related x at speed. |  |
|  |  | *Add three tens at speed. | Know pairs of numbers to 90 Add 3 1-digit numbers at speed | Continue simple number patterns |  |
|  | Measurement Time | "Know division facts for $12 x$ table at speed. | Add and subtract pairs of 2-digit numbers at speed. | Know pairs of tens to 180 Add three tens at speed. |  |
|  |  |  | Give change from $£ 1$ at speed | Use tables facts to work out related x at speed. |  |
| $\begin{aligned} & \text { N } \\ & \text { n } \\ & \text { E } \\ & \text { E } \end{aligned}$ | Consolidation |  | Add and subtract pairs of 2-digit numbers at speed. Add three tens at speed. | Convert cm to mm and vice versa Continue simple number patterns | Probiem solving Sratoges |
|  | Geometry Shape | *Know all tables to $12 \times 12$ and $\div$ facts at speed. | Know pairs of numbers to 100 . <br> Add 3 1-digit numbers at speed. | Use tables facts to work out related x at speed. |  |
|  |  |  | Know all tables to $12 \times 12$ including division facts at speed. Know pairs of tens to 180. | Add and subtract pairs of 2-digit numbers at speed. Know pairs of numbers to 90 . |  |
|  | Statistics | *Use tables to work out related x and $\div$ at speed. | Know all tables to $12 \times 12$ including division facts at speed. | Know pairs of numbers to 100 . Give change from £1 at speed |  |
|  | Geometry Position and direction |  | Know all tables to $12 \times 12$ including division facts at speed. | +/-pairs of 2-digit numbers at speed. Use tables facts to work out related x at speed. |  |
|  |  |  | Know all tables to $12 \times 12$ including division facts at speed. Add three tens at speed. |  |  |

## Long Term Plan: Year 5

## Milestones - By the end of Year 5, children will demonstrate...

By the end of Year 5 children are fluent in using written methods for all four operations. They make decisions about how to approach problems and work with whole and decimal numbers.

- Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit count forwards or backwards in steps of powers of 10 for any given number up to 1.000,000
- Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero.
- Round any number up to $1,000,000$ to the nearest $10,100,1,000,10,000$ and 100,000
- Read Roman numerals to , 1000 (M) and recognise years written in Roman numerals
- Add and subtract whole numbers with more than 4 digits, using formal written methods
- Solve addition and subtraction multi-step problems in context (such as length, money, mass and volume) deciding which operations and methods to use and why. They will use knowledge of factors, multiple, squares, cubes and scaling by simple fractions.
- Identify multiples and factors, including factor pairs of a number and common factors of two numbers
- Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.
- Establish whether a number to 100 is prime and recall prime numbers to 19.
- Multiply numbers up to 4-digits by a 1 or 2-digit number using a formal written method (long multiplication for 2-digit numbers)
- Divide numbers up to 4-digits by a 1 -digit number using a formal written method (short division) interpreting remainders appropriately for the context.
- Recognise and use square and cube numbers and their respective notation ( ${ }^{2}$ and ${ }^{3}$ )
- Compare, order, add and subtract fractions whose denominators are all multiples of the same number
- Recognise mixed numbers and improper fractions and convert from one to the other
- Calculate and compare area using standard units ( $\mathrm{cm}^{2}$ and $\mathrm{m}^{2}$ )
- Know that angles are measured in degrees. Estimate and compare acute, obtuse and reflex angles.
- 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.


## According to the National Curriculum, children should be taught:

The principal focus of mathematics teaching in upper Key Stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.

At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

Pupils should read, spell and pronounce mathematical vocabulary correctly.

The new vocabulary the Year 5 children will use will include:

|  | Tier 1 | Tier 2 | Tier 3 |
| :---: | :---: | :---: | :---: |
| Place Value | negative numbers, 1000 more/less, round | ten thousands, one hundred thousands, powers of, one million | millions, ten millions |
| Addition and subtraction | 4-digit number, operations, written methods |  |  |
| Multiplication and division | factor pairs, short multiplication, factor product, divisor, remainders | prime numbers, prime factors, composite numbers, square numbers ( ${ }^{2}$ ), cube numbers (3), short division, common factors, long multiplication, division bracket | long division, multi-digit number |
| Fractions/Decimals /Percentages | decimal, decimal places, decimal point, equivalence, hundredths, integer, convert, proper/improper fractions, mixed numbers | thousandths, per cent \%, complements, proportions | percentages |
| Measurement | rectilinear figure, area, perimeter, convert, decimal notation |  |  |
| Geometry | isosceles, equilateral, scalene, trapezium, rhombus, parallelogram, geometric shapes, co-ordinates, first quadrant, grid, translation, plot, $x / y$ axis, regular/irregular polygon | translation, reflection, square $\left(\mathrm{cm}^{2} / \mathrm{m}^{2}\right)$, <br> volume ( $\mathrm{cm}^{3} / \mathrm{m}^{3}$ ), metric/imperial units, inches (in), pounds (lb), pints (pt), <br> reflex angles, angles on a straight line, angles around a point, missing angles, protractor, diagonals | radius, diameter circumference |
| Statistics | time graph, discrete/continuous data, interpre $\dagger$ | timetable, comparison problems, sum problems, difference problems, line graph | pie chart, mean, average, data set |

In Year 5, the children will be faught:
Number and Place Value

| Focus | Progression of skills |
| :---: | :---: |
| count | in steps of powers of 10 for any given number up to at least 1000000 forwards or backwards |
|  | forwards and backwards with positive and negative whole numbers including through zero |
| round | any number to (up to 1000000 ) to the nearest 10, 100, 1000, 10000 , 100000 |
| read, write, compare and order | numbers up to at least 1000000 determining the place value of each digit |
| interpret | negative numbers in context |
| read | roman numerals to $1000(\mathrm{M})$ and recognise years written in roman numerals |
| solve problems | using all of the above (number and practical problems) |
|  | Number - addition and subtraction |
| Focus | Progression of skills |
| add and subtract | whole numbers with more than four digits |
|  | using columnar addition and subtraction where appropriate (written method) |
|  | using mental methods with increasingly large numbers |
| use rounding | to check answers |
|  | to determine levels of accuracy in the context of a problem |
| solve problems | multi-step addition and subtraction problems in context |
|  | decide which operations and methods to use and why |

Skill: Add numbers with more than four digits


Place value counters or plain counters on a place value grid are the most effective concrete resources when adding numbers with more than 4 digits.

At this stage, children should be encouraged to work in the abstract, using the column method to add larger numbers efficiently.


Place value counters and plain counters on a place value grid are the most effective manipulatives when adding decimals with 1,2 and then 3 decimal places.

Ensure children have experience of adding decimals with a variety of decimal places. This includes putting this into context when adding money and other measures.

Skill: Subtract numbers with more than four digits


$$
294,382-182,501=111,881
$$



Place value counters or plain counters on a place value grid are the most effective concrete resource when subtracting numbers with more than 4 digits.

At this stage, children should be encouraged to work in the abstract, using column method to subtract larger numbers efficiently.

Skill: Subtract with up to 3 decimal places


Place value counters and plain counters on a place value grid are the most effective manipulative when subtracting decimals with 1, 2 and then 3 decimal places.

Ensure children have experience of subtracting decimals with a variety of decimal places. This includes putting this into context when subtracting money and other measures

| Focus | Progression of skills |
| :---: | :---: |
| identify | multiples and factors |
|  | all factor pairs for a number |
|  | all common factors for two numbers |
| know | and use the vocabulary of prime numbers, prime factors and composite (non-prime numbers) |
|  | all prime numbers to 19 |
|  | how to establish whether a number up to 100 is prime |
| multiply | numbers up to 4-digits by 1-digit or 2-digit numbers using a formal written method including long multiplication for 2-digit numbers |
|  | Mentally by drawing upon known facts |
| divide | numbers up to 4-digits by a one-digit number using formal written method (short division) |
|  | interpret remainders appropriately for the context |
| multiply and divide | whole numbers and decimals by 10, 100, 1000 |

Skill: Multiply 4-digit numbers by 1-digit numbers

$1,826 \times 3=5,478$


When multiplying 4- digit numbers, place value counters are the best manipulative to use to support children in their understanding of the formal written method.

If children are multiplying larger numbers and struggling with their times tables, encourage the use of multiplication grids so children can focus on the use of the written method.
Skill: Multiply 2-digit numbers by 2-digit numbers



$$
234 \times 32=7,488
$$

| $\times$ | 200 | 30 | 4 |
| :---: | :---: | :---: | :---: |
| 30 | 6,000 | 900 | 120 |
| 2 | 400 | 60 | 8 |

Children can continue to use the area model when multiplying 3- digits by $2-$ digits. Place value counters become more efficient to use but Base 10 can be used to highlight the size of numbers.

Children should now move towards the formal written method, seeing the links with the grid method.

Skill: Multiply 4-digit numbers by 2-digit numbers


Skill: Divide 3-digits by 1-digit numbers (grouping)


Children can continue to use grouping to support their understanding of short division when dividing a 3 -digit number by a 1 -digit number.

Place value counters or plain counters can be used on a place value grid to support this understanding.

Children can also draw their own counters and group them through a more pictorial method.

Skill: Divide 4-digits by 1-digit numbers (grouping)

$8,532 \div 2=4,266$
Place value counters or plain counters can be used on a place value grid to support children to divide 4 - digits by 1-digit. Children can also draw their own counters and group them through a more pictorial method.

Children should be encouraged to move away from the concrete and pictorial when dividing numbers with multiple exchanges.

| Focus | Progression of skills |
| :---: | :---: |
| compare and order | fractions whose denominators are all multiples of the same number |
| identify, name and write | equivalent fractions of a given fraction represented visually including tenths and hundredths |
| recognise | mixed numbers and improper fractions and convert from one to the other |
| write | mathematical statements >1 as a mixed number e.g. $\frac{2}{5}+\frac{4}{5}=\frac{6}{5}=1 \frac{2}{5}$ |
| add and subtract | fractions with the same denominator |
|  | fractions where the denominators are multiples of the same number |
| multiply | proper fractions and mixed numbers by whole numbers supported by materials and diagrams |
| read and write | decimal numbers as fractions |
| recognise and use | thousandths and relate them to tenths, hundredths and decimal equivalents |
| round | numbers with 2 decimal places to the nearest whole number, and to 1 decimal place |
| read, write, order and compare | numbers with up to 3 decimal places |
| recognise | the per cent symbol (\%) |
| understand | that per cent relates to the number of parts per hundred |
| write | percentages as a fraction with denominator 100 |
|  | percentages as a decimal |
| solve problems | involving numbers up to 3 decimal places |
|  | Requiring knowledge of decimal and percentage equivalents of $1 / 2$, $1 / 4^{\prime}, 1 / 5^{2} / 5,4 / 5$ and those fractions with a denominator of a multiple of 10 or 25 . |

## Measurement

| Focus | Progression of skills |
| :---: | :---: |
| convert | between different units of measurement (e.g. km and m; cm and m; g and kg ; litre and ml ) |
| understand and use | approximate equivalences between metric and common imperial units (inches, pounds, pints, miles) |
| measure and calculate | the perimeter of composite rectilinear shapes in cm and m |
| calculate and compare | area of rectangles (including squares) using $\mathrm{cm}^{2}$ and $\mathrm{m}^{2}$ |
| estimate | area of irregular shapes |
|  | volume and capacity |
| Solve problems | involving: <br> - converting between units of time <br> - using all four operations and involving measure (length, mass, volume, money, time) <br> - using decimal notation, <br> - including scaling |
|  | Geometry |
| Focus | Progression of skills |
| identify | 3-D shapes, including cubes and cuboids from 2-D representations |
|  | angles at a point and one whole turn (360 $)$ |
|  | angles at a point on a straight line and $1 / 2$ a turn ( $180^{\circ}$ ) |
|  | other multiples of $90^{\circ}$ |
| know | angles are measured in degrees |
| estimate and compare | acute, obtuse and reflex angles |
| draw | given angles and measure them in degrees |
| deduce | related facts from properties of rectangles finding missing lengths and angles |
| distinguish | between regular and irregular polygons based on reasoning about equal sides and angles |
| identify, describe and represent | position of a shape following a reflection or translation: <br> - using appropriate language including coordinates in the first quadrant <br> - knowing that the shape has not changed. |
|  | Statistics |
| Focus | Progression of skills |
| solve problems | comparison, sum and difference problems using information presented in a line graph |
| complete, read and interpret | information in tables, including timetables |


|  | Year 5 |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Maths areas of focus | Arithmetic Practice (Speedy Maths) *indicates new content |  |  |  | Problem solving |
| - | Number Place Value |  | Know all tables to $12 \times 12$ including division facts at speed. Convert cm to m . |  | Know pairs of numbers to 100 Add and subtract pairs of 2-digit numbers. |  |
|  |  |  | Know all tables to $12 \times 12$ including division facts at speed. |  | Add and subtract pairs of 2-digit numbers at speed. Know pairs of numbers to 100 . | $\begin{aligned} & \text { Area and Perimeter } \\ & \text { NRICH } \end{aligned}$ |
|  |  |  | Add and subtract pairs of 2-digit numbers at speed. Know pairs of numbers to 100 . |  | Use tables to work out related x and $\div$ at speed. Continue simple number patterns | $\frac{\text { Make } 5 \text { Numbers }}{\text { MCfAP }}$ |
|  | Number Addition and subtraction |  | Give change from £1 at speed Know pairs of tens to 180 |  | Add three tens at speed. Convert cm to mm and vice versa | $\frac{\text { Half Time }}{\text { NRich }}$ |
|  |  | "Know pairs of numbers to 180. | Add and subtract pairs of 2-digit numbers at speed. Continue simple number patterns |  | Use tables to work out related x and $\div$ at speed. | $\frac{\text { Soot the Shapes } 2}{\text { MCfAP }}$ |
|  | Number Multiplication and division A | ${ }^{*}$ Convert $m$ to $k m$ and vice versa | Know all tables to $12 \times 12$ including division facts at speed. Know pairs of numbers to 90 . |  | Know pairs of numbers to 180. Convert cm to m and vice versa | $\frac{\text { Peter's String }}{\text { NZ Maths }}$ |
| $\begin{gathered} \text { N } \\ \frac{1}{E} \\ \frac{D}{3} \end{gathered}$ |  |  | Convert m to km and vice versa Know pairs of numbers to 100. |  | Use tables to work out related x and $\div$ at speed. |  |
|  |  | *Convert L to ml and vice versa | +/-pairs of 2 -digit numbers at speed. Give change from $£ 1$ at speed. Add three tens at speed. |  | Convert m to km and vice versa, Continue simple number patterns. | $\frac{\text { Three Digits }}{\text { MCfAP }}$ |
|  | Number Fractions A | *Know pairs of hundreds to 1000 . | Know all tables to $12 \times 12$ including division facts at speed. Know pairs of numbers to 180 . |  | Convert cm to mm and vice versa Convert L to ml and vice versa | $\frac{\text { Make } 37}{\text { NRich }}$ |
|  |  | "Add 2-digit to 3-digit numbers | +/- pairs of 2-digit numbers at speed. Know pairs of hundreds to 1000 and pairs of numbers to 180. |  | Know all tables to $12 \times 12$ including $\div$ facts at speed. Convert cm to m and vice versa | $\frac{\text { Sticks investigation }}{\text { Twinkl }}$ |
|  |  |  | Know all tables to $12 \times 12$ including division facts at speed. |  | Use tables to work out related x and $\div$ at speed. Add 2-digit to 3 -digit numbers. | $\begin{gathered} \text { Darts } \\ \text { Nz Maths } \end{gathered}$ |
|  |  | +/- pairs of 2-digit numbers at speed. Add three tens at speed. Convert L to ml and vice versa. |  | Know pairs of numbers to 90 and pairs of hundreds to 1000. Use tables to work out related x and $\div$ at speed. |  | $\frac{\text { Button Up Some More }}{\text { NRich }}$ |
| 한흥 | Number Multiplication and division B | Know pairs of number/hundreds to 100 . Add 2-digit to 3 -digit numbers |  | Use tables to work out related x and $\div$ at speed. Convert cm to mm and vice versa |  |  |
|  |  | Add and subtract pairs of 2-digit numbers at speed. Convert cm to m and vice versa. |  | Know all tables to $12 \times 12$ including division facts at speed. Know pairs of numbers to 180. |  | $\frac{\text { Times Tables Shifts }}{\text { NRICH }}$ |
|  |  | Know all tables to $12 \times 12$ including $\div$ facts at speed. Convert L to ml and vice versa |  | Subtract 2-dig from 3 -dig numbers. Use tables to work out related x and $\div$ at speed. |  | $\frac{\text { Shakina Hands }}{\text { Nz Matns }}$ |
|  | Number Fractions B | Convert m to km and vice versa. Know pairs of hundreds to 1000. Continue simple number patterns. |  | Subtract 2-dig from 3 -dig numbers. Give change from $£ 1$ at speed. |  | $\frac{\text { Window Framas }}{\text { NRICH }}$ |
|  |  | +/- pairs of 2-digit numbers at speed. <br> $+/-2$-digit and 3 -digit numbers at speed. |  | Convert m to km and vice versa. Convert L to ml and vice versa. Add $p$ to $£ \& p$. |  | $\frac{\mathrm{Nicem} \text { or } \mathrm{Nasty}}{\mathrm{NRICH}}$ |
|  | Number Decimals and percentages | Know pairs of numbers to 180 . Use tables to work out related x and $\div$ at speed. Add p to $£ \& \mathrm{p}$. |  | +/- 2-digit and 3 -digit numbers at speed. Subtract $p$ from <br> £. Add three tens at speed. |  | $\frac{\text { Sara's Table }}{\text { NZ Matns }}$ |
| N을흥 |  | +/- pairs of 2-digit numbers at speed. +/- 2-dig and 3-dig numbers at speed. Continue simple number patterns. |  | Know all tables to $12 \times 12$ including division facts at speed. Convert L to ml and vice versa. Subtract p from $£ \& \mathrm{p}$. |  | Prodiom solvng Stratoges |
|  |  | +/- pairs of 2-digit numbers at speed. Add and subtract $p$ from $£ \&$ p |  | Convert m to km and vice versa |  |  |
|  | Measures Perimeter and area | Know all tables to $12 \times 12$ including division facts at speed. $+/-$ p from \&\&p. Know pairs of numbers to 100. |  | Convert L to ml and vice versa Use tables to work out related $x$ and $\div$ at speed. |  |  |
|  |  | Give change from $£ 1$ at speed. Convert cm to mm and vice versa. Know pairs of numbers to 180 . |  | Add and subtract 2-dig and 3-dig numbers at speed. Continue simple number patterns. |  |  |
|  | Statistics | +/- pairs of 2 -digit numbers at speed. +/- p from $£ \&$ p. Know pairs of hundreds to 1000 . |  | Know all tables to $12 \times 12$ including division facts at speed. Know pairs of numbers to 90 . |  |  |
|  |  | Know pairs of numbers to 90 Convert L to ml and vice versa |  | Add three tens at speed. Add and subtract $p$ from $£ \& p$ |  |  |
| $\begin{aligned} & \text { E } \\ & \text { E } \\ & 5 \\ & 5 \end{aligned}$ | Geometry Shape | Know all tables to $12 \times 12$ including $\div$ facts at speed. Convert cm to mm and vice versa |  | +/- 2-dig and 3 -dig numbers at speed. Add three tens at speed. Convert L to ml and vice versa. |  | $\xrightarrow{\text { Probiom Solvng Strateges }}$ |
|  |  | +/- pairs of 2-digit numbers at speed. Convert m to km and vice versa |  | Know all tables to $12 \times 12$ including division facts at speed. <br> + and - $p$ from £\&p |  |  |
|  |  | $+/-2$-digit and 3 -digit numbers at speed. Continue simple number patterns. Know number bonds to 1000 (tens). |  | Know all tables to $12 \times 12$ including aivision facts at speed. Know pairs of numbers to 100 . |  |  |
|  | Geometry Position and direction | $+/$ - pairs of 2-digit numbers at speed. Know pairs of numbers to 180 . + /- p from £\&p. |  | Convert L to ml and vice versa. $+/-2$-digit and 3 -digit numbers at speed. |  |  |
|  |  | Know pairs of numbers to 100 . +/- pairs of 2 -digit numbers at speed. |  | Convert m to km and vice versa. |  |  |
|  | Number Decimals | Give change from $£ 1$ at speed. Know number bonds to 1000 (tens). |  | Know all tables to $12 \times 12$ including division facts at speed. Know pairs of numbers to 90 . |  |  |
| $\begin{aligned} & \text { N } \\ & \text { E } \\ & \text { E } \end{aligned}$ |  | +/- 2-digit and 3-digit numbers at speed. Continue simple number patterns. |  | Know pairs of numbers to 90 . Convert m to km and vice versa. +/- p from £\&p |  | Prociom solung Strategios |
|  |  | +/- pairs of 2-digit numbers at speed. Convert L to ml and vice versa |  | $+/-2$-digit and 3 -digit numbers at speed. Add three tens at speed. |  |  |
|  | Number Negative numbers | Know all tables to $12 \times 12$ including division facts at speed. Convert cm to m and vice versa |  | $+/-3$-digit and 1 -digit numbers. Give change from $£ 1$ at speed. Add three 1 -digit numbers at speed. |  |  |
|  | Measurement Converling units | Know pairs of numbers to 180. <br> Add and subtract 2 -digit and 3 -digit numbers at speed. |  | Add and subtract $p$ from £\&p |  |  |
|  |  | +/- pairs of 2-digit numbers at speed. Convert m to km and vice versa. Add three 1 -digit numbers at speed. |  | +/- 2-digit and 3-digit numbers at speed. <br> Know all tables to $12 \times 12$ including division facts at speed. |  |  |
|  | Measurement Volume | Know all tables to $12 \times 12$ including division facts at speed. Know number bonds to 1000 (tens) |  | Add and subtract 2 -digit and 3 -digit numbers at speed. Add and subtract $p$ from $£ \& p$ |  |  |

## Long Term Plan: Year 6

## Milestones - By the end of Year 6, children will demonstrate...

Children in Year 6 apply their mathematical skills and knowledge to solve increasingly complex problems. They explain their thinking and move fluently between contexts seeking patterns, testing conjectures and approaching confidently from different angles.

- Use negative numbers in context, and calculate intervals across zero
- Round any whole number to a required degree of accuracy
- Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts
- Use common factors to simplify fractions; use common multiples to express fractions in the same denomination
- Solve problems involving the calculation of percentages [for example, of measures, and such as $15 \%$ of 360] and the use of percentages for comparison
- Multiply 1-digit numbers with up to two decimal places by whole numbers
- Perform mental calculations, including with mixed operations with large numbers
- Divide numbers up to 4 digits by a two-digit number using the written method of short division where appropriate, interpreting remainders according to the context
- Use knowledge of the order of operations to carry out calculations involving the four operations
- Use knowledge of order of operations to carry out calculations involving all four operations
- Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
- Multiply simple pairs of proper fractions by whole numbers [for example, $1 / 3 \div 2=1 / 6$ ]
- Associate a fraction with division and calculate decimal fraction equivalents for example, 0.375 for a simple fraction for example, $3 / 8$
- Express missing number problems algebraically
- Find pairs of numbers that satisfy number sentences involving two unknowns


## According to the National Curriculum, children should be taught:

The principal focus of mathematics teaching in upper Key Stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.

At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

By the end of Year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages. Pupils should read, spell and pronounce mathematical vocabulary correctly.

The new vocabulary the Year 6 children will use will include:

|  | Tier 1 | Tier 2 | Tier 3 |
| :---: | :---: | :---: | :---: |
| Place Value | ten thousands, one hundred thousands, powers of, one million | millions, ten millions |  |
| Multiplication and division | prime numbers, prime factors, composite numbers, square numbers ( ${ }^{2}$ ), cube numbers (3), short division, common factors, long multiplication, division bracket | multi-digit number, long division | order of operations, dividend, quotient, |
| Fractions/Decimals /Percentages | thousandths, per cent \%, complements, proportions |  | highest common factor, lowest common multiple, lowest common denominator |
| Ratio and proportion |  | relative size, missing values, integer multiplication, percentages, scale factor, unequal sharing and grouping | proportion, notation, enlarge, enlargement |
| Algebra |  | formulae, linear number, algebraically, equation, unknowns, combinations, variables | rule, term, substitute, generalise |
| Geometry | translation, reflection, square ( $\mathrm{cm}^{2} / \mathrm{m}^{2}$ ), volume ( $\mathrm{cm}^{3} / \mathrm{m}^{3}$ ), metric/imperial units, inches (in), pounds (lb), pints (pt), <br> reflex angles, angles on a straight line, angles around a point, missing angles, protractor, diagonals | radius, diameter, circumference, vertically opposite, four quadrants, co-ordinate plane | dimensions, isometric, concentric, vertically opposite angles |
| Statistics | timetable, comparison problems, sum problems, difference problems, line graph | pie chart, mean, average, data set | sectors, frequency, category |

In Year 6, the children will be faught:

## Number and Place Value

| Focus | Progression of skills |
| :---: | :---: |
| read, write, order and compare | numbers up to 10000000 and determine the value of each digit. |
| round | any whole number to a required degree of accuracy |
| use | negative numbers in context including calculating intervals across zero |
| solve | number and practical problems that involve all of the above. |
| Number - addition, subtraction, multiplication and division |  |
| Focus | Progression of skills |
| multiply | multi-digit numbers up to 4 digits by a 2-digit whole number using the written method of long multiplication. |
| divide | numbers up to 4 digits by a two-digit whole number using the written method of long division |
|  | interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context. |
|  | numbers up to 4 digits by a two-digit number using the written method of short division where appropriate, interpreting remainders according to the context |
| mentally calculate | including with mixed operations and large numbers |
| identify | common factors, common multiples and prime numbers |
| use | knowledge of the order of operations to carry out calculations involving the four operations |
| solve problems | Using addition and subtraction in multi-step problems in contexts |
|  | deciding which operations and methods to use and why |


$104,328+61,731=166,059$


Skill: Subtract numbers with more than four digits


$$
294,382-182,501=111,881
$$



Place value counters or plain counters on a place value grid are the most effective concrete resource when subtracting numbers with more than 4 digits.

At this stage, children should be encouraged to work in the abstract, using column method to subtract larger numbers efficiently.

Skill: Subtract with up to 3 decimal places


Place value counters and plain counters on a place value grid are the most effective manipulative when subtracting decimals with 1, 2 and then 3 decimal places.

Ensure children have experience of subtracting decimals with a variety of decimal places. This includes putting this into context when subtracting money and other measures.

| TTh | Th | $\mathbf{H}$ | T | $\mathbf{O}$ |
| :--- | :--- | :--- | :--- | :--- |
|  | 2 | 7 | 3 | 9 |
| $\times$ |  |  | 2 | 8 |
| 2 | $5^{1}$ | $3^{9}$ | $7^{1}$ | 2 |
| $\mathbf{2}^{5}$ | 4 | 7 | 8 | 0 |
| 7 | 6 | 6 | 9 | 2 |

$$
2,739 \times 28=76,692
$$

When multiplying 4- digits by 2-digits, children should be confident in using the formal written method. If they are still struggling with times tables, provide multiplication grids to support when they are focusing on the use of the method.

Consider where exchanged digits are placed and make sure this is consistent.

## Skill: Divide multi-digit numbers by 2-digits (short division)



## $432 \div 12=36$

## $7,335 \div 15=489$



| 15 | 30 | 45 | 60 | 75 | 90 | 105 | 120 | 135 | 150 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

When children begin to divide up to 4 - digits by 2 digits, written methods become the most accurate as concrete and pictorial representations become less effective.

Children can write out multiples to support their calculations with larger remainders.

Children will also solve problems with remainders where the quotient can be rounded as appropriate.

Skill: Divide multi-digit numbers by 2-digits (long division)


Children can also divide by 2-digit numbers using long division.

Children can write out multiples to support their calculations with larger remainders.

Children will also solve problems with remainders where the quotient can be rounded as appropriate.

Skill: Divide multi-digit numbers by 2-digits (long division)


Number - fractions, decimals and percentages

| Focus | Progression of skills |
| :---: | :---: |
| use | common factors to simplify fractions |
|  | common multiples to express fractions in the same denomination |
| compare and order | fractions, including fractions > 1 |
| add and subtract | fractions with different denominators and mixed numbers, using the concept of equivalent fractions |
| multiply | simple pairs of proper fractions, writing the answer in its simplest form for example, $14 \times 12=18$ |
|  | one-digit numbers with up to two decimal places by whole numbers |
| divide | proper fractions by whole numbers [for example, $1 / 3 \div 2=1 / 6$ ) |
|  | using written division methods in cases where the answer has up to two decimal places |
| associate | a fraction with division and calculate decimal fraction equivalents for example, 0.375 for a simple fraction for example, $3 / 8$ |
| identify | the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10,100 and 1000 giving answers up to three decimal places |
| solve problems | which require answers to be rounded to specified degrees of accuracy |
| recall and use | equivalences between simple fractions, decimals and percentages, including in different contexts. |

## Ratio and proportion

| Focus | Progression of skills |
| :---: | :---: |
| solve problems | involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts |
|  | involving the calculation of percentages [for example, of measures, and such as $15 \%$ of 360 ] and the use of percentages for comparison |
|  | involving similar shapes where the scale factor is known or can be found |
|  | involving unequal sharing and grouping using knowledge of fractions and multiples. |
| Algebra |  |
| Focus | Progression of skills |
| use | simple formulae |
| generate and describe | linear number sequences |
| express | missing number problems algebraically |
| find | pairs of numbers that satisfy an equation with two unknowns |
| enumerate | possibilities of combinations of two variables |
|  | Measurement |
| Focus | Progression of skills |
| solve problems | involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate |
| use, read, write and convert | between standard units |
|  | converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa |
|  | using decimal notation to up to three decimal places |
| convert | between miles and kilometres |
| recognise | that shapes with the same areas can have different perimeters and vice versa |
|  | when it is possible to use formulae for area and volume of shapes |
| calculate | the area of parallelograms and triangles |
| Calculate, estimate and compare | volume of cubes and cuboids using standard units, including cubic centimetres $\left(\mathrm{cm}^{3}\right)$ and cubic metres $\left(\mathrm{m}^{3}\right)$, and extending to other units for example, $\mathrm{mm}^{3}$ and $\mathrm{km}^{3}$ |

## Geometry

| Focus | Progression of skills |
| :---: | :---: |
| draw | 2-D shapes using given dimensions and angles |
| recognise, describe and build | simple 3-D shapes, including making nets |
| compare and classify | geometric shapes based on their properties and sizes |
| find | unknown angles in any triangles, quadrilaterals, and regular polygons |
| illustrate and name | parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius |
| recognise | angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. |
| describe | positions on the full coordinate grid (all four quadrants) |
| draw and translate | simple shapes on the coordinate plane, and reflect them in the axes |
|  | Statistics |
| Focus | Progression of skills |
| interpret and construct | pie charts and line graphs and use these to solve problems |
| Calculate \& interpret | the mean as an average |


|  | Year 6 <br> *Y6 team may alter the order of what is taught in the Spring/Summer terms due to preparation for their NCTs. |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Maths areas of focus | Arithmetic Practice (Speedy Maths) *indicates new content |  |  |  | Problem solving |
| - | Number <br> Place value | +/- 2-digit numbers from hundreds at speed. Calculate x and $\div$ using tables at speed. |  | Know all tables to $12 \times 12$ including division facts at speed. |  |  |
|  |  | Convert ml to L and vice versa X and $\div$ using tables facts at speed. |  | Know pairs of numbers to 90 Add and subtract pairs of 2-digit numbers |  | $\frac{\text { Finding Fifteen }}{\text { NRICH }}$ |
|  | Number Addition, | "Know common equivalent FDP. | +/- pairs of 2-digit numbers at speed. Know pairs of numbers to 100. |  | Know all tables to $12 \times 12$ including facts at speed. Convert cm to mm and vice versa. | $\frac{\text { All Square }}{\text { MCfAP }}$ |
|  | subtraction, <br> multiplication and division | *Know square numbers to $12^{2}$ | Give change from $£ 1$ at speed. $+/-p$ from £\&p. Know common equivalent FDP. |  | Convert cm to m and vice versa. Know pairs of numbers to 90 . Know all tables to $12 \times 12$ incluaing facts at speed. | $\frac{\text { Reach } 100}{\text { NRICH }}$ |
|  | $(\mathrm{FD}$ | *Know square roots to $\sqrt{ } 144$ (ie for tables) | Know all tables to $12 \times 12$ including $\div$ facts at speed. Know square numbers to $12^{2}$ |  | Know common equivalent FDP. Know pairs of numbers to 100 and 180. | $\frac{\text { Alber Square }}{\text { Mcfap }}$ |
|  | Decima Percent | $+/$ - pairs of 2-digit numbers at speed. Convert m to km and vice versa. Know pairs of numbers to 90 . |  | Know common equivalent FDP. +/- 2 -digit and 3 -digit numbers at speed. Continue simple number patterns. |  | $\frac{\text { My Son is Naughty }}{\text { Nz Matns }}$ |
| $\begin{aligned} & \text { N } \\ & \text { है } \\ & \frac{5}{4} \end{aligned}$ |  | $\begin{array}{\|l} \text { +/- pairs of 2-digit numbers at speed. +/- p from } £ \& \text { p } \\ \text { Know square roots to } \sqrt{1} 44 \text { (ie for tables) } \end{array}$ |  | Use tables to work out related x and $\div$ at speed. Know number bonds to 1000 (tens) |  |  |
|  | Number Fractions A | Know pairs of numbers to 100 . Use tables to work out related x and $\div$ at speed. Know square numbers to $12^{2}$ Convert cm to mm and vice versa |  | Convert m to km and vice versa. +/- 2 -digit and 3 -digit numbers at speed. Continue simple number patterns. |  | $\begin{gathered} \text { Darts } \\ \text { Nz Matns } \end{gathered}$ |
|  |  | Know all tables to $12 \times 12$ including $\div$ facts at speed. Convert L to ml and vice versa. |  | Convert cm to m and vice versa. $+/-\mathrm{p}$ from $£ \& \mathrm{p}$ Know pairs of numbers to 180. |  | $\frac{\text { Bus Router }}{\text { MCfAP }}$ |
|  | Number Fractions B | Know all tables to $12 \times 12$ including $\div$ facts at speed. Convert m to km and vice versa. |  | Use tables to work out related x and $\div$ at speed. +/- pairs of 2-dig numbers at speed. Know common equivalent FDP. |  | $\frac{50 \text {. } \text { the clock }}{\text { NRich }}$ |
|  |  | +/- pairs of 2-digit numbers at speed. Know all tables to $12 \times 12$ including division facts at speed. |  | Know square numbers to $12^{2}$. Know pairs of numbers to 180. Add three tens at speed. |  | $\frac{\text { Join the Dots }}{\text { Twinkl }}$ |
|  | Measurement Converting units | Give change from $\mathrm{\Sigma} 1$ at speed. Know all tables to $12 \times 12$ including $\div$ facts at speed. Continue simple number patterns. +/- 2 -digit and 3 -digit numbers at speed. |  | Know common equivalent FDP. Know square roots to $\sqrt{144}$ (ie for tables). Use tables to work out related x and $\div$ at speed. |  | $\frac{\text { coded } 100 \text { square }}{\text { NRich }}$ |
| $\begin{aligned} & \text { \# } \\ & \text { og } \\ & \text { 듬 } \end{aligned}$ | Number Ratio | Know pairs of numbers to 90 . Know common equivalent FDP. |  | Convert L to ml and vice versa. Know number bonds to 1000 (tens). Convert cm to m and vice versa |  |  |
|  |  | +/- pairs of 2-dig numbers at speed. Use tables to work out related x and $\div$ at speed. Convert cm to mm and vice versa |  | Convert m to km and vice versa. Add three tens at speed. +/-2-digit and 3 -dig numbers at speed. +/- p from $£ \&$. |  | $\frac{\text { Sticky Trianaler }}{\text { NRICH }}$ |
|  | Number Algebra | Know all tables to $12 \times 12$ including $\div$ facts at speed. Know square numbers and square roots to $12^{2}$ |  | Know common equivalent FDP. Know pairs of numbers to 180. |  | $\frac{\text { Iaples without Tens }}{\text { NRICH }}$ |
|  |  | +/- pairs of 2-digit numbers at speed. Know pairs of numbers to 100 . Convert m to km and vice versa. |  | Know all tables to $12 \times 12$ including $\div$ facts at speed. Use tables to work out related x and $\div$ at speed. |  | $\xrightarrow[\mathrm{NROLCS}]{ }$ |
|  | Number Decimals | +/- pairs of 2-digit numbers at speed. Use tables to work out related x and $\div$ at speed. |  | +/- 2-digit and 3 -digit numbers at speed. Continue simple number patterns. Convert m to km and vice versa. |  | $\frac{\text { The Candle Problem }}{\text { PNS }}$ |
|  |  | Know pairs of numbers to 100 . <br> Know all tables to $12 \times 12$ including division facts at speed. |  | Know pairs of numbers to 180. <br> Know square numbers and square roots to $12^{2}$ |  | $\frac{\text { Xavi's T-Shitr }}{\text { NRICH }}$ |
| $\begin{aligned} & \text { * } \\ & \text { o } \\ & \text { 듬 } \end{aligned}$ | Number Fractions, decimals and percentages | Know pairs of numbers to 90 . Know common equivalent FDP. +/- p from £\&p. |  | Know number bonds to 1000 (tens). +/- 2-digit and 3-digit numbers at speed. Convert cm to mm and vice versa |  | Froblem saving sratoges Lesion |
|  |  | Add and subtract pairs of 2 -digit numbers at speed. Use tables to work out related x and $\div$ at speed. |  | Give change from $£ 1$ at speed Convert I to ml and vice versa |  |  |
|  | Measurement Area, perimeter and volume | +/- pairs of 2 -digit numbers at speed. know square numbers and square roots to $12^{2}$ continue simple number patterns. |  | Know all tables to $12 \times 12$ including $\div$ facts at speed. +/- 2 digit and 3 -digit numbers at speed. |  |  |
|  |  | Use tables to work out related x and $\div$ at speed. Know all tables to $12 \times 12$ including :facts at speed. |  | Know common equivalent FDP. <br> +/- pairs of 2-digit numbers at speed. |  |  |
|  | Statistics | Add and subtract pairs of 2 -digit numbers at speed. Know all tables to $12 \times 12$ including division facts at speed. |  | Know pairs of numbers to 180. Convert cm to m and vice versa |  |  |
|  |  | Know common equiva Use tables to work out | ient FDP. <br> related x and $\div$ at speed. | $\begin{aligned} & +/-2-0 \\ & \text { numb } \end{aligned}$ | git and 3 -digit numbers at speed. Continue simple patterns. +/- pairs of 2-digit numbers at speed. |  |
| $\begin{aligned} & \stackrel{*}{6} \\ & \frac{1}{6} \\ & \text { E } \end{aligned}$ | Geometry Shape | Know pairs of numbers to 100 . Know common equivalent FDP. |  | Convert m to km and vice versa Use tables to work out related x and $\div$ at speed. |  | $\underset{\substack{\text { Probiem Solving Shatogies } \\ \text { Lesson }}}{ }$ |
|  |  | +/- pairs of 2-digit numbers at speed. Use tables to work out related x and $\div$ at speed. Know pairs of numbers to 90 |  | Know square numbers and square roots to $12^{2}$ Convert m to km and vice versa |  |  |
|  |  | Know common equivalent FDP. Continue simple number patterns. |  | $+/-2$-digit and 3 -digit numbers at speed. <br> Know all tables to $12 \times 12$ including $\div$ facts at speed. |  |  |
|  | Geometry Position and direction | Add and subtract pairs of 2-digit numbers at speed. Know square numbers and square roots to $12^{2}$. |  | Add and subtract 2-digit and 3-digit numbers at speed. Continue simple number patterns. |  |  |
|  | Themed projects, consolidation and problem solving. | Know pairs of numbers to 100 and 180 |  | Know all tables to 12×12 including division facts at speed. |  |  |
|  |  | Know square numbers and square roots to $12^{2}$ |  | Convert m to km and vice versa |  |  |
| $\begin{aligned} & \text { ※ } \\ & \text { あ } \\ & \text { E } \\ & \text { E } \end{aligned}$ |  | Add and subtract pairs of 2-digit numbers at speed. |  | Continue simple number patterns |  | $\underset{\substack{\text { Probiem Solving Sratoges } \\ \text { lesson }}}{ }$ |
|  |  | Know pairs of numbers to 90 . Know common equivalent FDP. |  | Add and subtract 2-digit and 3-digit numbers at speed. |  |  |
|  |  | Add and subtract pairs of 2-digit numbers at speed. Know all tables to $12 \times 12$ including division facts at speed. |  | Know pairs of numbers to 180. |  |  |
|  |  | Know pairs of numbers to 100. |  | Convert L to ml and vice versa |  |  |
|  |  | Add and subtract pairs of 2-digit numbers at speed. |  | Continue simple number patterns |  |  |
|  |  | Know all tables to $12 \times 12$ including division facts at speed. |  | Continue simple number patterns |  |  |

Problem solving - whole school overview

|  | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Year 1 |  |  |  |  | U | $\stackrel{\cup}{\oplus}$ |
| Year 2 |  |  |  |  |  |  |
| Year 3 |  |  |  |  |  |  |
| Year 4 |  |  |  |  |  |  |
| Year 5 |  |  |  |  |  |  |

## Progression in reasoning skills

## Describing

I can describe what I did.

## Explaining

I can offer some reasons for what I did.
Convincing
I am confident that my reasoning is correct (*even if it's not!) and I can try to convince you that I'm right. Justifying
I can use words like 'therefore', 'that means that', 'that leads to' to justify a correct logical argument with a complete chain of reasoning.

## Proving

I can make a watertight argument that is mathematically sound.

