Mathematics at Richmond Hill Primary Academy

Below are the Key Strands that Richmond Hill's whole curriculum is designed around. Our Maths curriculum supports children to develop Strands 1, 2 3 and 4 through language rich, high challenge and pedagogical strategies deployed throughout Maths lessons.

Strand 1- Developing Resilient & Aspirational Learners	Strand 2 – Developing Self-Regulated Learners	Strand 3 – Developing an Understanding of Equality, Diversity and Creating Culturally Rich Learners	Strand 4 – Developing Risk Assured Learners	Strand 5 – Developing Environmental and Sustainability Aware Learners

At Richmond Hill Primary, we follow the *Mathematics Mastery* approach to ensure all pupils develop a deep, secure understanding of mathematics. Our curriculum is designed to build declarative, procedural, and conditional knowledge systematically, aligning with the programme's focus on fluency, reasoning, and problem-solving.

How Our Maths Curriculum Has Been Designed

The Mathematics Mastery Curriculum has been designed around 4 core principles:

1. Knowledge-rich
2. Academically ambitious
3. Logically sequenced
4. Designed to support memory

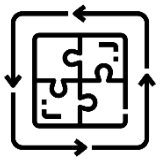
1. Knowledge-rich

A rich and broad body of core knowledge is clearly and meticulously specified. Knowledge is selected for its power in developing expertise in the subject discipline.[1] Therefore, it is knowledge possessing sufficient significance, status, or influence in the subject discipline to support the claim that it is 'the best that has been thought and said'.[2] This powerful knowledge helps induct students into the great conversations of humankind, that they may understand, challenge and further those conversations.[3] It empowers students to achieve in school and to live fulfilling lives, able to understand, appreciate, critique and, if they desire, change the world in which they live.[4] The specific knowledge students should remember is precisely defined.

Skills are understood to be domain-specific and their development is intrinsically linked with acquisition of knowledge. For example, for students to analyse, solve problems or think critically in a subject, they need a rich knowledge of the area of the subject they are required to analyse, solve problems in, or think critically about.[5]

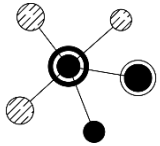
2. Academically ambitious

The curriculum provides students with knowledge that they are unlikely to otherwise encounter or understand without a teacher's support.[6] The content selected is ambitious in order to challenge the most able and provide a rich and empowering education to all. The extent of knowledge provides a broad and deep grounding in subjects, so that students have a framework within which they can situate future learning, regardless of whether they continue a subject beyond Key Stage 3. The curriculum is not narrowed by selecting knowledge solely for its utility in preparing students for later exam success.[7]

3. Logically sequenced 

Knowledge is 'generative' or 'sticky'. It attaches to pre-existing knowledge, creating connections in long-term memory and forms increasingly complex mental models (or 'schemata').[8] In other words, 'students learn new ideas by reference to ideas they already know.'[9] Therefore, within units and across the whole curriculum, knowledge is positioned to build on what has come before. The curriculum sets out a logical journey that students need to embark on to get better at a subject. In this sense, 'the curriculum is the progression model';[10] it is the selection and organisation of knowledge to form a coherent model of intended progression in the subject.

As students progress through the curriculum, they grapple with greater complexity and develop both increasing conceptual understanding and disciplinary competency. This does not mean the curriculum always starts with the 'easiest' knowledge, but with the most foundational or facilitating knowledge.[11] The sequencing of content also aims to pre-empt and avoid common misconceptions.

4. Designed to support memory 

Learning is a change in long-term memory.[12] The curriculum is structured to help students remember, not simply encounter, the core knowledge they learn. 'Memory is the residue of thought',[13] therefore, tasks are designed to ensure that students are thinking about subject matter. In order to disrupt the forgetting curve, knowledge from previous units is interleaved in future units and revisited through frequent low- stakes retrieval practice.[14] The points at which students apply knowledge from existing and previous units are explicitly stated.

1 Young, M., Lambert, D. (2014) *Knowledge and the Future School*. Bloomsbury, London.

2 Arnold, M. (1869) *Culture and anarchy: An essay in political and social criticism*. Smith, Elder & Co., London., p.70.

3 Oakeshott, Michael. (1962) 'The Voice of Poetry in the Conversation of Mankind' in *Rationalism in Politics and Other Essays*. London., pp. 197-247.

[4] E. D. Hirsch, E. D. (1987) *Cultural Literacy: What Every American Needs to Know*. Houghton Mifflin. USA.

[5] Christodoulou, D. (2014) *Seven Myths About Education*. London: Routledge.

[6] Young, M., Lambert, D. (2014). *Knowledge and the Future School*. Bloomsbury, London.

[7] Spielman, A., (2019) 'Amanda Spielman at the 'Wonder Years' curriculum conference' (speech). Retrieved from: https://www.gov.uk/government/speeches/amanda-spielman-at-the-wonder-years-curriculum-conference

[8] Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000) *How People Learn: Brain, Mind, Experience, and School.* National Academy Press. USA.

[9] Deans for Impact (2015) 'The Science of Learning' [Online]. Retrieved from: https://deansforimpact.org/wp- content/uploads/2016/12/The_Science_of_Learning.pdf

[10] Fordham, M., (2020) 'What did I mean by the curriculum is the progression model'? *Clio et cetera* [blog]. Retrieved from: https://clioetcetera.com/2020/02/08/what-did-i-mean-by-the-curriculum-is-the-progression- model/

[11] Willingham, D. T. (2008). 'What is Developmentally Appropriate Practice?' in American Educator., pp. 34- 39.

[12] Kirschner, P.A. Sweller, J. Clark, E. R. (2006). 'Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching'. *Educational Psychologist*. 41(2)., pp. 77.

[13] Willingham, D. T. (2010). *Why Don't Students Like School?: A Cognitive Scientist Answers Questions About How the Mind Works and What It Means for the Classroom*. Jossey-Bass (Wiley). USA.

[14] Agarwal, P. K., Bain, P. M., & Chamberlain, R. W. (2012). 'The value of applied research: Retrieval practice improves classroom learning and recommendations from a teacher, a principal, and a scientist'. Educational Psychology Review. 24(3)., pp. 437-448.

Knowledge

Building Foundational Knowledge

Developing children's mathematical fluency is vitally important, especially in the Early Years. At Richmond Hill, children are given regular opportunities to build their foundational number sense through hands-on, exploratory learning and structured, systematic teaching. In line with the Mathematics Mastery programme, children experience number through practical activities, visual representations, and purposeful talk, ensuring that key mathematical concepts are deeply embedded. In EYFS, we prioritise the development of number sense, pattern recognition, and spatial awareness. This includes subitising, understanding the cardinality of numbers, comparing quantities, and recognising patterns in number and shape. These early concepts are critical, as they underpin all future mathematical learning. Just as a child must learn how to hold a pencil before they can write fluently, they must develop confidence with numbers and early operations before they can solve more complex problems. Fluency in early mathematics is built through repetition, retrieval and varied practice. At Richmond Hill, we know that 'practice makes permanence' and we apply this to our teaching of foundational mathematical knowledge. Children revisit concepts frequently through Maths Meetings, adult-led small group sessions, and continuous

provision opportunities that are carefully planned to embed number fluency and conceptual understanding. Children are taught to use mathematical vocabulary confidently and are encouraged to talk about their thinking using full sentences. This oral rehearsal supports cognitive development and helps children to internalise mathematical structures and patterns. Only once children have developed strong fluency with early number, shape, and measures do they move on to more complex reasoning and problem-solving tasks.

At Richmond Hill, we believe that building a secure foundation in mathematics is essential for every child to become a confident and capable mathematician. Through high-quality teaching, meaningful practice, and a carefully structured curriculum, we ensure our children are equipped with the knowledge and fluency they need to succeed as they move through school.

Developing Declarative Knowledge Through Depth

In line with *Mathematics Mastery's* emphasis on depth before acceleration, we prioritise secure understanding of key mathematical facts and concepts. Pupils develop fluency in number bonds, times tables, and mathematical properties through carefully structured lessons, ensuring they can recall and apply these facts with confidence. Lessons are structured to ensure that activities provide regular opportunities to revisit and consolidate this knowledge.

Mathematics Mastery uses the three key principles to deepen pupils' understanding. Pupils' conceptual understanding is developed through the use of multiple concrete and pictorial representations. Indeed, a key part of a 'deep understanding' in maths is being able to represent ideas in lots of different ways. Pupils use different concrete objects and pictures to represent abstract concepts. This helps pupils to make connections between representations, identifying what aspects are the same and which are different.

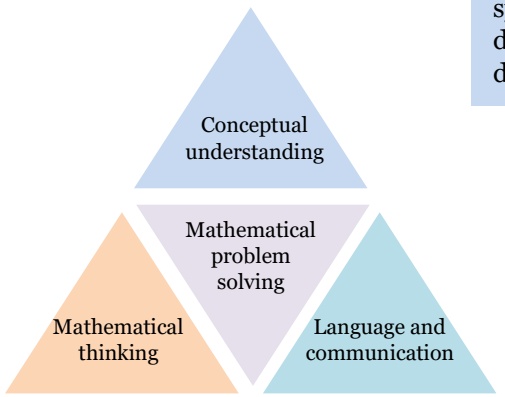
Depth of understanding is also developed through pupils' communication about maths using the correct mathematical language. Being asked to explain, justify and prove their ideas deepens a pupil's understanding of a concept.

Conceptual understanding

Pupils deepen their understanding by representing concepts using objects and pictures and, more abstractly, with words and symbols. They make connections between different representations and consider what different representations stress and ignore.

Mathematical thinking

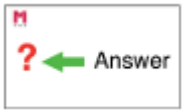
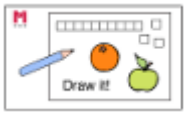
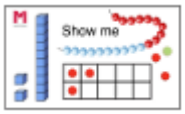
Pupils deepen their understanding by giving an example, by sorting or comparing, or by looking for patterns and rules in the representations they are exploring problems with.



Language and communication

Pupils deepen their understanding by explaining, creating problems, justifying and proving using mathematical language. This acts as a scaffold for their thinking and deepening their understanding further.

Another way to develop a depth of understanding is to encourage pupils to think mathematically. We do this by providing lots of opportunities for pupils to investigate carefully planned open questions that get them to sort and compare, seek patterns and look for rules. Pupils also need to develop as active mathematicians; the curriculum provides opportunities for them to ask questions and create their own problems to explore. This aims to develop deep understanding but also fosters curiosity and creativity in mathematics. We utilise ten ideas that challenge pupils to develop a depth of understanding within a concept, rather than moving them on to a new objective. Each of the ten ideas is represented by a picture or symbol. The idea being that, after introduction, the tasks can be easily identified by pupils without the need for instruction. These 10 tasks are set out below.

Icon	Prompt	Description
	What's the question?	If this is the answer, what could the question have been? This could be an equation or a word problem.
	What's wrong with this?	Can you explain what is wrong with this and correct the error?
	Draw it	Draw a picture to explain or demonstrate what you have worked out.
	Reason it	Explain to your partner how you know. Remember to use the star words!
	Show me!	Convince me that you are right.
	Find a pattern	Can you see a pattern (in the numbers)? Can you see a pattern in the answers? Continuing this pattern, what would happen if...? What came before? What comes next? Explain how you know.
	What's the same? What's different?	Can you find anything that is the same about these two numbers/shapes/calculations? Now can you find something that is different?

Icon	Prompt	Description
	Maths story	Make up a real-life story using your equation/numbers or shapes. Try to use the star words.
	Have you found all possibilities?	Is there more than one way of completing this? Is there more than one answer? Have you found them all?
	Odd one out	Find an odd one out and explain why it doesn't fit. Does your partner agree with you? Could another one be the odd one out? Why?

Ensuring Procedural Fluency Using the CPA Approach

We develop procedural fluency through the *Concrete-Pictorial-Abstract (CPA)* approach. Pupils first explore new concepts using manipulatives (e.g. counters, base ten blocks), then transition to pictorial representations (e.g. bar models, number lines) before moving to abstract methods (e.g. written calculations). This approach supports deep understanding and helps pupils make connections between different mathematical ideas. Our structured lessons ensure that pupils have plenty of opportunities to practise and internalise efficient and accurate methods.

Within the CPA approach, Mathematics Mastery sets out key representations for Year 1 to 6 as set out below.

Year 1 Key Representations

Find out more...

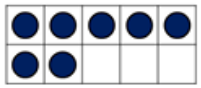
Watch the **Unit tutorial** before planning each unit.

Read the **planning guides** for suggestions of representations.

Make use of **PD videos** on unit pages and Progression in Calculations page.

Representations of number

Pupils are most familiar with concrete representations of number within 20 which show one to one correspondence, such as cubes, counters, bead strings to 20 and other countable objects. They also recognise numerals and numbers to 20. A ten frame has been used to represent numbers and think about what this shows.

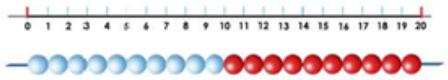


There are seven counters.
Seven is two more than five.
Seven is three less than 10.

There are 11 cubes. 11 is one more than ten.

Ordering numbers

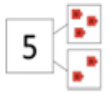
Pupils have explored a number of ways to order and compare numbers practically using representations including a **number track** and a **number line**, within 20. These representations are used to secure counting within 20 and stating one more / one less.



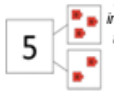
Part-whole language and representations

Pupils will have had lots of experience partitioning numbers in different ways through exploring concrete representations. They may identify these as parts and should see that numbers can be split in different ways.

A part-whole model is used to represent number bonds, addition and subtraction. Pupils are familiar with the concept of a whole and partitioning this into two or more parts. They explore how to write this relationship as an equation.



The whole is five. I can partition five into one part of three and one part of two.



There are three people in one train carriage and two people in another. One part is three and one part is two. The whole is five.

whole = part + part
5 = 3 + 2

Equations

The phrase 'is equal to' is used consistently to refer to the = symbol. What is on one side of the symbol is equal to what is on the other side. Present equations in different ways to support this:

2 + 3 = 5
5 = 3 + 2

Comparing numbers

Concrete representations are used to compare numbers, focusing on correct language use. The structure of the representation supports comparison: lining towers of cubes next to one another builds on one-to-one correspondence.

*Five is **less than** seven. Five ones is **fewer** than seven ones.*
*Seven is **greater than** five.*

Representing numbers 11-20

Pupils say, read and write teen numbers. Pupils understand the ten and ones relationship of teen numbers, supported by representations.

There are fourteen cubes. This is written as 14. 14 is one ten and four ones.

Counting principles – conservation of number

A key number principle for developing addition and subtraction strategies is to understand that the same number of objects will always have the same value.

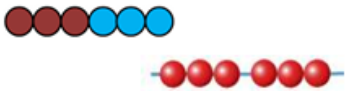
There are still seven counters. The position has changed but no counters have been added or taken away.

Counting principles – subitising

Subitising is the ability to identify a group of objects without the need to count. Pupils have explored this and should be confident in subitising up to five objects. Making use of patterns e.g. die faces, triangle shapes can support this.

Doubling and halving

Pupils have had opportunities to represent doubling and halving within 20 practically using manipulatives and other countable objects. Some facts may be recalled and pupils may connect this with equal groups.



Double three is six. Three plus three is equal to six. Half of six is three.

Development of division

Pupils explore counting in equal groups using manipulatives or pictorial representations.

There are three equal groups of 10. 10, 20, 30. There are 30 altogether.

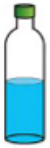
Pupils have explored the concept of equal and unequal grouping and sharing in context using concrete manipulatives.

15 cows can be grouped into five fields in this way. The groups are unequal.

If 15 bags of grain are shared equally between five farmers, each farmer gets three bags.

Developing fraction language

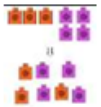
The foundations for fractions have been laid through exploration of half full / half empty and associated descriptions. Pupils have also explored doubling and halving without linking specifically to fractions.



The bottle is half full.
The bottle is half empty.

Addition and subtraction strategies

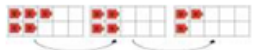
Pupils are familiar with addition and subtraction (taking away) using concrete and pictorial representations. A range of contexts for this have been explored. Pupils should be familiar with strategies including count all, count on and count back using representations.



I have three red cubes and four purple cubes. I can put them together and count the whole. There are seven cubes.

I have four yellow cubes. I add two green cubes. I can count on from four: five, six. There are six cubes.

I have five cubes. I can take away two: four, three. Five take away two is three.



Year 2 Key Representations

Find out more…

Watch the **Unit tutorial** before planning each unit.

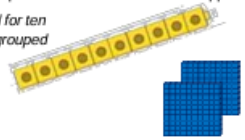
Read the **planning guides** for suggestions of representations.

Make use of **PD videos** on unit pages and Progression in Calculations page.

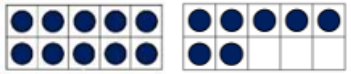
Representations of number

Pupils have primarily used counters, cubes and other discrete objects to represent number. Cubes have been used to support the process of **regrouping** – one ten is equal to ten ones. A ten frame supports this alongside number bonds for 10. Both are used to represent teen numbers.

One ten is regrouped for ten ones. Ten ones is regrouped for one ten.



17 is one ten and seven ones.



Pupils have also encountered Dienes equipment to represent larger integers to 100. Counting in tens to identify these numbers has also been developed.

Number lines

Number lines can be used to represent and compare numbers and can be used alongside a bead string. They demonstrate the continuous nature of the number system. Pupils have ordered numbers on a number line.

Equations

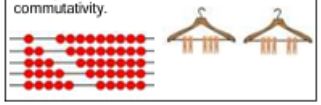
The phrase 'is equal to' is used consistently to refer to the = symbol. What is on one side of the symbol is equal to what is on the other side. Present equations in different ways to support this:

$7 = 3 + 4$

$3 + \square = 7$

Number bond knowledge

Pupils should be increasingly fluent in number bond recall for all numbers to 10 and use representations to consider commutativity.



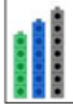
Deriving facts

Pupils use known facts such as number bonds and understanding of place value and magnitude to derive further facts. Commutativity for addition is also used.

If I know 3 + 4 = 7 then I know 13 + 4 = 17
If I know 3 + 4 = 7 then I know 4 + 3 = 7

Comparing numbers

Pupils have experienced a range of language to compare numbers.

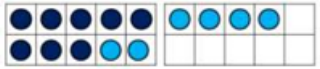


Five is less than seven. Five ones is fewer than seven ones. Seven is greater than five. Six is between five and seven. It is after five and before seven.

The 'make 10' strategy

Pupils apply number bonds to 10 to calculate how many more/less to the next multiple of ten. They partition the part into two parts to calculate mentally. Using concrete or pictorial representations can scaffold thinking.

$8 + 6 = ?$ *I know eight and two make 10 so I can partition six into two and four.*

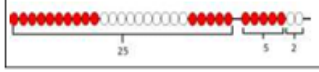


Ten more / ten less

Pupils have explored ten more and ten less than numbers within 50 using manipulatives. They also skip count on and back in tens from different starting points. Mental recall of this can be developed in Maths Meetings.

Finding the difference

Pupils recognise that in a subtraction calculation where the numbers are close together in value, a count on strategy can be used to find the difference.

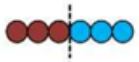


$32 - 25 = ?$ *I can count on from 25 to find the difference. Five more is 30, two more is 32. The difference is seven.*

Representing fractions

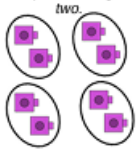
Pupils identify half and quarter of a shape and a quantity within 20 using practical experiences including equal sharing for a quantity. They are also familiar with half turns, linking this to half past on a clock face.

One half is one of two equal parts.
One quarter is one of four equal parts.



Half of six is three.

One quarter of eight is two.



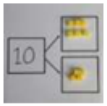
Doubling and halving

Pupils have had opportunities to represent doubling and halving within 20 using concrete and pictorial representations. This is connected to their understanding of half. Some facts will be recalled.

Double three is six. Three plus three is equal to six. Half of six is three. Six take away three is equal to three.

Part-whole language and representations

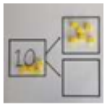
A part-whole model is used to represent the relationship between numbers and will have been used for addition and subtraction. The model is made of a **whole** and two or more **parts**.



The whole is ten. One part is six and one part is four. Six plus four is equal to ten.

whole = part + part
10 = 6 + 4

By moving the manipulatives the model represents subtraction. Care should be taken to ensure connections between the movement of the manipulatives: *I subtract one part of six. I am taking away one part of six.*



The whole is ten. I subtract one part of six. The missing part is four. Ten subtract six is equal to four.

whole – part = part
10 – 6 = 4

Division by sharing / grouping

Pupils have been exposed to the concept of division within 20 through equal grouping and equal sharing. They have also explored unequal grouping and sharing. Pupils should explore the terms grouping and sharing and be familiar with both.

20 shared into five equal groups gives four in each group.

20 grouped into groups of five gives four groups.

Year 3 Key Representations

Find out more…

Watch the **Unit tutorial** before planning each unit and read the **Unit Narrative.**

Read the **planning guides** for suggestions of representations.

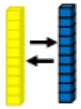
Make use of **PD videos** on unit pages and Progression in Calculations page.

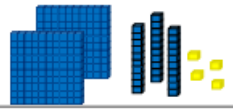
Explore the guidance for Year 3 representations.

Dienes equipment

An important resource for demonstrating the relative size of place value columns. Supports the process of **regrouping –** one ten is equal to ten ones, one hundred is equal to ten tens and so on. Can also be used to represent addition and subtraction with 2- and 3-digit integers.

One ten is regrouped for ten ones. Ten ones is regrouped for one ten.

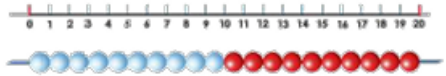


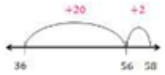


234 is two hundreds, three tens and four ones. I can represent subtracting 20 by removing two ten sticks.

Number lines

Number lines can be used to represent and compare numbers and can be used alongside a bead string. They demonstrate the continuous nature of the number system. When calculating, number lines may act as a jotting of the steps of a mental calculation and may begin 'empty' i.e. not have numbered divisions. Pupils will have experienced this most through adding tens then ones as shown. The use of number lines is extended during Year 3.





Equations

The phrase **'is equal to'** is used consistently to refer to the = symbol. Equations should be presented with symbols and missing numbers in different positions:

$38 = 25 + 13$

$\square = 37 + 44$

$12 \div \square = 4$

Number bond knowledge

Pupils should be increasingly fluent in number bond recall for all numbers to 20. Make use of transitions and Maths Meetings to develop this.

$17 = 12 + 5$

$17 = 11 + 6$

$17 = 10 + 7$

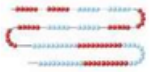
Deriving facts

Pupils use known facts such as number bonds and understanding of place value and magnitude to derive further facts.

If I know $12 + 5 = 17$ *then* $22 + 5 = 27$.
If I know $12 + 5 = 17$ *then* $17 - 12 = 5$
If I know $17 - 12 = 5$ *then* $37 - 12 = 25$

Bead strings

Bead strings help support the ordinality of number. They are repurposed e.g. beads have the value 101-200 for representation when rounding.



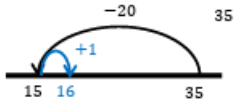
The 'make 10' strategy

Pupils apply number bonds to 10 to calculate how many more/less to the next multiple of ten. They partition the part into two parts to calculate mentally. Using concrete or pictorial representations can scaffold thinking.

$36 + 27 = ?$ *I can partition 27 into 4 and 23. 36 plus 4 is equal to 40. 40 plus 23 is equal to 63.*

Round and adjust

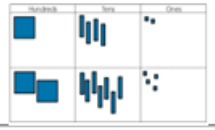
Pupils apply understanding of ordinality of number, recognising when a part or whole is close to a multiple of 10 e.g. 29, 32. They round before calculating, then adjust their answer accordingly. Concrete or pictorial models are used to represent this.



$35 - 19 = 16$

Place value charts

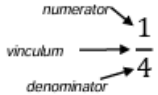
Place value charts have been used to represent two-digit numbers and can be used alongside concrete, pictorial and abstract representations of number to secure understanding of the positional aspect of the number system. Pupils have made use of place value charts when adding two 2-digit numbers and their use is extended in Year 3.



Representing fractions

A range of concrete and pictorial representations are used for fractions including fractions of a whole, as part of a set of objects and as part of a quantity such as a length or volume. Pupils should be familiar with a range of representations.

One of four equal parts.

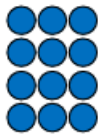


One quarter of 12 is three.

One quarter of a metre is 25 cm.

Arrays

Concrete and pictorial arrays demonstrate the **commutativity** of multiplication and **inverse relationship** of multiplication and division. Pupils should be familiar with considering rows and columns. **Part-whole language** may be used alongside.

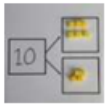


There are four parts/groups each with a value of three. The whole is 12. Four multiplied by three is equal to 12.

The whole is 12. There are three parts/groups each with a value of 4. 12 divided by three is equal to four. One third of 12 is equal to four.

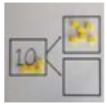
Part-whole language and representations

A part-whole model is used to represent the relationship between numbers in all four operations. The model is made of a **whole** and two or more **parts**.



The whole is ten. One part is six and one part is four. Six plus four is equal to ten.

By moving the manipulatives the model represents subtraction.



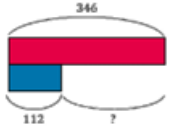
The whole is ten. I subtract one part of six. The missing part is four. Ten subtract six is equal to four.

Multiplication, division and fractions of quantities can be represented using multiple equal parts.

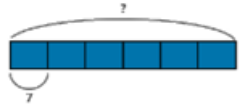
There are three equal parts with a value of four. The whole is 12. Three multiplied by four is equal to 12.
12 divided into three equal parts is equal to four.
One third of 12 is four.

Bar models

Pictorial bar models and concrete Cuisenaire as bar models are used throughout the year and represent **part-whole relationships** and **knowns and unknowns** within problems. See PD videos for further exemplification.



I know the whole is 346, and one of the parts is 112. I do not know the value of the missing part. I can subtract 112 from 346.



The value of each part is 7 and there are 6 equal parts. The whole is unknown.

$7 \times 6 = 42$

Year 4 Key Representations

Find out more...

Watch the **Unit tutorial** before planning each unit and read the **Unit Narrative.**

Read the **planning guides** for suggestions of representations.

Make use of **PD videos** on unit pages and Progression in Calculations page.

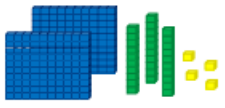
Equations

The phrase **'is equal to'** is used consistently to refer to the = symbol. Equations should be presented with symbols and missing numbers in different positions:

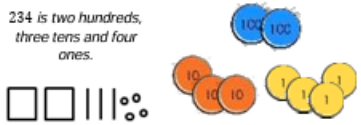
$38 = 25 + 13$
$\square = 37 + 44$
$12 \div \triangle = 4$

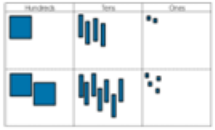
Representations of number

Pupils are familiar with a range of concrete and pictorial representations of number with and without a place value chart. These are used to represent a number or calculation and should not be used as a counting tool. Pupils also make use of these when comparing numbers.



234 is two hundreds, three tens and four ones.





Number lines

Number lines can be used to represent and compare, demonstrating the continuous nature of the number system. When calculating, number lines may act as a jotting of the steps of a mental calculation and may begin 'empty' i.e. not have numbered divisions. They are also used as a representation for rounding.

Number fact knowledge

Pupils know number bonds to 100 and apply to other multiples of 10. Pupils are increasingly fluent in a range of number facts including partitioning in different ways to discuss number.

136 is multiple of 4 because I can see 120 and 16 which are both multiples of 4.

They are also familiar with multiplication tables for 2, 3, 4, 5, 6, 8 and 10 and related division facts.

$6 \times 8 = 48 \quad 48 \div 8 = 6$

Make use of transitions and Maths Meetings to develop this.

Deriving facts and inverse relationships

Pupils use known facts such as number bonds and understanding of place value and magnitude to derive further facts.

If I know $12 + 5 = 17$ *then* $222 + 5 = 227$
If I know $3 \times 4 = 12$ *then I know* $6 \times 4 = 24$

Inverse relationships have also been explored.

If I know $12 + 5 = 17$ *then* $17 - 12 = 5$
If I know $3 \times 4 = 12$ *then I know* $12 \div 4 = 3$

Multiplication and division by powers of 10

Pupils have experienced the concept of ten times greater and smaller through exchanging Dienes, linking this to the apparent move of digits in a place value chart.

30 is ten times greater than 3.

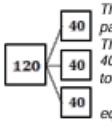
Part-whole language and representations

A part-whole model is used to represent the relationship between numbers in all four operations. The model is made of a **whole** and two or more **parts**.

We know the whole is 312 and the value of one part is 190. We can use subtraction to find the missing part.

There are three parts.
$90 + 150 + 72 = 312$

Using multiple **equal** parts represents multiplicative relationships.



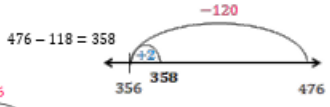
There are three equal parts with a value of 40. The whole is 120. 40 multiplied by 3 is equal to 120.
120 divided into three equal parts is equal to 40.

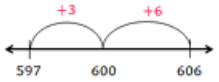
Mental strategies

Pupils have experienced a range of mental strategies for all four operations, including:

- Applying number bonds to 10 and 100 to calculate how many more/less to the next multiple of ten, extending to 100 and 1000, using the 'make 10' strategy.
- Identifying numbers close to a multiple of ten or 100 e.g. 28, 201 and using a round and adjust strategy, including for multiplication. *"If I know 20 x 4 is 80, then 19 x 4 is 76".*
- Identifying near doubles for addition. *43 and 45 can be seen as 'double 43 plus two.'*
- Subtracting numbers close together in value, through counting on to find the difference.

$336 + 127 = ?$ *I can partition 27 into 123 and 4. 336 plus 4 is equal to 340. 340 plus 123 is equal to 463.*



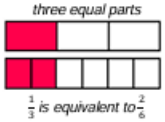


$606 - 597 = ?$ *I can count on from 597 to 606. The difference is 9.*

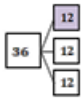
Representing fractions

A range of concrete and pictorial representations have been used for fractions including fractions of a whole, as part of a set of objects and as part of a quantity such as a length or volume. Pupils can apply these representations to comparing, finding simple equivalence and adding and subtracting with the same denominator, as well as fractions of sets or quantities.

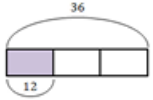
One third is one of three equal parts

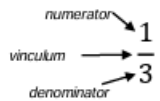


$\frac{1}{3}$ *is equivalent to* $\frac{2}{6}$



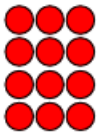
One third of 36 is 12.





Representing multiplicative relationships

Pupils have represented multiplicative relationships concretely and pictorially, primarily through arrays, Cuisenaire and bar models. A focus on equal parts, the number of equal parts and the value of each part supports understanding of commutativity and inverse relationships. The representations and language structures support written strategies.

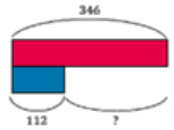


There are four groups each with a value of 3.
There are three groups each with a value of 4.
I can see three, four times.
I can see four, three times.

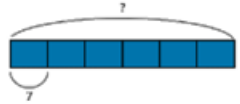
12 divided into groups of 4 gives three groups
12 shared into four groups gives 3 in each group

Bar models

Pictorial bar models and concrete Cuisenaire as bar models are used to represent **part-whole relationships** and **knowns and unknowns** within problems in all four operations. See PD videos for further exemplification.



I know the whole is 346, and one of the parts is 112. I do not know the value of the missing part. I can subtract 112 from 346.



The value of each part is seven and there are six equal parts. The whole is unknown. Six groups of seven is equal to 42. The whole is 42.

Upper KS2 Key Representations

Find out more...

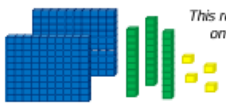
Watch the **Unit tutorial** before planning each unit and read the **Unit Narrative.**

Read the **planning guides** for suggestions of representations.

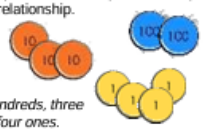
Make use of **PD videos** on unit pages and Progression in Calculations page.

Representations of number

Pupils are familiar with a range of concrete and pictorial representations of number with and without a place value chart. These are used to represent a number or calculation and should not be used as a counting tool. Pupils have also experienced representing decimal numbers using manipulatives including repurposing Dienes equipment, understanding the base 10 relationship.



This represents 2.34. It is 2 ones, 3 tenths and 4 hundredths.

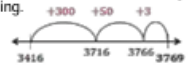


234 is two hundreds, three tens and four ones.

	2	3	4	

Number lines

Number lines can be used to represent and compare, demonstrating the continuous nature of the number system. When calculating, number lines may act as a jotting of the steps of a mental calculation and may begin 'empty' i.e. not have numbered divisions. They are also used as a representation for rounding.



Number fact knowledge

Pupils have an increasing range of number facts. Pupils should know all multiplication tables and related division facts.

Pupils make increasing use of number facts when considering larger integers.

I know 132 is a multiple of 4 because I can partition it into 120 and 12. These are both multiples of 4.

Part-whole language and representations

A part-whole model is used to represent the relationship between numbers in all four operations. The model is made of a **whole** and two or more **parts**.

The whole is ten. One part is six and one part is four. Six plus four is equal to ten.

Using multiple equal parts represents multiplication, division and fractions of quantities.

There are three equal parts with a value of four. The whole is 12. Three multiplied by four is equal to 12.
12 divided into three equal parts is equal to four.
One third of 12 is four.

Close links are made between this and bar model representations.

Equations

The phrase **'is equal to'** is used consistently to refer to the = symbol. Equations should be presented with symbols and missing numbers in different positions:

38=25+ 13
□ =37+44
12 ÷ □ =4

Deriving facts

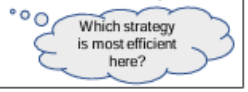
Using known number bonds pupils derive more complex facts including deriving decimal bonds and facts.

I know 1 + 3 = 4 *so* 0.1 + 0.3 = 0.4
I know 13 + 12 = 25 *so* 1300 + 1200 = 2500

Using strategies

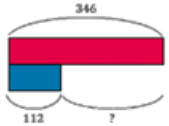
Pupils are familiar with columnar addition and subtraction, short multiplication and short division written strategies and have developed conceptual understanding through concrete and pictorial representations. These strategies can be applied to larger integers and decimals. See PD videos for further exemplification.

Pupils should make use of a range of strategies, considering efficiency.

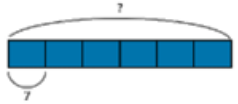


Bar models

Pictorial bar models and concrete Cuisenaire as bar models are used to represent **part-whole relationships** and **knowns and unknowns** within problems in all four operations. See PD videos for further exemplification.



I know the whole is 346, and one of the parts is 112. I do not know the value of the missing part. I can subtract 112 from 346.



The value of each part is seven and there are six equal parts. The whole is unknown. Six groups of seven is equal to 42. The whole is 42.

Mental strategies

Pupils have experienced a range of mental strategies for all four operations, including:

Applying number bonds to 10 and 100 to calculate how many more/less to the next multiple of ten, extending to 100 and 1000, using the 'make 10' strategy.

Identifying numbers close to a multiple of ten or 100 e.g. 28, 201 and using a round and adjust strategy, including for multiplication. *"If I know 20 x 4 is 80, then 19 x 4 is 76".*

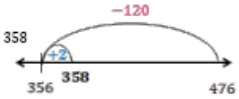
Identifying near doubles for addition. *43 and 45 can be seen as 'double 43 plus two.*

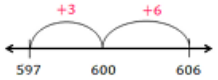
Subtracting numbers close together in value, through counting on to find the difference.

Once secure, these can be applied to larger integers and decimal values.

336 + 127 = ? *I can partition 27 into 123 and 4. 336 plus 4 is equal to 340. 340 plus 123 is equal to 463.*

476 – 118 = 358

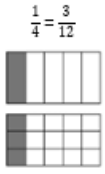


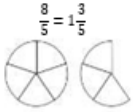


606 – 597 = ? *I can count on from 597 to 606. The difference is 9.*

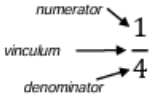
Representing fractions

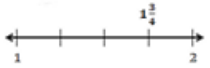
Pupils will have represented unit, non-unit and improper fractions in a variety of ways including area, part of a set and on a number line. Through representations they understand equivalence. They have identified non-unit fractions of quantities.





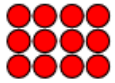
Two thirds of 120 is 40





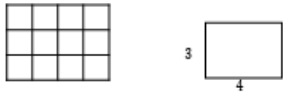
Representing multiplicative relationships

Pupils have used an increasing range of models to represent multiplicative relationships and use these to describe inverse relationships and commutativity.



There are three rows with a value of four. There are four columns with a value of 3.
3 × 4 = 12 4 × 3 = 12
12 ÷ 4 = 3 12 ÷ 3 = 4

Three groups of four are equal to 12.
Four groups of three are equal to 12.



Applying Conditional Knowledge Through Reasoning and Problem-Solving

A key feature of *Mathematics Mastery* is its focus on mathematical thinking. Pupils are explicitly taught when and why to apply different strategies through guided reasoning and problem-solving activities. Lessons include structured discussions, where pupils explain their reasoning using precise mathematical language, helping them develop a flexible and strategic approach to problem-solving. The tasks pupils encounter encourage them to apply their knowledge in unfamiliar contexts, deepening their understanding.

Carefully Sequencing Learning for Long-Term Understanding

Following the *Mathematics Mastery* curriculum, we ensure learning is sequenced to build upon prior knowledge. Concepts are revisited through cumulative review, allowing pupils to make connections and transfer their understanding across different topics. For example, multiplication facts are embedded before introducing area, ensuring pupils have the necessary foundations to engage with new content successfully.

By embedding *Mathematics Mastery* principles into our teaching, we ensure that pupils at Richmond Hill Primary not only develop fluency in mathematical facts and methods but also become confident, independent problem-solvers who can reason mathematically and apply their learning effectively.

Implementation

Pedagogical Approach

All maths lessons are taught with the pre-requisite of high expectations. At Richmond Hill, this means:

- Pupils believe they can achieve; they want to learn and enjoy learning maths.

- Teachers convey that progress is made through engagement and effort, expects every child to succeed, and is enthusiastic about the learning expected.

Lessons follow a 6-part structure as set out below.

Section	Key Points
Do Now (max 5 mins)	- Everyone is engaged in the task, 100% of the time. - Everyone experiences success with no taught input. - Involves opportunities for pupils to retrieve knowledge and consolidate prior learning. - Pupils either practice something that will help them later in the lesson or build fluency in a key skill.
New Learning	- Everyone says the most important star words. - The teacher (and children ideally) model using concrete manipulatives. - Everyone uses words and symbols accurately. - Everyone is ready to answer questions. - Everyone answers in full sentences. - Misconceptions are anticipated and incorporated. - The Talk Task/Let's Explore task is modelled.
Talk Task / Let's Explore	- Everyone is speaking in full sentences. - Everyone uses words and symbols accurately. - Everyone is manipulating objects when appropriate. - Recording is not expected.
Develop Learning	- References are made to previously learnt models, representations, skills, or concepts. - Everyone is ready to answer questions. - Everyone answers in full sentences. - Everyone uses words and symbols accurately. - Misconceptions are anticipated and incorporated. - The Independent Task is modelled.
Independent Task	- Everyone is engaged in completing the task, 100% of the time. - Everyone has access to appropriate concrete manipulatives. - Everyone is engaged in learning about the same mathematical concept or skill, with an appropriate amount of scaffolding. - Emphasis on understanding and developing fluency, not rushing to 'cover' ideas. - Further tasks involve deeper understanding of the same mathematical concept or skill through: - Solving fewer routine problems. - Demonstrating using concrete manipulatives or drawing diagrams. - Explaining in full sentences or asking their own questions.
Plenary	- Could include opportunities for: - Pupils reflecting on their learning. - Addressing any misconceptions. - Deepening pupils' understanding. - Extending pupils' learning from a different perspective. - Celebrate success and reaffirm that success comes from effort.

Fundamentals of Learning

The Mathematics Mastery curriculum is cumulative. Concepts taught earlier are revisited in the context of new areas of mathematics, helping pupils make connections between different concepts. Regular retrieval, application, and transfer of knowledge to new contexts foster both fluency and conceptual understanding. Ready to Progress interventions, Maths Meetings, transitions, and Do Now's give pupils more time to practice essential facts and methods. The curriculum is knowledge-rich and precisely defined, with a clearly specified body of core knowledge outlined in the Programmes of Study for each year group. Pupils have multiple opportunities to rehearse key facts through Do Now's, Maths Meetings, and the cumulative nature of the curriculum. Additionally, extended time is dedicated to each strand of mathematics, allowing teachers to focus on deepening pupils' conceptual understanding and fostering connections between different areas of mathematics.

Supporting Struggling Learners

For pupils who are still working on foundational maths skills, further support is given to ensure that this foundational knowledge is mastered. Pupils will still have access to their age-appropriate curriculum with adaptive strategies where needed to support individual barriers to learning, and will be exposed to reasoning and problem solving with further adaptive strategies. However, the main focus will be on ensuring that these children master the foundational skills needed first. Therefore, additional intervention will be provided; this may be in the form pre or post teaching sessions or the use of Mathematics Mastery 'Ready to Progress' materials.

Assessment

Assessment is central to ensuring all pupils develop a deep and lasting understanding of mathematics. At Richmond Hill, we use a combination of formative and summative assessment to track progress, identify misconceptions, and inform next steps in teaching.

Formative Assessment: Assessing Learning in Every Lesson

Formative assessment is embedded throughout our lessons to check pupils' understanding and guide responsive teaching. Teachers use:

- **'Do Now' Tasks** – Quick retrieval practice at the start of lessons to consolidate prior learning and assess retention.
- **Questioning & Discussion** – Targeted questioning strategies, such as *Think, Pair, Share*, to assess reasoning and depth of understanding.
- **Live Feedback & Marking** – Immediate feedback is provided within lessons to address misconceptions in real time.
- **Hinge Questions** – Carefully planned checkpoint questions during teaching to inform next steps and adjust instruction.
- **Mathematical Talk & Justification** – Pupils explain their reasoning using sentence stems and structured discussions, enabling teachers to assess conceptual understanding.
- **Maths Meetings** – A dedicated time for revisiting key concepts, reinforcing fluency, and identifying gaps in understanding. These regular sessions serve as both a retrieval tool and an ongoing formative assessment opportunity, allowing teachers to address misconceptions and adapt teaching accordingly. By embedding

Maths Meetings and retrieval-based strategies within daily practice, we ensure pupils continually reinforce and build upon their mathematical knowledge, strengthening their fluency and problem-solving skills.

Summative Assessment: Measuring Progress Over Time

To evaluate long-term learning and mastery, we use summative assessments at key points throughout the year:

- **STAR Assessment (Termly)** – Standardised termly assessments provide a clear measure of progress, identifying strengths and areas for development. This data informs intervention planning and whole class teaching adaptations.
- **Tracking and Progress Meetings** – Teachers and leaders analyse assessment data to ensure all pupils are on track, identify those requiring additional support, and set targets for future learning.

Progression of National Curriculum Composites

Spoken Language - The national curriculum for mathematics reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof. They must be assisted in making their thinking clear to themselves as well as others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Number – Number and Place Value	• count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number • count, read and write numbers to 100 in	• count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward • recognise the place value of each digit in a two-digit number (10s, 1s)	• count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number • recognise the place value of each digit in a	• count in multiples of 6, 7, 9, 25 and 1,000 • find 1,000 more or less than a given number	• 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	• read, write, order and compare numbers up to 10,000,000 and determine the value of each digit • round any whole

	numerals; count in multiples of 2s, 5s and 10s • given a number, identify 1 more and 1 less • identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • read and write numbers from 1 to 20 in numerals and words	• identify, represent and estimate numbers using different representations, including the number line • compare and order numbers from 0 up to 100; use <, > and = signs • read and write numbers to at least 100 in numerals and in words • use place value and number facts to solve problems	3-digit number (100s, 10s, 1s) • compare and order numbers up to 1,000 • identify, represent and estimate numbers using different representations • read and write numbers up to 1,000 in numerals and in words • solve number problems and practical problems involving these ideas	• count backwards through 0 to include negative numbers • recognise the place value of each digit in a four-digit number (1,000s, 100s, 10s, and 1s) • order and compare numbers beyond 1,000 • identify, represent and estimate numbers using different representations • round any number to the nearest	powers of 10 for any given number up to 1,000,000 • interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through 0 • round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000 • solve number problems and practical problems that involve all of the above • read Roman numerals to 1,000 (M) and recognise years written in Roman numerals	number to a required degree of accuracy • use negative numbers in context, and calculate intervals across 0 • solve number and practical problems that involve all of the above

				10, 100 or 1,000 • solve number and practical problems that involve all of the above and with increasingly large positive numbers • read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of 0 and place value		

Number – Addition and Subtraction	• read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs
	• represent and use number bonds and related subtraction facts within 20
	• add and subtract one-digit and two-digit numbers to 20, including 0
	• solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? − 9
		• solve problems with addition and subtraction:
		  • using concrete objects and pictorial representations, including those involving numbers, quantities and measures
		  • applying their increasing knowledge of mental and written methods
		• recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
		• add and subtract numbers using
			• add and subtract numbers mentally, including:
			  • a three-digit number and 1s
			  • a three-digit number and 10s
			  • a three-digit number and 100s
			• add and subtract numbers with up to 3 digits, using formal written methods of
				• add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
				• estimate and use inverse operations to check answers to a calculation
				• solve addition and subtraction two-step problems in contexts, deciding
					• add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
					• add and subtract numbers mentally with increasingly large numbers
					• use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
					• solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
						• multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
						• divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
						• divide numbers up to 4 digits by

		concrete objects, pictorial representations, and mentally, including: • a two-digit number and 1s • a two-digit number and 10s • 2 two-digit numbers • adding 3 one-digit numbers • show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot • recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems	columnar addition and subtraction • estimate the answer to a calculation and use inverse operations to check answers • solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	which operations and methods to use and why		a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context • perform mental calculations, including with mixed operations and large numbers • identify common factors, common multiples and prime numbers • use their knowledge of the order of operations to carry out calculations involving the 4 operations

Number – Multiplication and Dviison	• solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	• recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs • show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication	• recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables • write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods • solve problems, including missing number	• recall multiplication and division facts for multiplication tables up to 12 × 12 • use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers • recognise and use factor pairs and commuta	• identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers • know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers • establish whether a number up to 100 is prime and recall prime numbers up to 19 • multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication	• solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why • solve problems involving addition, subtraction, multiplication and division • use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

		and division facts, including problems in contexts	problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects	tivity in mental calculations • multiply two-digit and three-digit numbers by a one-digit number using formal written layout • solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder	for two-digit numbers • multiply and divide numbers mentally, drawing upon known facts • divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context • multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000 • recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)	

				correspondence problems such as n objects are connected to m objects	• solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes • solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign • solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates	

Number – Fractions (From Y4, Including Decimals, From Y5 including Decimals and Percentages)	• recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity • recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity	• recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity • write simple fractions, for example $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$	• count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 • recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators • recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators • recognise and show, using	• recognise and show, using diagrams, families of common equivalent fractions • count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10 • solve problems involving increasingly harder fractions to calculate quantities	• compare and order fractions whose denominators are all multiples of the same number • identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths • recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $\frac{2}{5}$ + $\frac{4}{5}$ = $\frac{6}{5}$ = 1 $\frac{1}{5}$]	• use common factors to simplify fractions; use common multiples to express fractions in the same denomination • compare and order fractions, including fractions >1 • add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions • multiply simple pairs of proper fractions, writing the answer in its simplest form [for

			diagrams, equivalent fractions with small denominators • add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$] • compare and order unit fractions, and fractions with the same denominators • solve problems that involve all of the above	, and fractions to divide quantities, including non-unit fractions where the answer is a whole number • add and subtract fractions with the same denominator • recognise and write decimal equivalents of any number of tenths or hundreds • recognise and write decimal equivalents	• add and subtract fractions with the same denominator, and denominators that are multiples of the same number • multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams • read and write decimal numbers as fractions [for example, 0.71 $= \frac{71}{100}$] • recognise and use thousandths and relate them to tenths, hundredths	example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$] • divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$] • associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$] • identify the value of each digit in numbers given to 3 decimal places and multiply and divide numbers by 10, 100 and 1,000 giving

				to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ • find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths • round decimals with 1 decimal place to the nearest whole number • compare numbers with the same number	and decimal equivalents • round decimals with 2 decimal places to the nearest whole number and to 1 decimal place • read, write, order and compare numbers with up to 3 decimal places • solve problems involving number up to 3 decimal places • recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per 100', and write percentages as a fraction with denominator 100, and as a decimal fraction	answers up to 3 decimal places • multiply one-digit numbers with up to 2 decimal places by whole numbers • use written division methods in cases where the answer has up to 2 decimal places • solve problems which require answers to be rounded to specified degrees of accuracy • recall and use equivalences between simple fractions, decimals and percentages, including in different contexts

				of decimal places up to 2 decimal places • solve simple measure and money problems involving fractions and decimals to 2 decimal places	• solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25	
Measurement	• compare, describe and solve practical problems for: • lengths and heights [for example, long/short, longer/shorter, tall/sh	• choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales,	• 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	• convert between different units of measure [for example, kilometre to metre; hour to minute] • measure and calculate the perimeter	• convert between different units of metric measure [for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre]	• solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate • use, read, write and convert

		ort, double /half] • mass/ weight [for example, heavy/ light, heavier than, lighter than] • capacity and volume [for example, full/empty, more than, less than, half, half full, quarter] • time [for example, quicker	thermometers and measuring vessels • compare and order lengths, mass, volume/capacity and record the results using >, < and = • recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value • find different combinations of coins that equal the same amounts of money • solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change • compare and sequence intervals of time • tell and write the time to five minutes, including	give change, using both £ and p in practical contexts • tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks • estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, am/pm, morning, afternoon,	of a rectilinear figure (including squares) in centimetres and metres • find the area of rectilinear shapes by counting squares • estimate, compare and calculate different measures, including money in pounds and pence • read, write and convert time between analogue and digital 12- and 24-	• understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints • measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • calculate and compare the area of rectangles (including squares), including using standard units, square centimetres (cm^2) and square metres (m^2), and estimate the area of irregular shapes	between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3 decimal places • convert between miles and kilometres • recognise that shapes with the same areas can have different perimeters and vice versa • recognise when it is possible to use formulae

	, slower, earlier, later]
	• measure and begin to record the following:
	  • lengths and heights
	  • mass/ weight
	  • capacity and volume
	  • time (hours, minutes, seconds)
	  • recognise and know the value of different denominations of coins and notes
		quarter past/to the hour and draw the hands on a clock face to show these times
		• know the number of minutes in an hour and the number of hours in a day
			noon and midnight
			• know the number of seconds in a minute and the number of days in each month, year and leap year
			• compare durations of events [for example, to calculate the time taken by particular events or tasks]
				hour clocks
				• solve problems involving converting from hours to minutes, minutes to seconds, years to months, weeks to days
					• estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water]
					• solve problems involving converting between units of time
					• use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling
						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 (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3]

	• sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] • recognise and use language relating to dates, including days of the week, weeks,					

	months and years • tell the time to the hour and half past the hour and draw the hands on a clock face to show these times					

Geometry – Properties of Shapes	• recognise and name common 2-D and 3-D shapes, including:
	  • 2-D shapes [for example, rectangles (including squares), circles and triangles]
	  • 3-D shapes [for example,
		• identify and describe the properties of 2-D shapes, including the number of sides, and line symmetry in a vertical line
		• identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces
		• identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]
		• compare and sort common 2-D and
			• draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them
			• recognise angles as a property of shape or a description of a turn
			• identify right angles, recognise that 2 right angles make a half-turn, 3 make three-
				• compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes
				• identify acute and obtuse angles and compare and order angles up to 2 right angles by size
					• identify 3-D shapes, including cubes and other cuboids, from 2-D representations
					• know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
					• draw given angles, and measure them in degrees (°)
					• identify:
					  • angles at a point and 1
						• draw 2-D shapes using given dimensions and angles
						• recognise, describe and build simple 3-D shapes, including making nets
						• compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons

	cuboids (including cubes), pyramids and spheres]	3-D shapes and everyday objects	quarters of a turn and 4 a complete turn; identify whether angles are greater than or less than a right angle • identify horizontal and vertical lines and pairs of perpendicular and parallel lines	• identify lines of symmetry in 2-D shapes presented in different orientations • complete a simple symmetric figure with respect to a specific line of symmetry	whole turn (total 360°) • angles at a point on a straight line and half a turn (total 180°) • other multiples of 90° • use the properties of rectangles to deduce related facts and find missing	• 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

					• lengths and angles • distinguish between regular and irregular polygons based on reasoning about equal sides and angles	
Geometry – Position and Direction	• describe position, direction and movement, including whole, half, quarter and three-quarter turns	• order and arrange combinations of mathematical objects in patterns and sequences • use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and		• describe positions on a 2-D grid as coordinates in the first quadrant • describe movements between positions	• identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the	• describe positions on the full coordinate grid (all 4 quadrants) • draw and translate simple shapes on the coordinate plane, and

		distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)		as translations of a given unit to the left/right and up/down • plot specified points and draw sides to complete a given polygon	shape has not changed	reflect them in the axes
Statistics		• interpret and construct simple pictograms, tally charts, block diagrams and tables • ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity • ask-and-answer questions about totalling and comparing categorical data	• interpret and present data using bar charts, pictograms and tables • solve one-step and two-step questions [for example 'How many more?' and 'How many fewer?'] using information presented in scaled bar	• interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs • solve comparison, sum	• solve comparison, sum and difference problems using information presented in a line graph • complete, read and interpret information in tables, including timetables	• interpret and construct pie charts and line graphs and use these to solve problems • calculate and interpret the mean as an average

			charts and pictograms and tables	and difference problems using information presented in bar charts, pictograms, tables and other graphs		
Ratio and Proportion						• solve problems involving the relative sizes of 2 quantities where missing values can be found by using integer multiplication and division facts • solve problems involving the calculation of percentages [for example, of measures

						and such as 15% of 360] and the use of percentages for comparison • solve problems involving similar shapes where the scale factor is known or can be found • solve problems involving unequal sharing and grouping using knowledge of fractions and multiples
Algebra						• use simple formulae • generate and describe linear number sequences

						• express missing number problems algebraically • find pairs of numbers that satisfy an equation with 2 unknowns • enumerate possibilities of combinations of 2 variables

Planning for Excellence in Mathematics

(Component Knowledge Progression)

Strand Progression and Concept Breakdown

The information below shows how the **composite knowledge** above has been broken down into **component knowledge**. The overviews outline the school's sequential approach to teaching each strand of the curriculum. Additionally, within each strand, there is a concept breakdown that demonstrates progression across each year group.

This information should be viewed alongside our 'Progression in Calculations'.

Place value: Overview

Concepts: Representing, Counting, Comparing, Problem solving and rounding

"One more than three is four"

"15 is one more than 14. 14 is one less than 15."

"Sixty two is greater than twenty six."
62 > 26

"Ten greater than 146 is 156. The tens digit increases by one which makes 5 tens."
146 < 156

Reception

- Develop an understanding of zero
- Develop number sense (one-one correspondence, cardinality, ordinality and conservation of number, subitising and abstraction)
- Identify and represent numbers : 0-10 (progressing to 20)
- Count on and back reliably: 0-50
- Say which number is one more or one less than a given number

Year 1

- Read and write numbers in numerals: 0-100 and words: 0-20
- Identify and represent numbers: 0-20 (progressing to 100)
- Count to and across, forwards and backwards in ones, count in twos, fives, and ten: 0-100
- Identifying one more one less: 0-100

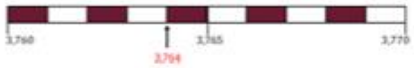
Year 2

- Read and write in numerals and words; recognise the place value of each digit: 0-100 (0-1000)
- Identify, represent and estimate numbers : 0-100 (progressing to 1000)
- Count in twos, threes, fives and tens; forward and backward: 0-100
- Compare and order number; use <, > and = signs: 0-100 (0-1000)
- Use place value and number facts to solve problems

Year 3

- Read and write in numerals and words; recognise the place value of each digit: 0-1000 (10,000)
- Identify, represent and estimate numbers using different representations: 0-1000 (progressing to 10,000)
- Count from 0 in multiples of 4, 8 50 and 100; find 10 or 100 (1000) more or less than a given number
- Compare and order numbers: 0-1000 (10,000)
- Round numbers to the nearest 10 and 100 (1000)
- Solve number problems and practical problems involving these ideas

"My number is less than your number because..."



Year 4

- Recognise the place value of each digit: 0-10,000
- Identify, represent and estimate numbers using different representations: 0-10,000
- Read Roman numerals: 0-100
- Count in multiples of 6, 7, 9, 25 and 1000; find 1000 more or less than a given number
- Count backwards through zero: negative numbers
- Compare and order numbers: beyond 1000
- Round any number to the nearest 10, 100 or 1000
- Solve number and practical problems involving these ideas, with increasingly large positive numbers

Year 5

- Read, write, order and compare numbers; recognise the place the value of each digit: 0-1,000,000 and beyond
- Read Roman numerals: 0-1,000
- Count forwards or backwards in steps of powers of 10: 0-1,000,000
- Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero (calculate intervals across zero)
- Round any number to the nearest 10, 100, 1,000, 10,000 and 100,000: 0-1,000,000
- Solve number problems and practical problems that involve all of the above

Year 6

- Read, write, order and compare numbers; recognise the place value of each digit: 0- 10,000,000
- Use negative numbers in context, and calculate intervals across zero
- Round any whole number to a required degree of accuracy
- Solve number and practical problems that involve all of the above

Place value: Concept breakdown

Notes:
- *Our progression map in Place Value covers **integer** (whole number) place value only, please see the Fractions, Decimals and Percentages progression map for decimal place value.*
- *Statutory Curriculum requirements are in* **bold**

	Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
Understanding and representing number							
Representing numbers	**Identify and represent numbers 1-10** Unit 2 (1-3); Unit 3 (1-6); Unit 7 (1-10)	**Identify and represent numbers using objects and pictorial representations including the number line: 0-20** Unit 1 (within 10); Unit 4 (within 20)	**Identify, represent and estimate representations: 0-100** *(progressing to 1000)* Unit 1; Unit 12 (within 1000)	**Identify, represent and estimate numbers using different representations: 0-1000** *(progressing to 10,000)* Unit 2; Unit 13 (4-digit numbers)	**Identify, represent and estimate numbers using different representations: 0-10,000** Unit 1		
Using numerals		**Read and write numbers 0-20 in numerals and words: (progressing to 100 in numerals)** Unit 1 (within 10); Unit 4 (within 20) ; Unit 8 (within 50); Unit 12 (within 100)	**Read and write in numerals and words (0-100)** Unit 1	**Read and write in numerals and words (0-1000)** Unit 2;		**Read and write in numerals and words: 0-1,000,000 and beyond** Unit 1	**Read, write, order and compare numbers; 0-10,000,00** Unit 1
Roman numerals					**Read Roman numerals: 0-100** Unit 13	**Read Roman numerals: 0-1,000** Unit 1	
Understanding value	**Develop understanding of numbers to 0-10; Subitise to 5** Unit 2 (1-3); Unit 3 (1-6); Unit 4 (zero); Unit 7 (1-10)		**Recognise the place value of each digit: 0-100** *(progressing to 0-1000)* Unit 1; Unit 12 (within 1000)	**Recognise the place value of each digit: 0-1000** *(progressing to 10,000)* Unit 2; Unit 13 (4-digit numbers)	**Recognise the place value of each digit: 0-10,000** Unit 1	**Recognise the place the value of each digit: 0-1,000,000 and beyond** Unit 1	**Recognise the place value of each digit: 0- 10,000,000** Unit 1
Counting							
Counting in ones	**Count on and back reliably: 0-20 and beyond** Unit 2 (1-3); Unit 3 (1-6); Unit 7 (1-10); Unit 11 (1-15); Unit 15 (1-20)	**Count to and across, forwards and backwards in ones: 0-100** Unit 1 (within 10); Unit 4 (within 20)			**Count backwards through zero: negative numbers** Unit 13		

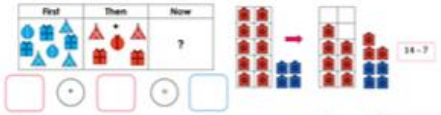
	Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
Counting (continued)							
Skip-counting		**Count in twos, fives and ten: 0-100** Unit 1 and Unit 4 Do Nows and Transitions (2s and 5); Unit 8; Unit 15 (application)	**Count in twos, threes, fives and tens; forward and backward: 0-100** Unit 1 (during transitions)	**Count from 0 in multiples of 4, 8 50 and 100; find 10 or 100 (1000) more or less than a given number** Unit 2 (50 and 100 during transitions); Unit 6 (4s); Unit 7 (8s)	**Count in multiples of 6, 7, 9, 25 and 1000; find 1000 more or less than a given number** Unit 1 (powers of 10, 50s and 25s in transitions); Unit 3	**Count forwards or backwards in steps of powers of 10: 0-1,000,000** Unit 1 (during transitions)	
Negative numbers					**Count backwards through 0 to include negative numbers** Unit 13	**Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero** Unit 9 (coordinates context); Unit 14	**Use negative numbers in context, and calculate intervals across zero** Unit 6 (coordinates context) Additional resources
Comparing							
Compare and order	**Say which number is one more or one less than a given number within 10** Unit 3; Unit 7	**Identifying one more one less: 0-100; use the language of: equal to, more than, less than (fewer), most, least** Unit 1 ; Unit 4; Unit 8	**Compare and order number; 0-100 (progressing to 0-1000); use <, > and = signs** Unit 1; Unit 12 (within 1000)	**Compare and order numbers: 0-1000** *(progressing to 10,000)* Unit 1 (to 100); Unit 2; Unit 13 (4-digit numbers)	**Compare and order numbers: beyond 1000** Unit 1	**Compare and order numbers; 0-1,000,000 and beyond** Unit 1	**Compare numbers: 0- 10,000,000** Unit 1
Problem solving and rounding							
Rounding				**Round numbers to the nearest 10 and 100** *(progressing to nearest 1000)* Unit 2; Unit 13 (nearest 100)	**Round any number to the nearest 10, 100 or 1000** Unit 1	**Round any number to the nearest 10, 100, 1,000, 10,000 and 100,000: 0-1,000,000** Unit 1	**Round any whole number to a required degree of accuracy** Unit 1
Practical problems			**Use place value and number facts to solve problems** Unit 1; Unit 12	**Solve number problems and practical problems involving these ideas** Unit 2	**Solve number and practical problems involving these ideas, with increasingly large positive numbers** Unit 1	**Solve number problems and practical problems that involve all of the above** Unit 1	**Solve number and practical problems that involve all of the above** Unit 1

Addition and Subtraction: Overview

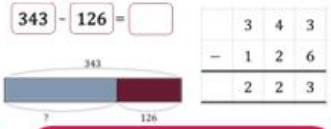
Concepts:, Number bonds, Understanding additive relationships Calculation strategies, Solving problems

For further guidance see our Progressions in Calculations

First there were four passengers.
Then ___ joined the carriage.
Now there are ___ passengers.



"I will partition 36 into 30 and 6. I will partition 23 into 20 and 3. I will use my number bonds to help me."



	3	4	3
−	1	2	6
	2	2	3

Reception

- Automatically recall number bonds for numbers 0–5 (progressing to some numbers bonds within 10)
- Adding two single digit numbers within 10 by counting all or counting on.
- Subtracting two single digit numbers within 10 by taking away and through partitioning
- Explore additive problems in context using 'first, then now' structure.

Year 1

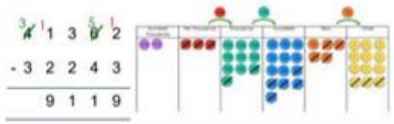
- Represent and use number bonds and related subtraction facts within 20
- Read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs
- Add and subtract one-digit and two-digit numbers to 20, including zero, using a range of strategies including: *count all, count on, count back, make ten, partitioning and use of known facts.*
- Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems

Year 2

- Recall and use number bonds within 20 fluently, and derive and use related facts up to 100
- Show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
- Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: *a two-digit number and 1s, a two-digit number and 10s, 2 two-digit numbers, adding 3 one-digit numbers.*
- Solve problems with addition and subtraction including numbers, quantities and measures

Year 3

- Estimate the answer to a calculation and use inverse operations to check answers
- Add and subtract mentally including adding 1s, 10s and 100s to a three-digit number
- Add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction
- Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction



	6	2	5	6
+	2	9	3	3

Year 4

- Estimate and use inverse operations to check answers to a calculation
- Apply mental strategies including using known facts to numbers within 10000.
- Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
- Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why

Year 5

- Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
- Add and subtract numbers mentally with increasingly large numbers
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

Year 6

- Use their knowledge of the order of operations to carry out calculations involving the 4 operations
- Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
- Perform mental calculations, including with mixed operations and large numbers
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- Solve problems involving all four operations

Addition and Subtraction: Concept breakdown

Note: Statutory Curriculum requirements are in **bold**

	Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
	Number bonds						
Recall number bonds	**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.** Unit 4 (within 5); Unit 9 (within 10)	**Represent and use number bonds and related subtraction facts within 20** Unit 2 (within 10) Unit 5; Unit 7; Unit 9; Unit 13 (within 20)	**Recall and use number bonds within 20 fluently; Derive and use related facts up to 100** Unit 2; Unit 9; Unit 15	*In KS2 Pupils continue to use and apply known facts to adding and subtracting within larger numbers. E.g. If I know 14 + 5 = 19 Then I know 1400 + 500 = 1900* E.g. Y4 Unit 2			
	Understanding Additive Relationships						
Additive structures		**Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs** Unit 2 Unit 5; Unit 7; Unit 9; Unit 13	**Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot** Unit 2; Unit 9; Unit 15				**Use their knowledge of the order of operations to carry out calculations involving the four operations** Unit 3
	Throughout all primary years, pupils build their understanding of change structures (augmentation and reduction), part-whole structures (aggregation and partitioning) and comparative structures (difference, comparative addition and comparative subtraction). For further guidance see our Progressions in Calculations						
Using the inverse and checking answers			**Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.** Unit 3 (Do Nows)	**Estimate the answer to a calculation and use inverse operations to check answers** Unit 4	**Estimate and use inverse operations to check answers to a calculation** Unit 2	**Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy** Unit 2	**Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.** Unit 1

	Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
Calculation Strategies							
Mental strategies	**Adding and subtract two single digit numbers within 10** by counting all or counting on (addition) or taking away or partitioning (subtraction). Unit 9	**Add and subtract one and two digit numbers (including zero) within 20** *using counting on, Make ten strategy, known facts or partitioning.* Unit 2 (1 digit within 10) Unit 5; Unit 7; Unit 9; Unit 13	**Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and 1s, a two-digit number and 10s, 2 two-digit numbers, adding 3 one-digit numbers.** Unit 2; Unit 9; Unit 15	**Add and subtract mentally including adding 1s, 10s and 100s to a three-digit number** Unit 1; Unit 4; Unit 13	*Apply mental strategies including using known facts to numbers within 10000; add 1000 or subtract to a given number* Unit 2	**Add and subtract numbers mentally with increasingly large numbers** Unit 2 Unit 11 (with decimals)	**Perform mental calculations, including with mixed operations and large numbers** Unit 2
Written Strategies	.		*Begin to record addition and subtraction in columns alongside pictorial and concrete representations* Unit 15	**Add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction** Unit 4	**Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate** Unit 2	**Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)** Unit 2; Unit 11 (with decimals)	*Apply written methods to problems within 10,000,000* Unit 1
Solving problems							
Solving problems in context	*Explore additive problems in context using 'first, then now structure'.* Unit 9; Unit 14	**Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations** Unit 2 Unit 5; Unit 7; Unit 9; Unit 13; Unit 14	**Solve problems in context of measures and quantities, including problems involving addition and subtraction of money and giving change.** Unit 9; Unit 15	**Solve problems in context using number facts, place value, and more complex addition and subtraction** Unit 1; (number facts) Unit 4; Unit 11	**Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why** Unit 2 Unit 10	**Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why** Unit 2	**Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why** Unit 1
Missing numbers		**Solve missing number problems** *(within 10)* Unit 7	**Solve missing number problems** *(within 100)* Unit 3 (Do Nows); Unit 15	**Solve missing number problems** *(Within 1000)* Unit 4; Unit 13	*Pupils should continue to apply additive reasoning to practise missing number problems during their Maths Meetings and/or during their Arithmetic Sessions (Y5/6). See our guidance on Developing Fluency for more information.*		

Multiplication and Division: Overview

Concepts: Understanding multiplicative relationships, Multiplication and division facts, Calculation strategies, Solving problems

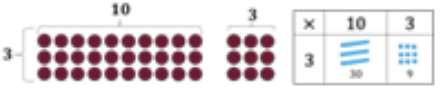
For further guidance see our Progressions in Calculations

"What can you see, how do you see it?"

"I can see 2 equal groups of 3!"

"The array shows five equal parts. Each part has a value of two."

"The array shows two equal parts. Each part has a value of five."



Reception

- Exploration of counting in equal groups
- Understand halving as splitting into two equal groups
- Recall some double facts within 10

Year 1

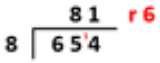
- Develop understanding of multiplication as replication of equal groups and of doubling and halving numbers and quantities
- Count in multiples of 2s, 5s and 10s
- Grouping and sharing small quantities
- Solve one-step problems involving multiplication and division using concrete objects, pictorial representations

Year 2

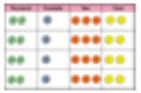
- Show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot
- Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward
- Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- Calculate mathematical statements for multiplication and division and write them using the ×, ÷ and = signs
- Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

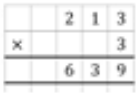
Year 3

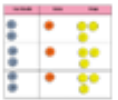
- Count from 0 in multiples of 4, 8, 50 and 100
- Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- Multiply and divide two-digit numbers by one-digit numbers, using mental and progressing to formal written methods
- Solve problems, including missing number problems, involving multiplication and division



"I partition both factors. Next, we multiply the first factor by the ones. Then, we multiply the first factor by the tens. Finally, we both add the partial products."







Year 4

- Count in multiples of 6, 7, 9, 25 and 1000
- Recall multiplication and division facts for multiplication tables up to 12 × 12
- Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers
- Recognise and use factor pairs and commutativity in mental calculations
- Multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems

Year 5

- Identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers
- Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers; establish whether a number up to 100 is prime and recall prime numbers up to 19
- Recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)
- Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
- Multiply and divide numbers mentally, drawing upon known facts
- Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context
- Multiply and divide whole numbers and decimals by 10, 100 and 1,000
- Solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes
- Solve problems involving four operations and problems that involve scaling by simple fractions or involving simple rates

Year 6

- Identify common factors, common multiples and prime numbers
- Use their knowledge of the order of operations to carry out calculations involving the 4 operations
- Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- Divide numbers up to 4 digits by a two-digit number using the formal written methods of short division or long division as appropriate, interpreting remainders according to the context
- Perform mental calculations, including with mixed operations and large numbers
- Solve problems involving four operations

Multiplication and Division: Concept breakdown

Note: Statutory Curriculum requirements are in **bold**

	Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
	Understanding multiplicative relationships						
Multiplicative structures	**Exploration of how quantities can be distributed equally;** *Understand halving as splitting into two equal groups* Unit 10; Unit 12	**Develop understanding of multiplication as replication of equal groups and of doubling and halving numbers and quantities** Unit 15	**Show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot** Unit 6; Unit 16	*Make connections between the 2, 4 and 8 times tables; Develop understanding of the relationship between multiplication and division, the commutative law and associative law* Unit 6	*Continue to develop understanding of the associative law and distributive law.* Unit 3		**Use their knowledge of the order of operations to carry out calculations involving the 4 operations** Unit 3
	Throughout all primary years, pupils build their understanding of repeated grouping structures (repeated addition, repeated subtraction/grouping and sharing), correspondence structures and scaling structures (times the size, times smaller, times as many and times fewer). For further guidance see our Progressions in Calculations						
Factors, multiples, primes and cube numbers				*Use the language of factors, multiples and products* Unit 6	**Recognise and use factor pairs and commutativity in mental calculations** Unit 3	**Identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers; Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers; Establish whether a number up to 100 is prime; Recall prime numbers up to 19; Recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)** Unit 4; Unit 13 (cube)	**Identify common factors, common multiples and prime numbers** Unit 2

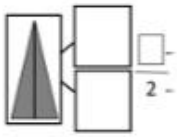
Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
Multiplication and division facts						
Multiplication tables and related division facts	**Recall some double facts within 10** Unit 12	Count in multiples of twos, fives and tens Unit 1 and 4 Do Nows/Transitions; Unit 8; Unit 15	**Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward; Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers** Unit 1 (transitions) Unit 6; Unit 16	**Count from 0 in multiples of 4, 8, 50 and 100; Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables** Unit 6; Unit 7	**Count in multiples of 6, 7, 9, 25 and 1000; Recall multiplication and division facts for multiplication tables up to 12 × 12** Unit 3	*Continue to practise multiplication table facts and related division facts through Maths Meetings and/or Arithmetic sessions.*	
Multiplying and dividing by powers of ten		**Count in multiples of ten** Unit 1 and 4 Do Nows/Transitions; Unit 8; Unit 15	**Recall multiplication facts for the 10 multiplication table** Unit 1 (transitions) Unit 6; Unit 16	*Multiply and divide numbers (within 100) by 10* Unit 7	*Multiply and divide numbers by 10 and 100 (within 1000)* Unit 3	**Multiply and divide whole numbers and decimals by 10, 100 and 1,000** Unit 4	*Continue to practise multiplying and dividing by powers of ten through Maths Meetings and/or Arithmetic sessions.*
Calculation strategies							
Mental Strategies		*Grouping and sharing small quantities* Unit 15	**Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs** Unit 6; Unit 16	**Multiply and divide two-digit numbers by one-digit numbers, using mental and progressing to formal written methods** Unit 7	**Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers** Unit 3	**Multiply and divide numbers mentally drawing upon known facts** Unit 4	**Perform mental calculations, including with mixed operations and large numbers** Unit 2

	Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
Calculation strategies (continued)							
Written Strategies			Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs Unit 6 Unit 16	Multiply and divide two-digit numbers by one-digit numbers, using mental and progressing to formal written methods Unit 7	Multiply two-digit and three-digit numbers by a one digit number using formal written layout; Unit 3 *Begin to divide 2 and 3 digit numbers by a 1 digit number using short division* Unit 5	Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers; Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context Unit 4	Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication; Divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context Unit 2
Problem Solving							
Problem Solving		Solve one-step problems involving multiplication and division using concrete objects, pictorial representations Unit 15	Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts Unit 6 Unit 16	Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects Unit 7 ; Unit 12	Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects Unit 5	Solve problems involving: - multiplication and division including using their knowledge of factors and multiples, squares and cubes - addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign -multiplication and division, including scaling by simple fractions and problems involving simple rates Unit 4	Solve problems involving addition, subtraction, multiplication and division Unit 2

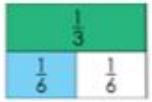
Fractions: Overview

unequal equal

"There are two equal parts."



Numerator
___ equal parts are highlighted
Denominator
There are ___ equal parts altogether



"Two sixths is equal to one third"

Concepts: Understanding fractions, Comparing fractions, Equivalences, Calculating with fractions

"Zero, one tenth, two tenths...."

Reception

- Exploration of counting in equal groups
- Understand halving as splitting into two equal groups

Year 1

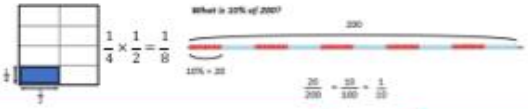
- Recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity
- Recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity

Year 2

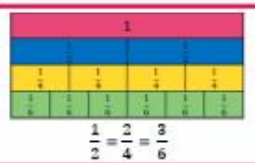
- Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity
- Write simple fractions, for example $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{2}{4}$.

Year 3

- Develop an understanding of tenths; count up and down in tenths
- Recognise, use as numbers, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators
- Compare and order unit fractions, and fractions with the same denominators
- Recognise and show, using diagrams, equivalent fractions with small denominators
- Add and subtract fractions with the same denominator within one whole
- Solve problems that involve all of the above



0.52 = 52 hundredths



$\frac{1}{2} = \frac{2}{4} = \frac{3}{6}$

Year 4

- Round decimals with 1 decimal place to the nearest whole number
- Develop understanding of hundredths
- Compare numbers with the same number of decimal places up to 2 decimal places
- Recognise and show, using diagrams, families of common equivalent fractions
- Recognise and write decimal equivalents of any number of tenths or hundreds, $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$
- Solve problems involving increasingly harder fractions to calculate quantities
- Add and subtract fractions with the same denominator
- Divide a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths
- Solve simple measure and money problems involving fractions and decimals to 2 decimal places

Year 5

- Recognise mixed numbers and improper fractions and convert from one form to the other
- Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
- Round decimals with 2 decimal places
- Read, write, order, compare and solve problems numbers with up to 3 decimal places
- Develop understanding of percentages (%) as a 'number of parts per 100'
- Compare and order fractions whose denominators are all multiples of the same number
- Read and write decimal numbers as fractions
- Identify, name and write equivalent fractions of a given fraction, including tenths and hundredths
- Add and subtract fractions with the same denominator, and denominators that are multiples of the same number
- Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
- Solve problems which require knowing percentage and decimal equivalents of common fractions

Year 6

- Use common factors to simplify fractions; use common multiples to express fractions in the same denomination
- Identify the value of each digit in numbers given to 3 decimal places
- Compare and order fractions, including fractions >1
- Recall and use equivalences between simple fractions, decimals and percentages
- Add and subtract fractions with different denominators and mixed numbers
- Multiply simple pairs of proper fractions
- Divide proper fractions by whole numbers
- Associate a fraction with division and calculate decimal fraction equivalents for a simple fraction
- Multiply/divide numbers by powers of 10 giving answers up to 3 decimal places
- Multiply one-digit numbers with up to 2 decimal places by whole numbers
- Use written division methods in cases where the answer has up to 2 decimal places
- Solve problems which require answers to be rounded to specified degrees of accuracy

Fractions: Concept breakdown

Note: Statutory Curriculum requirements are in **bold**

	Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
	Understanding fractions including decimals and percentages						
Recognising and representing fractions	*Exploration of counting in equal groups; Understand halving as splitting into two equal groups* Unit 10; Unit 12	**Recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity** Unit 10; Unit 15 **Recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity** Unit 10; Unit 15	**Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity** Unit 8 **Write simple fractions, for example $\frac{1}{2}$ of 6 = 3** Unit 8	**Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators** Unit 9 **Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators** Unit 9	*Pupils continue to develop understanding of interpretations of fractions including:* - *Fractions as a part of a whole* - *Fractions as a number* - *Fractions as a set* - *Fractions as a result of division* Unit 6	**Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $\frac{3}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$]** Unit 6	**Use common factors to simplify fractions; use common multiples to express fractions in the same denomination** Unit 4
Tenths, hundredths and thousandths				**Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10** Unit 9 ; *Pupils continue to embed during transitions and Maths Meetings*	**Count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10** Unit 8 *Pupils continue to embed during transitions and Maths Meetings*	**Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents** *Pupils continue to embed during transitions and Maths Meetings* Unit 6	*In Year 6 pupils continue to count in steps of tenths, hundredths and thousandths during Maths Meetings*
Representing decimals and percentages					*Pupils learn decimal notation and the language associated with it, including in the context of measurements.* Unit 8	**Read, write, order and compare numbers with up to 3 decimal places** Unit 6 **Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per 100'** Unit 8	**Identify the value of each digit in numbers given to 3 decimal places** Unit 1

Fractions: Concept breakdown

Note: Statutory Curriculum requirements are in **bold**

	Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
Comparing fractions including decimals							
Comparing fractions				**Compare and order unit fractions, and fractions with the same denominators** Unit 9	*Pupils continue to consolidate Y3 content with an emphasis on reasoning. They use pictorial representations to begin exploring different denominators (Y5 objective).* Unit 6	**Compare and order fractions whose denominators are all multiples of the same number** Unit 6	**Compare and order fractions, including fractions >1** Unit 4
Comparing Decimals					**Compare numbers with the same number of decimal places up to 2 decimal places** Unit 8	**Read, write, order and compare numbers with up to 3 decimal places** Unit 6	*Pupils continue to read, write, order and compare numbers with up to 3 decimal places* Unit 1
Equivalent fractions including decimals and percentages							
Fraction families			**Recognise the equivalence of $\frac{2}{4}$ and $\frac{2}{4}$** Unit 8	**Recognise and show, using diagrams, equivalent fractions with small denominators** Unit 9	**Recognise and show, using diagrams, families of common equivalent fractions** Unit 6	**Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths** Unit 6	
Equivalents between fractions, decimals and percentages					**Recognise and write decimal equivalents of any number of tenths or hundreds** Unit 8 **Recognise and write decimal equivalents of any number of tenths or hundreds, $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$** Unit 8	**Read and write decimal numbers as fractions [for example, 0.71 = $\frac{71}{100}$]** Unit 6 **Write percentages as a fraction with denominator 100, and as a decimal fraction** Unit 6 **Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25** Unit 8	**Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$]** Unit 4 **Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts** Unit 4

Fractions: Concept breakdown

Note: Statutory Curriculum requirements are in **bold**

Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
Calculating with fractions including decimals						
Add and subtract fractions			**Add and subtract fractions with the same denominator within one whole [for example $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$]** Unit 9	**Add and subtract fractions with the same denominator** Unit 6	**Add and subtract fractions with the same denominator, and denominators that are multiples of the same number** Unit 8	**Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions** Unit 4
Multiply and divide fractions					**Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams** Unit 8	**Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]** Unit 4 **Divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$]** Unit 4
Expressing answers as a decimal				**Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths** Unit 8	**Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000** Unit 11	**Multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places** Unit 2

Fractions: Concept breakdown

Note: Statutory Curriculum requirements are in **bold**

Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
Applying knowledge of fractions including decimals and percentages						
Applying knowledge of fractions		*Pupils apply understanding of halves and quarters whilst exploring half, quarter and three-quarter turns* Y1 Unit 10; Y2 Unit 11	**Solve problems that involve all of the above** Unit 6	**Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number** Unit 6		*Pupils apply understanding of fractions to express proportion and solve problems involving a scale factor of number or shape* Unit 10
Applying knowledge of decimals ad percentages				**Solve simple measure and money problems involving fractions and decimals to 2 decimal places** Unit 10	**Solve problems involving number up to 3 decimal places** Unit 11 **Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25** Unit 8	**Multiply one-digit numbers with up to 2 decimal places by whole numbers** Unit 4
Rounding Decimals				**Round decimals with 1 decimal place to the nearest whole number** Unit 8	**Round decimals with 2 decimal places to the nearest whole number and to 1 decimal place** Unit 6	**Solve problems which require answers to be rounded to specified degrees of accuracy** Unit 1

Ratio and proportion: Concept breakdown

Note: Statutory Curriculum requirements are in **bold**

Statements for Ratio and Proportion **only appear in the Year 6 National Curriculum** but should be connected to previous learning on multiplication and division, fractions, decimals and percentages and solving problems in context that involve scaling. These connections from the other curriculum strands have been mapped in Reception-Year 5 in this document.

	Reception and KS1 →	Year 3 →	Year 4 →	Year 5 →	Year 6
Early understanding of correspondence					
Early Correspondence	*Throughout EYFS and KS1 pupils gain confidence in using* ***one-to-one correspondence*** *e.g. when sharing equally into groups, "one for you, one for me". By Year 2, pupils should begin to explore* ***many-to-one correspondence*** *e.g. when using pictograms that use a symbol to represent 2, 5 or 10 objects as in* Y2 Unit 5				
Solving multiplicative problems in context that relate to scaling and ratio					
Scaling and ratio Problems	*Throughout Reception and KS1 pupils should explore early ideas around scaling when doubling, halving, sharing, grouping and multiplying. E.g. Jamie has twice as many as Rita.*	**Solve problems involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects** (from Multiplication and Division NC strand) Unit 7; Unit 12 *Solve simple problems in contexts, deciding which of the four operations to use and why. These include measuring and scaling contexts.* Unit 12	**Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects** (from Multiplication and Division NC strand) Unit 3; Unit 5 *Solve two-step problems in contexts choosing the appropriate operation, working with increasingly harder numbers. This should include correspondence questions such as the numbers of choices of a meal on a menu, or three cakes shared equally between 10 children.* Unit 10	**Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates** (from Multiplication and Division NC strand) Unit 4, Unit 8	**Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts** Unit 10 *Pupils begin to use the notation a:b to record their work* Unit 10 *Pupils solve problems involving unequal quantities, for example, 'for every egg you need three spoonfuls of flour',* Unit 10

Ratio and proportion: Concept breakdown

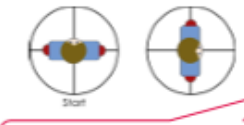
Note: Statutory Curriculum requirements are in **bold**

	Reception and KS1 →	Year 3 →	Year 4 →	Year 5 →	Year 6
Solving multiplicative problems in context that relate to scaling and ratio (continued)					
Scaling by powers of 10		*Understanding scaling by 10 as 'ten times as many'* Unit 7	*Solve problems involving scaling by 10 and 100* Unit 3	*Apply understanding of scaling to* **multiply and divide whole numbers and decimals by 10, 100 and 1,000** Unit 4	*Continue to practise multiplying and dividing by powers of ten through Maths Meetings and/or Arithmetic sessions.*
Connecting fractions, decimals and percentages to proportion					
Connecting fractions, decimals and percentages to proportion	*Throughout Reception – Year 3 pupils may begin to use simple fractions e.g. one half, in the context of proportion – showing how one amount relates to another. For example. "Half of the class are boys, half are girls." "Three quarters of the class have pets, One quarter does not have a pet."*	*Pupils begin to understand that decimals and fractions are different ways of expressing numbers and proportions.* Unit 6	*Pupils connect multiplication by a fraction to using fractions as operators (fractions of), and to division, building on work from previous years. This relates to scaling by simple fractions, including fractions > 1.* Unit 8 *Pupils should be taught throughout that percentages, decimals and fractions are different ways of expressing proportions* Unit 6, Unit 8	**Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison** Unit 5 *Pupils solve problems involving unequal quantities, for example, '$\frac{5}{3}$ of the class are boys'.* Unit 10
Solve scaling problems in the context of measures or shape					
Scaling in the context of measure or shape		*Pupils solve simple problems in contexts, deciding which of the four operations to use and why. These include measuring and scaling contexts.* Unit 12 *The comparison of measures includes simple scaling by integers (for example, a given quantity or measure is twice as long or five times as high) and this connects to multiplication* Unit 11	*Pupils continue to solve increasingly complex problems in contexts including measures and scaling.* Unit 10	**Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.** (from Measures NC strand) Unit 11	**Solve problems involving similar shapes where the scale factor is known or can be found** Unit 10

Geometry – Position and direction: Overview

Concepts: Describing position, Describing turn/movement, Pattern

Finish the pattern…



The man has turned a one quarter turn clockwise

Finish the pattern.
Describe what is happening.

I have used my angle maker and the top piece of card has made a quarter turn. It has made a right angle.

Reception

- To use mathematical language to describe position
- Select, rotate and manipulate shapes to develop spatial reasoning skills.
- Continue, copy and create repeating patterns

Year 1

- Describing position and direction using mathematical language including left and right.
- Describing movement, including half, quarter and three-quarter turns.
- Recognise and create repeating patterns

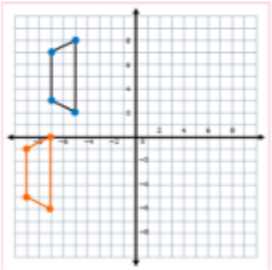
Year 2

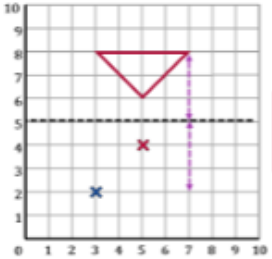
- Continue to describe position and direction using mathematical language
- Describe movement using mathematical language including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)
- Order and arrange combinations of mathematical objects in patterns and sequences

Year 3

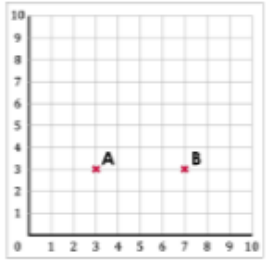
- Make connections between quarter turns and half turns to right angles.

Describe the translation. Identify the new coordinates





Reflect the shape through the mirror lined



Point __ is translated __ units up/ down/left/right to point __.

Year 6

- Describe positions on the full coordinate grid (all 4 quadrants)
- Draw and translate simple shapes on the coordinate plane, and reflect them in the axes

Year 5

- Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language
- Understand that the size and shape of an object does not change under translation and reflection

Year 4

- Describe positions on a 2-D grid as coordinates in the first quadrant
- Plot specified points and draw sides to complete a given polygon
- Describe movements between positions as translations of a given unit to the left/right and up/down
- Solve problems involving patterns

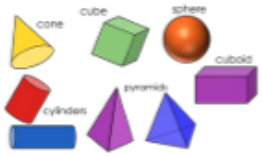
Geometry – Position and direction : Concept breakdown

	Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
Position, direction and movement							
Describing position	*Use mathematical language to describe position e.g. next to, in front, behind, between* Unit 6	*Pupils use the language of position, direction, including: left and right, top, middle and bottom, on top of, in front of, above, between, around, near, close and far, up and down, forwards and backwards, inside and outside.* Unit 3	**Use mathematical vocabulary to describe position and direction** Unit 11	*Pupils should continue to consolidate describing position and direction in Maths Meetings*	**Describe positions on a 2-D grid as coordinates in the first quadrant** Unit 12 **Plot specified points and draw sides to complete a given polygon** Unit 12	*Pupils continue to consolidate describing coordinates in the first quadrant and are introduced to other quadrants on the coordinates grid* Unit 9	**Describe positions on the full coordinate grid (all 4 quadrants)** Unit 8
Describing movements/transformations	*Select, rotate and manipulate shapes to develop spatial reasoning skills* Unit 6 Unit 13	**Describe position, direction and movement, including half, quarter and three-quarter turns.** Unit 3 Unit 10	**Use mathematical vocabulary to describe and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)** Unit 11	**Recognise angles as a property of shape or a description of a turn** (Properties of Shape NC strand) Unit 10	**Describe movements between positions as translations of a given unit to the left/right and up/down** Unit 12	**Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language** Unit 9 **Understand that the size and shape of an object does not change under translation and reflection** Unit 9	**Draw and translate simple shapes on the coordinate plane, and reflect them in the axes** Unit 8
Pattern							
Describing pattern	*Continue, copy and create repeating patterns* Unit 2	*Recognise and create repeating patterns* Unit 3	**Order and arrange combinations of mathematical objects in patterns and sequences** Unit 11	*Pupils should continue to consolidate describing and creating patterns Maths Meetings*	*Solve problems involving patterns* Unit 13	*Pupils should continue to consolidate solving problems involving patterns in Maths Meetings*	**Generate and describe linear number sequences** Unit 3

Geometry - properties of shape: Overview

Concepts: Identifying shapes and their properties, Classifying shapes, Drawing/Constructing shapes, Angles

This shape has straight sides.



The square has 4, vertices, 4 straight sides and four lines of symmetry.

The cube has six square faces, 8 vertices, 12 edges.

The triangle has one right angle and two angles that are smaller than a right angle.

Reception

- Explore characteristics of and begin to sort 3-D and 2-D shapes
- Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can
- Select, rotate and manipulate shapes to develop spatial reasoning skills

Year 1

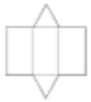
- Recognise and name common 2-D and 3-D shapes
- Sort 2-D and 3-D shapes with increasingly accurate mathematical vocabulary.

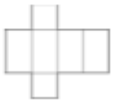
Year 2

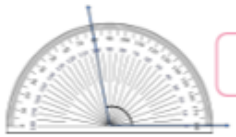
- Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line
- Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces
- Identify 2-D shapes on the surface of 3-D shapes
- Compare and sort common 2-D and 3-D shapes and everyday objects

Year 3

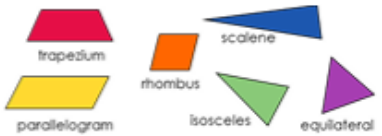
- Identify horizontal and vertical lines and pairs of perpendicular and parallel lines
- Recognise 3-D shapes in different orientations and describe them
- Draw 2-D shapes and make 3-D shapes using modelling materials
- Recognise angles as a property of shape or a description of a turn
- Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn;
- Identify whether angles are greater than or less than a right angle







This angle measures 140°.



Year 4

- Identify lines of symmetry in 2-D shapes presented in different orientations
- Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes
- Complete a simple symmetric figure with respect to a specific line of symmetry
- Identify acute and obtuse angles and compare and order angles up to two right angles by size

Year 5

- Identify 3-D shapes, including cubes and other cuboids, from 2-D representations
- Use the properties of rectangles to deduce related facts and find missing lengths and angles
- Distinguish between regular and irregular polygons based on reasoning about equal sides and angles
- Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
- Draw given angles, and measure them in degrees (°)
- Identify: angles at a point and one whole turn (total 360°) angles at a point on a straight line and half a turn (total 180°) other multiples of 90°

Year 6

- Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
- Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
- Recognise, describe and build simple 3-D shapes, including making nets
- Draw 2-D shapes using given dimensions and angles
- Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles

Geometry - properties of shape: Concept breakdown

Note: Statutory Curriculum requirements are in **bold**

	Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
	Identifying shapes and their properties						
2-D shape	*Pupils explore characteristics of 2-D shapes, using appropriate everyday and mathematical language to describe them* Unit 13 *Pupils should have opportunities built into continuous provision to compose and decompose shapes so that they recognise a shape can have other shapes within it, just as numbers can*	**Recognise and name common 2-D shapes [for example, rectangles (including squares), circles and triangles]** *Unit 3* *Pupils begin to justify their identification of a 2-D shape by describing the properties e.g. the shape has three straight sides and three vertices* *Unit 3*	**Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line** Unit 11	**Identify horizontal and vertical lines and pairs of perpendicular and parallel lines** Unit 10 *Pupils continue to develop understanding of lines of symmetry within 2-D shapes* Unit 10	**Identify lines of symmetry in 2-D shapes presented in different orientations** Unit 11 *Pupils identify different triangles for example, isosceles, equilateral, scalene) and quadrilaterals (for example, parallelogram, rhombus, trapezium).* Unit 11	**Use the properties of rectangles to deduce related facts and find missing lengths and angles** Unit 12 *Pupils continue to consolidate the identification of specific types of triangle and quadrilateral introduced in Year 4 and are introduced to properties of a circle in preparation for Year 6* Unit 12	**Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius** Unit 8
3-D Shape	*Pupils explore characteristics of 3-D shapes, using appropriate everyday and mathematical language to describe them.* Unit 6 *Pupils should have opportunities built into continuous provision to select rotate and manipulate shapes to develop their spatial reasoning skills*	**Recognise and name common 3-D shapes, [for example, cuboids (including cubes), pyramids and spheres]** *Unit 3* *Pupils begin to justify their identification of a 3-D shape by describing the properties e.g. the shape has square flat faces* *Unit 3*	**Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces** Unit 11 **Identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid** Unit 11	**Recognise 3-D shapes in different orientations and describe them** Unit 10	*Pupils continue to explore the properties of 3-D shapes, applying their understanding to solve problems* Unit 14	**Identify 3-D shapes, including cubes and other cuboids, from 2-D representations** Unit 12	**Recognise, describe and build simple 3-D shapes, including making nets** Unit 8

Geometry - properties of shape: Concept breakdown

Note: Statutory Curriculum requirements are in **bold**

	Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
Compare, classify and sort shapes							
Compare, classify and sort 2-Dand 3-D shapes	*Sort 2-D and 3-D shapes based upon their properties e.g. straight or curved sides, flat faces or curved surfaces* Unit 13	*Pupils continue to sort 2-D and 3-D shapes with increasingly accurate mathematical vocabulary* *Unit 3*	**Compare and sort common 2-D and 3-D shapes and everyday objects** *using* precise mathematical vocabulary *Unit 3*		**Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes** Unit 11	**Distinguish between regular and irregular polygons based on reasoning about equal sides and angles** Unit 12	**Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons** Unit 7
Drawing or constructing shapes							
Draw and construct 2-D/3-D shapes	*In continuous provision, pupils should be encouraged to copy simple shapes from a 3-D representation*		*Pupils will be introduced to drawing 2-D shapes when completing shape patterns, but there is no expectation here of creating an accurate drawing.* *Unit 3*	**Draw 2-D shapes and make 3-D shapes using modelling materials;** Unit 10	**Complete a simple symmetric figure with respect to a specific line of symmetry** Unit 11	*Pupils begin to explore construction of simple 3-D shapes including making nets* Unit 12	**Recognise, describe and build simple 3-D shapes, including making nets** Unit 8 **Draw 2-D shapes using given dimensions and angles** Unit 8

Geometry - properties of shape: Concept breakdown

Note: Statutory Curriculum requirements are in **bold**

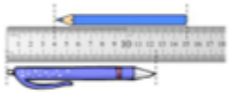
	Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
	Angles						
Understanding angles			*Pupils identify right angles in shapes* Unit 11	**Recognise angles as a property of shape or a description of a turn** Unit 10		**Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles** Unit 7	**Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles** Unit 7
Classifying, comparing and measuring angles				**Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn;** Unit 10 **Identify whether angles are greater than or less than a right angle;** *beginning to use the language of acute and obtuse* Unit 10	**Identify acute and obtuse angles and compare and order angles up to two right angles by size** Unit 11	**Draw given angles, and measure them in degrees (°)** Unit 7 **Identify: angles at a point and one whole turn (total 360°) angles at a point on a straight line and 2 1 a turn (total 180°) other multiples of 90°** Unit 7	*Pupils continue to apply their understanding in comparing and measuring angles in degrees when constructing 2-D shapes and classifying polygons* Unit 8

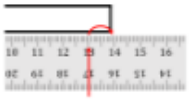
Measures: Overview

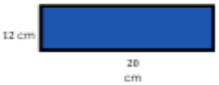
I think the tray is going to be 30 centimetres long because it looks just over double the length of the book, and the book is 13 centimetres long.

Concepts: Compare, measure and calculate, Converting measures Time, Money,

The ___ is heavier than the ____.







Reception

- Use everyday language to compare length, mass/weight and capacity.

Year 1

- Compare, describe, measure, record and solve practical problems for: lengths and heights; mass/weight; capacity and volume; time
- Sequence events in chronological order using language
- Recognise and use language relating to dates, including days of the week, weeks, months and years
- Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times
- Recognise and know the value of different denominations of coins and notes

Year 2

- Choose and use appropriate standard units to estimate and measure length/height; mass; temperature; capacity
- Compare and order lengths, mass, volume/capacity and record the results using >, < and =
- Compare and sequence intervals of time
- Tell and write the time to five minutes
- Know the number of minutes in an hour and the number of hours in a day
- Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- Find different combinations of coins that equal the same amounts of money
- Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change

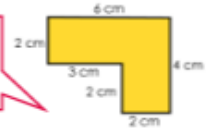
Year 3

- Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)
- Measure the perimeter of simple 2-D shapes
- Tell and write the time from an analogue clock, including using Roman numerals and 12/24hr clocks
- Estimate and read time with increasing accuracy to the nearest minute;
- Know the number of seconds in a minute and the number of days in each month, year and leap year
- Compare durations of events
- Add and subtract amounts of money to give change

Miles	Kilometres
0	0
5	8
10	16
	24
20	32

$1\text{ cm} \times 2\text{ cm} \times 1\text{ cm} = 2\text{ cm}^3$

Area is a measure of something two-dimensional; the amount of surface taken up by a two-dimensional shape



Perimeter is a measure of length which is a measure of something one-dimensional.

Year 4

- Measure and calculate the perimeter of a rectilinear figure in cm/m (including squares)
- Find the area of rectilinear shapes by counting squares
- Estimate, compare and calculate different measures, including money in pounds and pence
- Solve problems involving converting from hours to minutes, minutes to seconds, years to months, weeks to days
- Convert between different units of measure
- Read, write and convert time between analogue and digital 12- and 24-hour clocks

Year 5

- Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres
- Calculate and compare the area of rectangles (including squares), including using standard units, cm^2 and m^2, and estimate the area of irregular shapes
- Estimate volume and capacity
- Use all four operations to solve problems involving measure
- Solve problems involving converting between units of time
- Convert between different units of metric measure
- Understand and use approximate equivalences between metric units and common imperial units

Year 6

- Solve problems involving the calculation and conversion of units of measure (up to 3dp)
- Recognise that shapes with the same areas can have different perimeters and vice versa
- Recognise when it is possible to use formulae for area and volume of shapes
- Calculate the area of parallelograms and triangles
- Calculate, estimate and compare volume of cubes and cuboids using standard units (cm^3 m^3), and extending to other units (e.g. mm^3 km^3)
- Use, read, write and convert between standard units (up to 3dp)
- Convert between miles and kilometres

Measures: Concept breakdown

Note: Statutory Curriculum requirements are in **bold**

	Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
Compare, measure and calculate (length and area; mass/weight; volume and capacity; temperature)							
Estimate, compare and describe measures	*Use everyday language to compare length, mass/weight and capacity.* Unit 5 Unit 18	**Compare, describe and solve practical problems for:** • **Lengths and heights** • **Mass/weight** • **Capacity/volume** Unit 11 Unit 16	**Compare and order lengths, mass, volume/capacity and record the results using >,< and =** Unit 4 (length) Unit 13 (capacity) Unit 14 (mass)	**Compare lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)** *Pupils estimate units of measure* Unit 11	**Estimate, compare and calculate different measures, including money in pounds and pence** Unit 10	**Estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water]** Unit 13	**Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³]** Unit 6
Measure and read scales		**Measure and begin to record the following:** • **Lengths and heights** • **Mass/weight** • **Capacity/volume** *Pupils initially use non-standard units e.g. hands and progress to explore the concepts of 1 meter and 1 kilogram* Unit 11 Unit 16	**Choose and use appropriate standard units to estimate and measure:** • **length/height in any direction (m/cm);** • **mass (kg/g);** • **temperature (°C);** • **capacity (litres/ml)** **to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels** Unit 4 (length) Unit 13 (capacity) Unit 14 (mass)	**Measure, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/ capacity (l/ml)** *Pupils develop confidence in estimating measures in standard units and begin to use mixed measures e.g. 1 kg and 200g* Unit 5 Unit 11	Continue to choose appropriate units of measurement, read scales and calculate with measure in Maths Meetings	Continue to choose appropriate units of measurement, read scales and calculate with measure in Maths Meetings	
Measure and calculate: Perimeter and area				**Measure the perimeter of simple 2-D shapes** Unit 5	**Measure and calculate the perimeter of a rectilinear figure in cm/m (including squares)** **Find the area of rectilinear shapes by counting squares** *Pupils begin to explore calculting the areas of rectangles in preparation for Year 4.* Unit 9	**Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres** **Calculate and compare the area of rectangles (including squares), including using standard units, square centimetres (cm²) and square metres (m²), and estimate the area of irregular shapes** Unit 5	**Recognise that shapes with the same areas can have different perimeters and vice versa** **Recognise when it is possible to use formulae for area and volume of shapes** **Calculate the area of parallelograms and triangles** Unit 6

Measures: Concept breakdown

Note: Statutory Curriculum requirements are in **bold**

	Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
Compare measure and calculate (length and area; mass/weight; volume and capacity; temperature)							
Applying to problems in context			**Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change** *Pupils solve word problems that involve length capacity and volume* Unit 4 (length) Unit 10 (money) Unit 13 (capacity and volume) Unit 14 (mass)	*Pupils solve addition, subtraction, multiplication and division problems in context* Unit 11	*Pupils apply knowledge of units of measure to plan and solve problems in context* Unit 10	**Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling** Unit 11	**Solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate** Unit 6
Converting							
Converting metric units		*Whilst exploring measures throughout KS1 and Year 3 pupils should become familiar with simple equivalents, e.g. 1 m = 100cm, 1 kg = 1000kg etc to prepare them for conversion problems in Year 4.*			**Convert between different units of measure [for example, kilometre to metre; hour to minute]** Unit 10	**Convert between different units of metric measure** **Understand and use approximate equivalences between metric units and common imperial units** Unit 10	**Convert between miles and kilometres** **Solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate** Unit 6
Converting units of time			**Know the number of minutes in an hour and the number of hours in a day** Unit 7	**Know the number of seconds in a minute and the number of days in each month, year and leap year** Unit 8	**Solve problems involving converting from hours to minutes, minutes to seconds, years to months, weeks to days** Unit 7	**Solve problems involving converting between units of time** Unit 10	See above.

Measures: Concept breakdown

Note: Statutory Curriculum requirements are in **bold**

	Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
Time							
Describe and calculate the passage of time		**Sequence events in chronological order using language** **Recognise and use language relating to dates, including days of the week, weeks, months and years** Unit 6	**Compare and sequence intervals of time** Unit 7	**Compare durations of events [for example, to calculate the time taken by particular events or tasks]** Unit 8	*Pupils should continue to compare durations of events in Maths Meetings*		
Telling the time		**Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times** Unit 6	**tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times** Unit 7	**Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, am/pm, morning, afternoon, noon and midnight** Unit 8 Pupils use both *analogue and digital 12-hour clocks and record their times.* Unit 8	**Read, write and convert time between analogue and digital 12- and 24-hour clocks** Unit 7	*Pupils should continue to practise reading the time and converting between 12- and 24-hour clocks in their Maths Meetings*	
Understanding equivalent measures of time			**Know the number of minutes in an hour and the number of hours in a day** Unit 7	**Know the number of seconds in a minute and the number of days in each month, year and leap year** Unit 8	**Solve problems involving converting from hours to minutes, minutes to seconds, years to months, weeks to days** Unit 7	**Solve problems involving converting between units of time** Unit 10	*Pupils should continue to convert between units of time in Maths Meetings*

Measures: Concept breakdown

Note: Statutory Curriculum requirements are in **bold**

	Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
	Money						
Recognise coins and notes	*Pupils begin to familiar with coins and should explore using them in context through play e.g. class shop* Unit 17	**Recognise and know the value of different denominations of coins and notes** Unit 14	**Recognise and use symbols for pounds (£) and pence (p)** Unit 10	*Pupils consolidate KS1 objectives in Maths Meetings, focusing on represent a given amount of money in different ways in Year 3 and relating to knowledge of decimals in Year 4.*			
Calculate using money		*Pupils become familiar with adding and subtracting amounts of money* Unit 14	**Find different combinations of coins that equal the same amounts of money** Unit 10 **Combine amounts to make a particular value** Unit 10 **Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change** Unit 10	**Add and subtract amounts of money to give change, using both £ and p in practical** Unit 1	**Estimate, compare and calculate different measures, including money in pounds and pence** Unit 10	*Pupils continue to reason, calculate and solve problems in the context of money* Unit 14	*Pupils solve problems involving money and units of measure* Unit 6

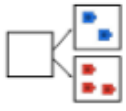
Algebra: Overview

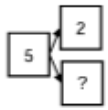
Concepts: Patterns and sequences, Reasoning about relations between quantities, Solving problems with unknown values, Representing relationships with formulae

Statements for Algebra **only appear in the Year 6 National Curriculum** but should be connected to previous learning on understanding equivalence, patterns and sequences, solving problems with unknown value and representing relationships as formulae. These connections from the other curriculum strands have been mapped in Reception-Year 5 in this document.

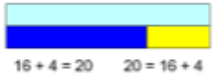
Please note: this list is not exhaustive and algebraic thinking can be applied throughout the mathematics curriculum, see this NRICH article for further reading.

Two cubes add three cubes is equal to five cubes.





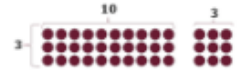
2 + ▲ = 5



16 + 4 = 20 | 20 = 16 + 4
4 + 16 = 20 | 20 = 4 + 16
20 – 16 = 4 | 4 = 20 -16
20 – 4 = 16 | 16 = 20 - 4

315 = 254 + ☐

315	
254	?



13 x 3 = 39.
I know 10 x 3 = 30 and 3 x 3 = 9. So 30 + 9 = 39

Reception

- Continue, copy and create repeating patterns
- Pupils compare numbers and objects using the language of more than', 'less than', 'fewer', 'the same as', 'equal to'.

Year 1

- Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least
- Read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs
- Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? − 9

Year 2

- Order and arrange combinations of mathematical objects in patterns
- Show that addition & multiplication of 2 numbers can be done in any order (commutative) and subtraction & division of 1 number from another cannot
- Add 3 one-digit numbers, *using associativity* (e.g. (3+4) + 2 = (2+4) + 3
- Compare and order numbers from 0 up to 100; use <, > and = signs
- Pupils should partition numbers in different ways (e.g. 23 = 20 + 3 and 23 = 10 + 13) to support subtraction.
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems

Year 3

- Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction
- Solve problems, including missing number problems, involving multiplication and division, including using the distributive law, positive integer scaling problems and correspondence problems in which n objects are connected to m objects

$x = 45y + 125$

The cost of a photo album book is £1.25 for binding and printing with an additional cost of 45p per photo

How many cubes will be in the next staircase?
How many cubes will be in the tenth staircase?

Year 4

- Solve problems involving patterns
- Estimate and use inverse operations to check answers to a calculation
- Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects
- Express perimeter algebraically as 2(a + b) where a and b are the dimensions in the same unit.

Year 5

- Use and explain the equals sign to indicate equivalence, including in missing number problems (for example 13 + 24 = 12 + 25; 33 = 5 x ?).
- Use the properties of rectangles to deduce related facts and find missing lengths and angles
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- Distributivity can be expressed as a(b + c) = ab + ac

Year 6

- Generate and describe linear number sequences
- Express missing number problems algebraically
- Find pairs of numbers that satisfy an equation with 2 unknowns
- Enumerate possibilities of combinations of 2 variables
- Solve problems involving the relative sizes of 2 quantities where missing values can be found by using integer multiplication and division facts
- Find missing angles
- Use simple formulae and recognise when it is possible to use formulae for area and volume of shapes and translating vertices

7 12 17 22 27 32 37

"the (term-to-term) rule is **add five**"

2 x (8 + 7) = 30.
The perimeter is 30 metres

Algebra: Concept breakdown

Note: Statutory Curriculum requirements are in **bold**

	Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
Pattern and sequences							
Describing pattern	*Continue, copy and create repeating patterns* Unit 2	*Recognise and create repeating patterns* Unit 3	**Order and arrange combinations of mathematical objects in patterns and sequences** Unit 11	*Pupils should continue to consolidate describing and creating patterns Maths Meetings*	*Solve problems involving patterns* Unit 13	*Pupils continue to explore patterns in Maths Meetings*	**Generate and describe linear number sequences** Unit 3
Reasoning about relations between quantities							
Reasoning about relations between quantities	*Identify equal and unequal sets* Unit 1; Unit 10; Unit 11; Unit 15; Unit 16 *Compare numbers and objects using the language of more than', 'less than', 'fewer', 'the same as', 'equal to'* Unit 1; Unit 5; Unit 14; Unit 17;Unit 18	**Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least** Unit 1 ; Unit 4; Unit 8; Unit 12 **Read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs** Unit 2; Unit 5; Unit 7; Unit 9; Unit 13	**Compare and order numbers from 0 up to 100; use <, > and = signs** Unit 1; Unit 12 **Show that addition & multiplication of 2 numbers can be done in any order (commutative) and subtraction & division of 1 number from another cannot** Unit 2, Unit 6 **Add 3 one-digit numbers**, *using associativity* (e.g, (3+4) + 2 = (2+4) + 3 Unit 2 *Pupils should partition numbers in different ways (for example, 23 = 20 + 3 and 23 = 10 + 13) to support subtraction.* Unit 1	*Use larger numbers to at least 1000, applying partitioning related to place value using varied and increasingly complex problems, building on work in year 2 (for example, 146 = 100 + 40 and 6, 146 = 130 + 16).* Unit 2	**Estimate and use inverse operations to check answers to a calculation** Unit 2 *Pupils write statements about the equality of expressions (for example, use the distributive law 39 × 7 = 30 × 7 + 9 × 7 and associative law (2 × 3) × 4 = 2 × (3 × 4)). They combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations for example, 2 x 6 x 5 = 10 x 6 = 60.* Unit 3	**Use and explain the equals sign to indicate equivalence, including in missing number problems (for example 13 + 24 = 12 + 25; 33 = 5 x ?).** Arithmetic Autumn 2 **Use the properties of rectangles to deduce related facts and find missing lengths and angles** Unit 7	**Express missing number problems algebraically** Unit 3

Algebra: Concept breakdown

Note: Statutory Curriculum requirements are in **bold**

	Reception →	Year 1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
Solving problems with unknowns							
Solving problems with unknowns		**Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? – 9** Unit 2; Unit 5; Unit 7; Unit 9; Unit 13	**Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems** Unit 3 (Do Nows); Unit 15	**Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction** Unit 4; Unit 13 **Solve problems, including missing number problems, involving multiplication and division, including using the distributive law, positive integer scaling problems and correspondence problems in which n objects are connected to m objects** Unit 6	**Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why** Unit 2; Unit 10 **Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects** Unit 3	**Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.** Unit 2 **Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign** Unit 4	**Find pairs of numbers that satisfy an equation with 2 unknowns** Unit 3 **Numerate possibilities of combinations of 2 variables** Unit 3 **Solve problems involving the relative sizes of 2 quantities where missing values can be found by using integer multiplication and division facts** Unit 3
Representing relationships with formulae							
Representing relationships with formulae					*Express perimeter algebraically as 2(a + b) where a and b are the dimensions in the same unit.* Unit 9	*Distributivity can be expressed as a(b + c) = ab + ac* Unit 4	**Use simple formulae** Unit 3 **Find missing angles** Unit 7 **Recognise when it is possible to use formulae for area and volume of shapes** Unit 6 **and translating vertices** Unit 8

Statistics: Overview

Concepts: Present and interpret data, Solve problems

♫ Windy, rainy, sunny, cloudy – what's the weather today?

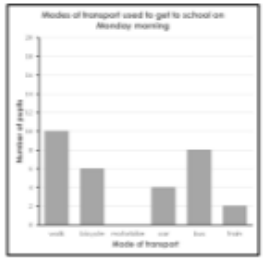
Which type of weather have we had the most?

Day	Number of ice lollies sold
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	
Sunday	

= 1 ice lolly

Were there more ice lollies sold on Saturday or Sunday?

There were more ice lollies sold on Saturday than Sunday.



What is the difference between the number of children who walked to school and got the train to school?

Reception and Year 1

- Use everyday routines and Maths Meeting time to begin to collect and discuss simple data e.g. recording the type of weather or pupils' birthdays.

Year 2

- Interpret and construct simple pictograms, tally charts, block diagrams and simple tables
- Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- Ask and answer questions about totalling and comparing categorical data

Year 3

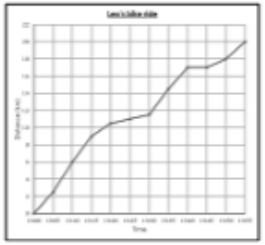
- Interpret and present data using bar charts, pictograms and tables
- Solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.

Approximately 40% of people own a dog.

Approximately a third of people own a cat.

	Trains from Swansea to Reading			
	Train A	Train B	Train C	Train D
Swansea	10:29	10:58	-	11:28
Cardiff	11:26	-	11:55	12:25
Bristol	12:03	12:30	12:32	13:01
Bath Spa	-	12:52	-	13:21
Swindon	-	13:09	13:07	-
Reading	13:42	13:58	13:56	14:26

Adam gets the fastest train from Cardiff to Bristol, which train does he get?



At what time did Leo stop for a rest?

Year 4

- Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.
- Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs

Year 5

- Complete, read and interpret information in tables, including timetables.
- Solve comparison, sum and difference problems using information presented in a line graph

Year 6

- Interpret and construct pie charts and line graphs and use these to solve problems
- Calculate and interpret the mean as an average

Statistics: Concept breakdown

Note: Statutory Curriculum requirements are in **bold**

Reception and Y1 →	Year 2 →	Year 3 →	Year 4 →	Year 5 →	Year 6
Presenting and interpreting data					
Whilst there are no statutory requirements for statistics in Reception and Year 1, pupils should begin to explore the collection and interpretation of data in their Maths Meetings and everyday routines. E.g. recording birthdays, school meals, types of weather.	**linterpret and construct simple pictograms, tally charts, block diagrams and simple tables** *Pupils should progress from using one-to-one correspondence to exploring examples with many-to-one correspondence with simple ratios: e.g. one object represents 2, 5 or 10*	**Interpret and present data using bar charts, pictograms and tables** *Pupils understand and use simple scales (for example, 2, 5, 10 units per cm) in pictograms and bar charts with increasing accuracy* Unit 3	**Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs** *Pupils understand and use a greater range of scales in their representations.* *Pupils begin to relate the graphical representation of data to recording change over time.* Unit 4	**Complete, read and interpret information in tables, including timetables.** *Pupils connect their work on coordinates and scales to their interpretation of time graphs* *Pupils begin to decide which representations of data are most appropriate and why* Unit 3	**Interpret and construct pie charts and line graphs and use these to solve problems** *Pupils both encounter and draw graphs relating two variables, arising from their own enquiry and in other subjects.* Unit 9
Solving problems					
In number and addition and subtraction units, pupils will be developing their confidence with comparative problems, (for example, who has the most/least, finding the difference) and this will prepare them for solving problems related to data in Year 2.	**Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity** **Ask and answer questions about totalling and comparing categorical data**	**Solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables** Unit 3	**Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs** Unit 4	**Solve comparison, sum and difference problems using information presented in a line graph** Unit 3	**Calculate and interpret the mean as an average** Unit 9

Programmes of Study

The **component knowledge** is broken down into **granular**, small steps of learning and is set out in a termly programme of study. Whilst these are set out in terms in the Mathematics Mastery programme, at Richmond Hill, we implement our curricula based on a cycle approach and ensure that all steps of learning are taught before moving onto the next, regardless of when in the academic year it is.

These programmes of study should be viewed alongside our **Mathematics Mastery Vocabulary List.**

Curriculum Maps for each year group

Reception

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11
Autumn	**Early mathematical experiences**				**Pattern and early number**		**Numbers within 6**		**Addition and subtraction within 6**	**Measures**	**Shape and sorting**
	• Classifying objects based on one attribute • Matching equal and unequal sets • Comparing objects and sets • Ordering objects and sets				• Recognise, describe, copy and extend colour and size patterns • Count and represent the numbers 1 to 3 • Estimate and check by counting		• Count up to six objects. • One more or one fewer • Order numbers 1 – 6 • Conservation of numbers within six		• Explore zero • Explore addition and subtraction	• Estimate, order compare, discuss and explore capacity, weight and lengths	• Describe, and sort 3-D shapes • Describe position accurately

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 8	Week 9
Spring	**Numbers within 10**		**Calendar and time**	**Addition and subtraction within 10**	**Grouping and sharing**		**Number patterns within 15**		**Doubling and halving**	**Shape and pattern**
	• Count up to ten objects • Represent, order and explore numbers to ten • One more or fewer, one greater or less		• Days of the week, seasons • Sequence daily events	• Explore addition as counting on and subtraction as taking away	• Counting and sharing in equal groups • Grouping into fives and tens • Relationship between grouping and sharing		• Count up to 15 objects and recognise different representations • Order and explore number patterns to 15 • One more or fewer		• Doubling and halving • Relationship between doubling and halving	• Describe and sort 2-D and 3-D shapes • Recognise, complete and create patterns

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Summer	**Securing addition and subtraction facts**		**Number patterns within 20**		**Number patterns beyond 20**	**Money**	**Measures**		**Exploration of patterns within number**	
	• Commutativity • Explore addition and subtraction • Compare two amounts		• Count up to 10 and beyond with objects • Represent, compare and explore numbers to 20 • One more or fewer		• One more one less • Estimate and count • Grouping and sharing	• Coin recognition and values • Combinations to total 20p • Change from 10p	• Describe capacities • Compare volumes • Compare weights • Estimate, compare and order lengths		• Explore numbers and strategies • Recognise and extend patterns • Apply number, shape and measures knowledge • Count forwards and backwards	

Autumn	**1. Early mathematical experiences** **(3-4 weeks)**	• match equal sets using one-to-one correspondence • match unequal sets using one-to-one correspondence • compare objects according to size • compare sets without counting • order objects according to length or height • order sets without counting
	2. Pattern and early number **(2 weeks)**	• recognise, create and describe patterns • describe and create patterns that are the same and different • count 1, 2 or 3 objects reliably • recognise if a number of objects is the same or different (working with numbers 1, 2 and 3) • count one, two or three objects, images or sounds reliably • recognise the numerals 1, 2 and 3 • create representations for numbers 1, 2 and 3
	3. Numbers within 6 **(2 weeks)**	• say which number is one more or one less than a given number • estimate a number of objects and check by counting • count reliably with numbers from 1 to 6 • Create representations for numbers 1- 6 • place numbers 1-6 in order • say which number from 1-6 is one more or one less than a given number • recognise the numerals 1-6 • understand the conservation of number
	4. Addition and subtraction within 6 **(1 week)**	• add and subtract two single-digit numbers • estimate a number of objects and check by counting up to 6 • introduce the concept of 0 as the empty set • subitise within 5 • represent and use number bonds within 5 • use quantities and objects to add and subtract two single-digit numbers
	5. Measures **(1 week)**	• use everyday language to talk about size, weight, capacity • estimate, measure, weigh and compare and order objects • compare objects and quantities • solve size problems related to measures
	6. Shape and sorting **(1 week)**	• explore characteristics of everyday objects and shapes and use mathematical language to describe them • shows an interest in shape and space by playing with shapes by sustained construction activity • explore characteristics of everyday objects and shapes (focusing on 3-D shapes) • use positional language • use mathematical language associated with shape • classify and sort everyday objects

Spring	**7. Numbers within 10** **(2 weeks)**	• say which number is one more or one less than a given number • estimate a number of objects and check by counting • count reliably with numbers from 1 to 10 • develop an understanding of zero • create representations for numbers 0-10 • place numbers 0-10 in order • recognise the numerals 0-10 • use ordinal numbers: 1st, 2nd...last • understand the conservation of numbers
	8. Calendar and time **(1 week)**	• use everyday language to talk about time, days of the week and months of the year • measures short periods of time in simple ways • orders and sequences familiar events • use ordinal numbers: 1st, 2nd...last
	9. Addition and subtraction within 10 **(1 week)**	• estimate a number of objects and check by counting up to 10 • add and subtract two single-digit numbers and count on or back to find the answer • use quantities and objects to add and subtract two single-digit numbers
	10. Grouping and sharing **(2 weeks)**	• solve practical problems that involve combining groups of 2, 5 or 10, or sharing into equal groups • solve practical problems that involve grouping and sharing • explore counting on in steps of 2 from zero
	11. Number patterns within 15 **(2 weeks)**	• say which number is one more or one less than a given number • estimate a number of objects and check by counting • count reliably with numbers from 0 to 15 • Create representations for numbers 0-15 • place numbers from 0-15 in order • considering equal and unequal groups
	12. Doubling and halving **(1 week)**	• solve problems, including doubling, halving and sharing • Explore the relationship between doubling and halving
	13. Shape and pattern **(1 week)**	• talk about properties of shapes • explore characteristics of everyday objects and shapes and use mathematical language to describe them • explore characteristics of everyday objects and shapes (focusing on 2-D shapes) • use mathematical language associated with shape • classify and sort shapes • recognise, create and describe patterns with shapes • use mathematical language to describe size and position

Summer	**14. Securing addition and subtraction facts (2 weeks)**	• estimate a number of objects and check by counting up to 20 • add and subtract two single-digit numbers and count on or back to find the answer • explore the relationship between addition and subtraction • compare quantities and objects to solve problems • solve problems, including doubling, halving and sharing • say which number is one more or one less than a given number • use quantities and objects to add and subtract two single-digit numbers
	15. Number patterns within 20 (2 weeks)	• count reliably with numbers from one to 20 • place numbers from 0-20 in order • say which number is one more or one less than a given number • solve practical problems that involve grouping and sharing • Create representations for numbers 0-20 • estimate a number of objects and check by counting, considering equal and unequal groups
	16. Number patterns beyond 20 (1 week)	• say which number is one more or one less than a given number • solve problems including grouping and sharing • estimate a number of objects and check by counting • count reliably to 50 • explore counting on and back from any number within 50 • place numbers from 0-50 in order • estimate a number of objects and check by counting • solve practical problems that involve combining groups of 2, 5 or 10, or sharing into equal groups
	17. Money (1 week)	• compare quantities and objects to solve problems • use everyday language to talk about money, recognise coins up to 50p and their values • compare the value of coins • use quantities and objects to count on and back to add and subtract
	18. Measures (2 weeks)	• use everyday language to talk about size, weight, capacity • estimate, measure, weigh and compare and order objects • compare objects and quantities • solve size problems involving measures • explore measuring objects using non-standard units
	19. Exploration of patterns within number (2 weeks)	• solve problems including grouping, sharing, doubling and halving • Records using marks that they can interpret and explain • Begins to identify own mathematical problems based on own interests and fascinations

Cycle	Unit	Lesson	Granular Knowledge
1	Early Mathematical Experiences	1	Sorting a collection of objects based on one attribute
		2	Sorting a collection of objects in difference ways
		3	Sorting concrete objects to form sets
		4	Sorting pictures to form a set
		5	**Consolidation and Review**
		6	Sorting shapes based on name or colour
		7	Matching pairs of identical objects
		8	Matching pairs of related objects
		9	Matching objects into equal sets
		10	**Consolidation and Review**
		11	Matching objects into unequal sets
		12	Comparing sets without counting
		13	Comparing similar objects by size
		14	Comparing similar objects that are equal in size
		15	**Consolidation and Review**
		16	Ordering objects according to size
		17	Ordering sets without counting
		18	**Consolidation and Review**
		19	**Consolidation and Review**
		20	**Consolidation and Review**

2	Pattern and early number **Key Vocabulary** Pattern, colour, size, big, small, long, short, next, before, extend, colour, size, big, small, long, short, next, before	1	To recognise, describe and copy colour and size pa erns
		2	To recognise, describe, copy and extend colour and size pa erns
		3	To create and describe colour and size patterns
		4	To create colour or size patterns
		5	To count one and two objects reliably
		6	To count one, two and tree objects reliably
		7	Count one, two and three reliably using abstract materials
		8	Count one, two and three reliably Estimate a number of objects and check by counting
		9	To count one, two and three objects reliably and create representations for each number
		10	**Consolidation and Review**
3	Numbers within 6 **Key Vocabulary** One, two, three, four, same, different, five, six, more, fewer, first , next, before, after, greater, less	1	Count four objects reliably
		2	Develop understanding about the number four
		3	To count five objects reliably
		4	To count up to six objects reliably
		5	explore conservation of numbers within 6
		6	Explore one more within six
		7	Explore one fewer within six
		8	Place numbers 1-6 in order
		9	Developing conservation of number within six
		10	**Consolidation and Review**
4	Addition and subtraction within 6 **Key Vocabulary** Zero nothing, none, part whole, plus, altogether, is equal to, subtract, minus,	1	Explore the concept of zero
		2	Combine two groups
		3	Combine two groups including zero
		4	Explore subtraction by partitioning
		5	Practise addition and subtraction
5	Measure **Key Vocabulary** Big, bigger, biggest, small, smaller, smallest, Full, empty, half full, Heavy, heavier, heaviest, light, lighter, lightest, balance, Long, longer, longest, short, shorter, shortest, same length	1	Order objects by size
		2	To use everyday language to talk about volume and capacity. To explore and compare the volumes and capacities or everyday objects.
		3	Use everyday language to talk about weight Estimate, compare and explore the weight of everyday objects
		4	Use everyday language to talk about size Estimate, compare and explore the length of everyday objects
		5	**Consolidation and Review**
6	Shape and sorting	1	Describe and sort 3-D shapes

	Key Vocabulary vertex, vertices, face, edge, Over, under, above, below, top, bottom, side, on, in, in front, behind, front, back, beside, next to, between	2	Explore the characteristics of 3-D shape
		3	use mathematical language to describe position
		4	use mathematical language to describe position accurately
		5	**Consolidation and Review**
7	Numbers within 10 **Key Vocabulary** One, two, three, four, five, six, seven, same, different, eight, altogether, nine, ten, one more, one greater, one fewer, one less, Numbers names 1-10, order, greater, greatest, more, less, increasing, decreasing, First, second, third, fourth, fifth, sixth, seventh, eighth, ninth, tenth, last, next, before, after, between	1	To be able to count up to seven objects reliably To be able to recognise numbers (within seven) in different representations
		2	To be able to count up to eight objects reliably To be able to recognise numbers (within eight) in different representations
		3	To understand the conservation of number To be able to recognise numbers (within eight) in different representations
		4	To be able to count up to nine objects reliably
		5	To be able to count up to ten objects reliably
		6	To explore one more and one greater within ten
		7	To explore one fewer and one less within ten
		8	To place numbers within ten in order
		9	To apply knowledge of numbers to ten to solve mathematical problems
		10	To use key vocabulary associated with ordinal numbers 1st to 10th
8	Calendar and Time **Key Vocabulary** Time, season, month, day, calendar, week, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday, First, next, last, before, after, morning, afternoon, evening, night-time , longer, shorter	1	Explore and discuss time and the seasons
		2	Explore and discuss the days of the week and daily events
		3	use everyday language to talk about and sequence daily events
		4	use ordinal language when sequencing events and measure short periods of time in simple ways
		5	**Consolidation and Review**
9	Addition and subtraction within 10 **Key Vocabulary**	1	use manipulatives to count on when adding.
		2	add two numbers using a number track to count on. F

	First, then, now, plus, is equal to, take-away, plus	3	understand the concept of subtraction as take away.
		4	understand the concept of subtraction as take away.
		5	add and subtract using a number track.
10	Grouping and sharing **Key Vocabulary** groups of, each group, altogether, same, different, number, equal groups, pair, bead string, same number, 0, 10, 20, 30, 40, 50, share, equal, unequal, same number, how many?	1	understand the concept of equal groups
		2	practise counting in equal groups and adding them together
		3	explore counting in groups of two to find the total
		4	explore grouping objects in tens to find the total
		5	explore counting in groups of five
		6	explore sharing objects into two equal groups
		7	explore sharing objects into equal groups
		8	explore sharing quantities into equal groups
		9	recognise the connection between sharing and grouping and solve practical problems.
		10	**Consolidation and Review**
11	Number patterns within 15 **Key Vocabulary** number, number names 0 to 15, order, more, fewer, greater, less, same, equal, number line, one more, greater, less, fewer, between, before, after, bead string, number line, guess, check, ordinal, 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, first, last, order, sequence, groups of	1	to count up to 15 objects and place them in order
		2	to count up to 15 objects and place them in order
		3	to count up to 15 and place numbers in order
		4	know what is one more than a number within 15
		5	To know what is one fewer than a number within 15
		6	To apply knowledge of one more and one fewer
		7	To apply knowledge of one more and one less
		8	To use the guess and check strategy for problem solving
		9	To be able to order numbers within 15 To explore numbers within 15
		10	**Consolidation and Review**
12	Doubling and halving **Key Vocabulary**	1	To explore the concept of doubles

	Double, altogether, how many, count, Half, equal, altogether, how many, count, part whole model,	2	To explore the concept of half
		3	To explore the relationship between double and half
		4	To explore the relationship between double and half
		5	**Consolidation and Review**
13	Shapes and patterns **Key Vocabulary** side, edge, vertex, vertices, curved, straight, sort, criteria, corner, square, circle, triangle, rectangle, pattern, next, same, different	1	to sort 2-D shapes on the basis of one and two criteria
		2	To use 2-D shapes to recognise, continue and create patterns
		3	to describe and sort 3-D shapes on the basis of one and two criteria
		4	recognise, complete and create patterns using 3-D shapes
		5	recognise, complete and create patterns using 3-D shapes
14	Securing addition and subtraction facts **Key Vocabulary** Part, whole, plus, altogether, is equal to, First, then, now, plus, Subtract, minus, take away, More, fewer, greater than, less than, is equal to, compare, Double, two equal parts, part, whole	1	combine two quantities to find the total
		2	explore addition by adding on
		3	explore subtraction as partitioning
		4	explore subtraction as take away
		5	compare two sets of objects using ‘more’ or ‘fewer’
		6	compare quantities using more or fewer
		7	explore the concept of doubles

		8	find half of numbers to 10 and relate this to doubling.
		9	**Consolidation and Review**
		10	**Consolidation and Review**
15	Number patterns within 20 **Key Vocabulary** Number names 0–20, more, fewer, order, one group of ten, pattern, one more, one greater, between, before, after, 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, first, last, order	1	to count up to 20 objects and place them in order
		2	to count up to 20 and place numbers within 20 in order
		3	understand conservation of numbers within 20
		4	to find one more and one greater than a number within 20
		5	to find one fewer and one less than a number within 20
		6	apply knowledge of one more, one fewer, one greater and one less
		7	To apply knowledge of one more, one fewer, one greater and one less
		8	To investigate number combinations within 20
		9	To explore ordinal numbers and consolidate patterns
		10	**Consolidation and Review**
16	Number patterns beyond 20 **Key vocabulary** twenty, thirty, forty, count on, fifty, one more than, one fewer/less than, estimate, greater than, Share, equal, unequal, more than,	1	To recognise numbers to 40; to count to 40
		2	To recognise numbers to 50; to count to 50
		3	To identify one more and one less than a given number beyond 20
		4	To estimate quantities beyond 20 and check by counting
		5	To explore sharing quantities in different ways
17	Money **Key vocabulary** 1p, 2p, 5p, 10p, 20p, 50p, £1, coins, more, less, money, pence, penny, pennies, how much, altogether, pound, how much?	1	recognise the value of one penny and to recognise the value of coins
		2	explore different combinations of coins for a given total up to 10p.
		3	To explore different combinations of coins with a total of up to 20p
		4	To give change from ten pence
		5	To apply number sense within the context of money

18	Measures **Key vocabulary** full, nearly full, half full, empty, nearly empty, half empty, the same, heavy, heavier, heaviest, light, lighter, lightest, the same, weight, more, less, about, length, same, different, how long, longer, longest, short, shorter, shortest	1	describe the capacities of objects and use language about capacity
		2	compare the volume of liquid in different containers
		3	compare the weights of objects and use language about weight
		4	
		5	begin to estimate the lengths of objects and then compare and order lengths
		6	measure objects using non standard units and use language related to measure accurately
		7	
		8	**Consolidation and Review**
		9	**Consolidation and Review**
		10	**Consolidation and Review**
19	Exploration of patterns within number **Key vocabulary** One, two, first, second, Number names 0-15, group, share, equal, unequal, odd, even, Number names 0-10, add, subtract, plus, minus, double, exactly, shapes, size, big, small, round, tall, short, more, fewer	1	explore numbers, strategy and patterns within ten
		2	explore conservation of numbers
		3	apply knowledge of addition, subtraction and doubles
		4	apply knowledge of number, shape and measures in their surrounding environment
		5	practise counting forwards and backwards from a number
		6	To explore different ways of making ten
		7	To recognise and extend a pattern

Year 1

Autumn

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Numbers to 10		**Addition and subtraction within 10**		**Shape and patterns**		**Numbers to 20**		**Addition and subtraction within 20**	
• Represent, compare and explore numbers within 10 • One more and one less • Doubling and halving		• Represent and explain addition and subtraction • Commutativity • Addition and subtraction facts		• Identify, describe, sort and classify 2-D and 3-D shapes • Investigate repeating patterns • Use and follow instructional and positional language		• Identify, represent, compare and order numbers to 20 • Doubling and halving • One more and one less		• Represent and explain addition and subtraction strategies including 'Make Ten' • Use known facts to add and subtract	

Spring

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Time		**Exploring calculation strategies within 20**	**Numbers to 50**		**Addition and subtraction within 20**		**Fractions**	**Measures: Length and mass**	
• Read, write and tell the time to o'clock and half past on analogue clock • Sequencing daily activities • Whole and half turns linked to time		• Model, explain and choose addition and subtraction strategies	• 2-digit numbers – represent, sequence, explore, compare. • Count in 2s, 5s and 10s • Describe and complete number patterns		• Illustrate, explain and link addition and subtraction with equations • Apply 'Make Ten' strategy • Use language to quantify and compare difference		• Identify $\frac{1}{2}$ and $\frac{1}{4}$ of a shape or object • Find $\frac{1}{2}$ and $\frac{1}{4}$ of a quantity	• Compare and measure lengths and mass using cm and kg • Doubling and halving	

Summer

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11
Numbers 50 to 100 and beyond		**Addition and subtraction**		**Money**		**Multiplication and division**			**Measures: Capacity and volume**	
• Read, write, represent, compare and order numbers to 100 • One more / fewer, ten more / fewer • Identify number patterns		• Explore addition and subtraction involving 2-digit numbers and ones • Represent and explain addition and subtraction with regrouping • Investigate number bonds within 20		• Name coins and notes and understand their value • Represent the same value using different coins • Find change		• Explore arrays • Share equally into groups • Doubling • Link halving to fractions			• Compare capacities, volumes and lengths • Explore litres • Apply understanding of fractions to capacity	

Autumn	**1. Numbers to 10** **(2 weeks)**	• count to and across [10], forwards and backwards, beginning with 0 or 1, or from any given number • count, read and write numbers [to 10] in numerals and words • identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • given a number, identify one more and one less • represent and use number bonds and related subtraction facts [within 10] • count in multiples of two *(during Do Nows and transitions)*
	2. Addition and subtraction within 10 (Combination and partitioning) **(2 weeks)**	• represent and use number bonds and related subtraction facts [within 10] • add and subtract one-digit numbers [to 10], including zero • read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems • show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot (Y2 objective)
	3. Shapes and patterns **(2 weeks)**	• recognise and name common 2-D and 3-D shapes, including: 2-D shapes [for example, rectangles (including squares), circles and triangles]; 3-D shapes [for example, cuboids (including cubes), pyramids and spheres] • describe position, direction and movement, including quarter turns
	4. Numbers to 20 **(2 weeks)**	• count to and across [20], forwards and backwards, beginning with 0 or 1, or from any given number • read and write numbers from 1 to 20 in numerals and words • identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • count in multiples of two and five *(during Do Nows and transitions)*
	5. Addition and subtraction within 20 **(Augmentation and reduction)** **(2 weeks)**	• represent and use number bonds and related subtraction facts within 20 • add and subtract one-digit and two-digit numbers to 20, including zero • read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ☐ – 9

Spring	**6. Time** **(2 weeks)**	• tell the time to the hour and half past the hour and draw the hands on a clock face to show these times • recognise and use language relating to dates, including days of the week, weeks, months and years • compare, describe and solve practical problems for time [for example, quicker, slower, earlier, later] and measure and begin to record time (hours, minutes, seconds • sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] • measure and begin to record the following: time • describe position, direction and movement, including whole, half, quarter and three-quarter turns, with reference to the clock face
	7. Exploring calculation strategies within 20 **(1 week)**	• represent and use number bonds and related subtraction facts within 20 • add and subtract one-digit and two-digit numbers to 20, including zero • read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ☐ – 9
	8. Numbers to 50 **(2 weeks)**	• count to and across fifty, forwards and backwards, beginning with 0 or 1, or from any given number; count in multiples of two, five and ten. • read and write numbers from 1 to 20 in numerals and words • identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • given a number, identify one more and one less • count in multiples of two, five and ten • pupils begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100, supported by objects and pictorial representations (non-statutory guidance)
	9. Addition and subtraction within 20 **(Comparison and difference)** **(2 weeks)**	• represent and use number bonds and related subtraction facts within 20 • add and subtract one-digit and two-digit numbers to 20, including zero • read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ☐ – 9
	10. Fractions (1 week)	• recognise, find and name a half as one of two equal parts of an object, shape or quantity • recognise, find and name a quarter as one of four equal parts of an object, shape or quantity
	11. Measures (1): Length and mass **(2 weeks)**	• compare, describe and solve practical problems for: lengths and heights [for example, long/short, longer/shorter, tall/short, double/half]; mass/weight [for example, heavy/light, heavier than, lighter than] • measure and begin to record the following: lengths and heights; mass/weight

Summer	**12. Numbers 50 to 100 and beyond** **(2 weeks)**	• count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number; count on and back in two, five and ten. • read and write numbers from 1 to 20 in numerals and words; read and write numbers to at least 100 in numerals (Y2 objective) • given a number, identify one more and one less • identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • pupils begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100, supported by objects and pictorial representations (non-statutory guidance)
	13. Addition and subtraction **(Applying strategies and structures)** **(2 weeks)**	• represent and use number bonds and related subtraction facts within 20 • add and subtract one-digit and two-digit numbers, including zero • add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers; adding three one-digit numbers (Y2 objective) • read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ☐ – 9
	14. Money **(2 weeks)**	• recognise and know the value of different denominations of coins and notes • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ☐ – 9
	15. Multiplication and division **(2 weeks)**	• solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher • count in multiples of twos, fives and tens • recognise, find and name a half as one of two equal parts of a quantity • recognise, find and name a quarter as one of four equal parts of a quantity
	16. Measures (2): Capacity and volume (2 weeks)	• compare, describe and solve practical problems for: lengths and heights [for example, long/short, longer/shorter, tall/short, double/half]; mass/weight [for example, heavy/light, heavier than, lighter than]; capacity and volume [for example, full/empty, more than, less than, half, half full, quarter] • measure and begin to record the following: lengths and heights; mass/weight; capacity and volume

Cycle	Unit	Lesson	Granular Knowledge
1	Numbers within 10 **Key Vocabulary** Number, zero, one, teo, three, four, five, six, seven, eight, nine, ten, as many, the same, more, fewer, the same value, part, number bond, whole, represent, double, half, halve, equal, inverse, one more, one les, difference, compare, order, less, greater, least,	1	Count sets of objects within ten
		2	Represent numbers within ten
		3	Recognise number bonds to five and six
		4	Recognise number bonds to seven and eight
		5	Recognise number bonds to nine and ten
		6	Find double an amount up to five
		7	Find half an amount within ten
		8	Find one more and one less
		9	Compare and order two or more numbers within ten
		10	**Consolidation and review**
2	Add and subtract within 10 (combining and partitioning) **Key Vocabulary** Equation, plus, add, part, addition, is equal to, symbol, sign, addition, count on, altogether, efficient, minus, subtract, partition, number line, count back, add, plus, minus, subtract, total,	1	Combine two sets to find out how many altogether (counting all)
		2	Combine two sets to find out hoe many altogether (counting on)
		3	understand how equations can link to stories
		4	explore how to count on efficiently
		5	understand that partitioning can be written as a subtraction
		6	subtract by counting back in ones
		7	understand how equations can link to stories
		8	explore related addition and subtraction facts
		9	solve a problem using addition and subtraction
		10	**Consolidation and review**
3	Shapes and patterns **Key Vocabulary** Face, surface, edge, straight, sphere, cone, vertex, curved, cone, cylinder, vertices, flat, pyramid, cube, square, rectangle, circle, oblong, triangle, pattern, after, repeating	1	recognise, name and describe 3-D shapes
		2	describe and classify 3-D shapes
		3	identify 2-D shapes
		4	describe and sort 2-D shapes
		5	recognise and create repeating patterns
		6	recognise and describe repeating patterns
		7	use the language of position
		8	use the language of position, direction and movement
		9	use the language of position, direction and movement
		10	**Consolidation and review**

	pattern, next, before, bigger, smaller, between, last, next to, on top of, under, behind, left, right, above, in front, forwards, quarter turn, algorithm,		
4	Numbers to 20 **Key Vocabulary** Eleven, twelve, thirteen, fourteen, fifteen, sixteen, seventeen, eighteen, nineteen, twenty, represent, count on, number line, more than, after, less than, order, before, one more, one less, ten, ones, difference, greater, fewer, compare, value, increase, decrease, pattern.	1	count from one to 19 and match concrete, pictorial and abstract representations of these numbers
		2	identify numbers to 20 by counting ten and then counting on
		3	position numbers to 20 on a number line
		4	identify one more and one less than a number within 20
		5	use concrete representations to compare numbers 11 to 20
		6	compare and order three or more numbers within 20
		7	identify and continue number patterns, adding and subtracting one and two
		8	find double any number to ten and half of any even number within 20
		9	understand even and odd as ‘fair’ and ‘unfair’ numbers
		10	**Consolidation and review**
5	Addition and subtraction within 20 (Augmentation and reduction) **Key Vocabulary** First, now, then, equation, represent, number track, more, add, number line, subtract, less, tae away, number bond, addition, known fact, is equal to, partition, make ten,	1	add by counting on using a number line or number track
		2	subtract by counting back using a number line or number track
		3	add a 1-digit number to a teen number using a known fact
		4	subtract a 1-digit number from a teen number using a known fact
		5	use the ‘Make ten’ strategy to add two 1-digit numbers
		6	use the ‘Make ten’ strategy to add two 1-digit numbers
		7	use the ‘Make ten’ strategy to subtract a 1-digit number from a teen number
		8	use the ‘Make ten’ strategy to subtract a 1-digit number from a teen number
		9	use mathematical models and strategies for addition and subtraction
		10	**Consolidation and review**
6	Time **Key Vocabulary**	1	know and order the months of the year
		2	sequence events in time order
		3	understand that time can be measured in minutes and seconds

	month year date after before birthday January February March April May June July August September October November December first before morning next afternoon then after evening second hour minute clock longer shorter minute hand second hand o'clock turn clockwise anti-clockwise whole half quarter	4	read and write the time to o'clock on an analogue clock
		5	read and write the time to half past on an analogue clock
		6	read the time to o'clock and half past on an analogue clock
		7	read and write o'clock and half past times in words
		8	explore adding on hours and half hours
		9	describe whole, half and quarter turns clockwise and anti-clockwise
		10	**Consolidation and review**
7	Exploring calculation strategies within 20 **Key Vocabulary** part whole known fact number bond related fact double number bond near double partition part whole 'Make ten' addition subtraction	1	use number bonds to derive subtraction facts and teens facts
		2	use doubles to calculate near doubles
		3	use a bead string to represent the 'Make ten' strategy
		4	understand that the = symbol represents equivalence
		5	choose an addition strategy based on the numbers in the calculation
8	Numbers to 50 **Key Vocabulary** less more order group of ten twenty forty pattern thirty fifty digit left right groups of ten place value ones part whole greater greatest less least compare between groups of two groups of five increasing decreasing	1	place the numbers from 20 to 50 in order and identify missing numbers
		2	recognise a group of ten as one unit
		3	begin to recognise tens and ones within 2-digit numbers
		4	understand how groups of ten and ones are written in a place value chart
		5	represent a 2-digit number within 50 as tens and ones on a place value chart
		6	compare and order numbers to 50 using place value
		7	compare and order numbers to 50 using a number line and a bead string
		8	practise and apply counting in twos and fives
		9	describe and complete number patterns
		10	**Consolidation and review**
9	Addition and subtraction within	1	Comparing two sets using the language 'more', 'fewer' and 'difference'

	20 (comparison and difference) **Key Vocabulary** fewer compare difference more greater than less than equation, subtract,	2	Comparing two sets and finding the difference in a range of contexts
		3	Exploring numbers with a difference of one and two on a number line
		4	Understanding two numbers using 'greater', 'less' and 'difference
		5	Using the 'Make ten' strategy to identify difference on a number line
		6	Writing subtraction equations to represent comparison situations
		7	Writing addition equations to represent comparison situations
		8	Interpreting and solving comparison problems using concrete manipulatives
		9	Consolidation and review
		10	**Consolidation and review**
10	Fractions **Key Vocabulary** part equal divide whole unequal half share quarter half three-quarter clockwise quarter turn whole anti-clockwise	1	identify one half of a shape or object
		2	find half of a quantity
		3	identify one quarter of a shape or object
		4	find one quarter of a quantity Lesson 5: Half and quarter turns
		5	To identify half, quarter and three quarter turns
11	Measures (1): Length and mass **Key Vocabulary** long longer length height longest short shorter shortest size compare measure measurement about nearly roughly close to metre stick metre half double mass balance balances estimate heavy heavier heaviest light lighter lightest	1	compare the lengths and heights of two or more objects
		2	measure lengths of objects using non-standard units
		3	measure lengths of objects using non-standard units
		4	experience standard units of length
		5	solve problems that involve doubling and halving lengths
		6	compare the masses of two objects
		7	compare the masses of more than two objects
		8	find the masses of objects using non-standard units
		9	find the masses of objects using non-standard units
		10	To find the masses of objects using non-standard units

12	Numbers 50-100 and beyond **Key Vocabulary** ten groups of ten count on tens twenty thirty ones forty fifty sixty seventy eighty ninety one hundred tens ones place value groups of ten Dienes place value place value chart one more one less one fewer ten more ten less ten fewer compare increase decrease pattern	1	count groups of ten and then count on in ones to identify 2-digit numbers
		2	represent numbers using Dienes on a place value chart
		3	represent the number 100 and understand that it is equal to ten groups of ten
		4	represent numbers within 100 as number bonds
		5	recognise one more and one fewer and ten more and ten fewer
		6	compare numbers within 100 on a number line
		7	compare numbers within 100 on a place value chart
		8	order numbers within 100
		9	identify the pattern in a sequence of numbers
		10	**Consolidation and review**
13	Addition and subtraction within 100 (applying strategies and structures) **Key Vocabulary** add part subtract whole tens ones number bonds Dienes subtract take away difference make ten regroup cost total value add subtract	1	apply knowledge of number bonds within 20
		2	add ones to a 2-digit number
		3	subtract ones from a 2-digit number
		4	add ones to a 2-digit number with regrouping
		5	subtract ones from a 2-digit number with regrouping
		6	solve word problems

		7	identify addition and subtraction fact families
		8	solve problems in context using addition and subtraction
		9	solve problems in context using addition and subtraction
		10	**Consolidation and review**
14	Money **Key Vocabulary** coin gold round silver heptagonal copper pence value penny worth pennies coin greatest value least value buy sell afford total cost pounds change	1	identify the physical properties of coins
		2	recognise the value of different coins
		3	recognise the value of different coins
		4	identify the value of different coins and notes
		5	compare different amounts of money
		6	use addition and subtraction in the context of money
		7	exchange money for items
		8	find the total cost of two items
		9	calculate change
		10	calculate change
15	Multiplication and division **Key Vocabulary** array altogether equal groups rectangular equal unequal share fair	1	describe arrays
		2	create rectangular arrays
		3	create rectangular arrays
		4	identify whether groups of objects are equal or unequal

	whole divide lots of unknown skip count known half halve double share half quarter fraction	5	share a total equally between a given number of groups
		6	share a total equally between a given number of groups
		7	share a total equally and find the number of groups
		8	share a total equally and find the number of groups
		9	solve multiplication problems
		10	solve multiplication problems
		11	connect doubling and halving
		12	find double and half of an amount of money
		13	Halves and quarters
		14	find a quarter of a quantity
		15	**Consolidation Lesson**
16	Measures (2): Capacity and volume **Key vocabulary** compare capacity greater smaller about unit half quarter capacity volume standard unit distance measure length weighing scales weigh gram	1	directly compare the capacities of two containers
		2	indirectly compare capacities by measuring in non-standard units
		3	compare different volumes
		4	apply understanding of halves and quarters to capacity
		5	introduce a litre as a standard unit of measure
		6	explore difference by comparing measures of length and volume
		7	explore difference by comparing measures of length and volume
		8	apply understanding of measurement in a real-life context
		9	apply understanding of measurement in a real-life context
		10	**Consolidation and review**

Year 2

Autumn

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Numbers within 100		**Addition and subtraction of 2-digit numbers**		**Addition and subtraction word problems**		**Measures: Length**		**Graphs**	**Multiplication and division**		
• Read, write, represent, partition, compare and order numbers to 100 • Explore patterns including, odds and evens, tens and ones		• Apply number bonds to add and subtract • Represent and explain addition and subtraction of two 2-digit numbers. • Add three 1-digit numbers		• Introduction to bar models as a representation • Create, label and sketch bar models		• Draw and measure lengths in centimetres • Use <, > and = to compare and order lengths in metres and centimetres		• Represent and interpret: pictograms, block diagrams, tables and tally charts.	• Explore multiplication and division through arrays • Explore division as grouping and as sharing • Connect multiplication and division facts using commutativity and inverse • Calculate the times tables of 2, 5, and 10 using different strategies		

Spring

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11
Time		**Fractions**		**Addition and subtraction of 2-digit numbers**		**Money**		**Face, shapes and patterns; lines and turns**		
• Tell the time on an analogue clock: quarter past, quarter to and five minute intervals • Calculate durations of time in minutes and seconds • Sequence daily events • Minutes in an hour and hours in a day		• Part-whole relationships • Fractions as part of a whole or a whole set • Relate to division • Equivalent fractions		• Illustrate, represent and explain addition and subtraction involving regrouping including 'Make Ten', 'Round and adjust' and near doubles strategies		• Recognise coins and notes • Use £ and p accurately • Add and subtract amounts • Calculate change		• Explore, sort and describe 2-D shapes • Lines of symmetry in 2-D shapes • Identify 2-D shapes on 3-D shapes • Compare and sort 2-D and 3-D shapes • Use language to describe position, direction and rotation to follow a route		

Summer

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Numbers within 1000	**Measures: Capacity and volume**		**Measures: Mass**	**Exploring calculation strategies**		**Exploring multiplicative thinking**	
• Represent in different ways • Compare using symbols • Read scales	• Read and measure temperature • Estimate, measure and understand litres and millilitres • Compare and order capacities		• Weigh and compare masses in kilograms and grams	• Apply addition and subtraction strategies to solve equations • Illustrate and explain addition and subtraction using column method		• Pattern seek with multiples of 2, 3, 4 5 and 10 using an array • Use known facts to derive facts from the 3 and 4 times tables. • Connect multiplication and division facts using commutativity and inverse	

Autumn	**1. Number within 100** **(2 weeks)**	• use place value and number facts to solve problems • recognise the place value of each digit in a two-digit number (tens, ones) • identify, represent and estimate numbers to 100 using different representations, including the number line • compare and order numbers from 0 up to 100; use <, > and = signs • read and write numbers to at least 100 in numerals and in words • count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward *(during transitions)*
	2. Addition and subtraction of 2-digit numbers **(2 weeks)**	• recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers; adding three one-digit numbers
	3. Addition and subtraction word problems (2 weeks)	• recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems • solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures; applying their increasing knowledge of mental and written methods
	4. Measures: length (2 weeks)	• choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm) to the nearest appropriate unit, using rulers and scales • compare and order length and record the results using >, < and = • use standard units of measurement with increasing accuracy, using their knowledge of the number system (to 100). They use the appropriate language and record using standard abbreviations (cm/m) (non-statutory)
	5. Graphs **(1 week)**	• interpret and construct simple pictograms, tally charts, block diagrams and simple tables • ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity • ask and answer questions about totalling and comparing categorical data
	6. Multiplication and division **(3 weeks)**	• calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts • show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers

Spring	**7. Time** **(2 weeks)**	• tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times • know the number of minutes in an hour and the number of hours in a day • compare and sequence intervals of time
	8. Fractions **(2 weeks)**	• recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity • write simple fractions for example, $\frac{1}{2}$ of 6 = 3 • recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$
	9. Addition and subtraction of 2-digit numbers (regrouping and adjusting) **(2 weeks)**	• recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers; adding three one-digit numbers • solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures; applying their increasing knowledge of mental and written methods
	10. Money **(2 weeks)**	• recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value • find different combinations of coins that equal the same amounts of money • solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change
	11. Faces, shapes and patterns; lines and turns **(3 weeks)**	• identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces • identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] • identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line • compare and sort common 2-D and 3-D shapes and everyday objects • order and arrange combinations of mathematical objects in patterns and sequences • use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise)

Summer	**12. Number within 1000** **(1 week)**	• use place value and number facts to solve problems • identify, represent and estimate numbers to 1000 using different representations (Y3 objective) • recognise the place value of each digit in a three-digit number (hundreds, tens, ones) (Y3 objective) • compare and order numbers up to 1000 (Y3 objective) • read and write numbers up to 1000 in numerals and in words (Y3 objective) • count from 0 in multiples of 100; find 10 or 100 more or less than a given number (Y3 objective)
	13. Measures: capacity and volume (2 weeks)	• choose and use appropriate standard units to estimate and measure capacity (litres/ml) and temperature (°C) to the nearest appropriate unit, using scales, thermometers and measuring vessels • compare and order volume and capacity and record the results using >, < and = • use standard units of measurement with increasing accuracy, using their knowledge of the number system (to 1000). They use the appropriate language and record using standard abbreviations (litres/ml and °C) (non-statutory)
	14. Measures: mass (1 week)	• choose and use appropriate standard units to estimate and measure mass (kg/g) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels • compare and order mass and record the results using >, < and = • use standard units of measurement with increasing accuracy, using their knowledge of the number system (to 1000). They use the appropriate language and record using standard abbreviations (g/kg) (non-statutory)
	15. Exploring calculation strategies **(2 weeks)**	• recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • add and subtract numbers mentally, including: a two-digit number and ones; a two-digit number and tens; adding three one-digit numbers • solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures, applying their increasing knowledge of mental and written methods
	16. Multiplicative thinking **(2 weeks)**	• calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts • show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • practise their mental recall of multiplication tables when they are calculating mathematical statements in order to improve fluency. Through doubling, they connect the 2 and 4 multiplication tables. (Y3, non-statutory)

Cycle	Unit	Lesson	Granular Knowledge
1	Numbers within 100 **Key Vocabulary** Group, altogether, tens, left over, strategy, ones, 1-digit-number, 2-digit-number, value, worth, partition, represents, compare, greatest, smallest, greater than, less than, equal to, order, decreasing, increasing, more, less, forwards, backwards, counting, even, odd	1	Recognise the place value of each digit in numbers within 100
		2	Identify tens and ones in a 2-digit number
		3	Partition 2-digit numbers
		4	Partition 2-digit numbers
		5	Represent 2-digit numbers
		6	Read and write numbers to 100 in words
		7	Compere numbers to 100
		8	Order numbers to 100
		9	Explore number patterns
		10	Explore odd and even numbers
2	Add and subtract 2-digit numbers **Key Vocabulary** Part, whole, ones, tens, 'If I know… then I know', partition, number bonds, doubles, near doubles,	1	Use number bonds within 20 in addition
		2	Use number bonds within 20 in subtraction
		3	Add and subtract ones to/from a 2-digit number
		4	Add and subtract multiples of 10
		5	Add and subtract tens to/from a 2-giist number
		6	Add two 2-digit numbers
		7	Apply knowledge of number bonds within ten to derive subtraction facts within 100
		8	Add and subtract two 2-digit numbers
		9	Add three 1-digit numbers
		10	**Consolidation and review**
3	Addition and subtraction word problems **Key Vocabulary** Part, whole, add, subtract, part-whole model, bar model, known, unknown, value, add, subtract, add,	1	Combination and partitioning: Represent information as a bard model
		2	Augmentation and reduction: Represent information as a bar model
		3	Create and label bar models
		4	Create bar models
		5	Sketch bar models that represent word problems.
		6	Represent comparison problems using bar models
		7	Represent comparison problems using bar models

	subtract, fewer, more, difference,	8	Represent one- and two-step word problems using bar models
		9	Identify suitable bar models to represent problems.
		10	**Consolidation and review**
4	Measuring Length **Key Vocabulary** Length, long, longer, longest, short, shorter, shortest, measure, metre, estimate, ruler, centimetre, about, exactly, the same as, known, unknown,	1	Use non-standard and standard units when measuring
		2	Compare and order lengths in metres (using <, >, =)
		3	Use a ruler to measure length in centimetres
		4	Compare and order length in centimetres (using <, >, =)
		5	Use a ruler to measure lines
		6	Use a measuring tape to measure centimetres
		7	Use a ruler to draw lines with specified lengths
		8	Solve word problems involving length
		9	**Consolidation and review**
		10	**Consolidation and review**
5	Graphs **Key Vocabulary** Data, collect, sort, interpret, pictogram, table, block diagram, sort, tally, scaled,	1	Represent and interpret data using a pictogram and table
		2	Represent and interpret data using a block diagram and table
		3	Represent and interpret data using a tally chart and scaled pictogram
		4	Represent and interpret data using a tally chart and scaled block diagram
		5	Interpret data from scaled pictograms and block diagrams
6	Multiplication and division **Key Vocabulary** Part, unequal, equal, array, value, left over, whole, commutativity, share, divide, groups, multiply, multiple, two, five, ten, pattern	1	Explore arrays
		2	Use an array to explore commutativity
		3	Explore a structure of division: division as sharing
		4	Explore a structure of division: division as grouping
		5	Explore structures of division using representations
		6	**Consolidation and review**
		7	Connect structures of multiplication and division
		8	Find related multiplication and division facts
		9	Use counting strategies to calculate multiples of two
		10	Relate the two times table to doubling and halving
		11	Use counting strategies to calculate multiples of 10

		12	Use counting strategies to calculate multiples of five
		13	Spot patterns using the two, five and ten multiplication tables
		14	Apply multiplicative thinking
		15	**Consolidation and review**
7	Time **Key Vocabulary** Time, hour, noon, night, day, morning, afternoon, midday, evening, midnight, hour, minute, hour hand, minute hand, scale, quarter past, half past, o'clock, to, quarter to, earlier, later, duration, start, finish,	1	Know that there are 24 hours in one day
		2	Know that there are 60 minutes in one hour
		3	Identify 'quarter past' on an analogue clock
		4	Identify 'quarter to' on an analogue clock
		5	Read the time 'past' the hour on the clock to the nearest five minutes
		6	Read the time 'to' the hour on the clock to the nearest five minutes
		7	Sequence daily events
		8	Calculate durations of time in minutes
		9	Calculate duration of time in hours and minutes
		10	**Consolidation and review**
8	Fractions **Key Vocabulary** Equal parts, quarter, share, whole, fraction, divide, half, numerator, whole, vinculum, denominator, one half, one third, one quarter, halves, thirds, equivalent, the same as, is equal to,	1	Relate halves and quarters to division
		2	Identify the written parts of a fraction
		3	Identify half of a shape
		4	Identify halves, thirds and quarters of a shape
		5	To identify fractions of shapes with different numerators
		6	Identify unit fractions of a quantity
		7	Identify fractions of a quantity and shape
		8	Identify fractions quantity and shape
		9	Identify one half and two quarters as equivalent fractions
		10	**Consolidation and review**
9	Add and subtract two digit numbers (regrouping and adjusting) **Key Vocabulary** Make ten, number bonds, partition, ones, number line, regroup, tens, ones, number line, dienes, bar model, round and adjust, multiple of ten,	1	Use the 'make ten' strategy to add ones
		2	Regroup when adding
		3	Regroup when adding
		4	Use the 'Make ten' strategy to subtract ones
		5	Regroup when subtracting
		6	Solve addition and subtraction word problems
		7	Add near multiples of ten

	add, subtract, near double, double,	8	Subtract near multiples of ten
		9	Mentally add near doubles
		10	**Consolidation and review**
10	Money **Key Vocabulary** Penny, pennies, pence, value, compare, greater, lower, 1p, 2p, 5p, 10p, 20p, 50p, one pound, pounds, coin, notes, greater, lower, how much, total, altogether, same as, equal to, count up, costs, change, left, addition, total, how much?, fewest, equal, same, spent, how many, all possibilities, systematically,	1	Recognise and compare the value of coins
		2	Recognise the value of coins and notes and use the £ symbol accurately
		3	Find the total of a set of coin
		4	Make the same total using different coins
		5	Calculate change from a pound/
		6	Create an amount of money in different ways
		7	Work out change in pounds and pence
		8	Solve problems relating to money
		9	**Consolidation and review**
		10	**Consolidation and review**
11	Faces, shapes and patterns, lines and turns **Key Vocabulary** Circle, vertex, triangle pentagon, side, quadrilateral, hexagon, straight, square, heptagon, curved, square, octagon, rectangle, vertices, sides, 2-D shapes, half, symmetry, exact, reflection, identical, straight lines, right angle, sort, properties, criteria, Venn diagram, lines of symmetry, sphere,	1	Identify shapes by numbers of vertices and sides
		2	Identify right angles in shapes
		3	Recognise lines of symmetry withing 2-D shapes
		4	Describe and sort 2-D shapes according to their properties
		5	Name and describe 3-D shapes
		6	Identify 2-D shapes on the surfaces of 3-D shapes
		7	Describe and create shape patterns
		8	Compare and sort 2=D and 3-D shapes
		9	Describe the position of an object
		10	Give directions from point A to point B
		11	Use the language of rotation

	cone, cylinder, edge, cube, width, depth, face, apex, cuboid, pyramid.	12	Make predictions about rotation
		13	Identify how a pattern has been created through rotation
		14	Follow a route around a map
		15	**Consolidation and review**
12	Numbers within 1000 **Key Vocabulary** Hundreds, whole, tens, ones, parts, part-whole, place value, place value char, 0-999, regrouping, dienes, compare, less than, greater than, more, fewer, the same as, scale, mark, interval.	1	Recognise the place value of each 3-digit number
		2	Explore 3-digit numbers using the part-whole model
		3	Show the value of a 3-digit number in more than one way
		4	Compare numbers within 1000 using the <, = and > signs
		5	Accurately read scales withing 1000 units
13	Measuring capacity and volume **Key Vocabulary** Temperature, thermometer, unit of measure, degrees Celsius, °C, heat, hot, cold, warmer, cooler, more than. Less than, estimate, one litre, measure, volume, capacity, bar model, litre, millilitre, different, compare, half double, altogether, number bonds, equation, part, whole, total.	1	Read temperature in degrees Celsius on a thermometer
		2	Read temperature in degrees Celsius on a thermometer
		3	Understand what a litre is and to estimate and measure in litres
		4	Solve word problems that involve litres
		5	Compare millilitres and litres using fractions
		6	Use millilitres as a unit of measure
		7	Compare and order millilitres and litres
		8	Use known number bonds to derive related facts to 1000 in the context of measure
		9	Solve capacity and volume work problems

		10	**Consolidation and review**
14	Mass **Key Vocabulary** Mass, unit, heavier than, lighter than, weigh, standard unit, kilogram, as heavy as, gram, 1000, difference, total, multiply, divide, add, part, whole.	1	Weigh and compare the mass of objects in kilograms
		2	Interpret scales labelled in grams and compare masses of objects measured in grams
		3	Apply addition and subtraction in the context of mass
		4	Solve multiplication and division problems about mass
		5	Consolidate knowledge of mass through investigations
15	Exploring calculation strategies **Key Vocabulary** Make ten, number bonds, partition, round and adjust, known facts, near doubles, part, unknown, whole, add, known, subtract, more, fewer, less, difference, place value, tens, column, ones, is equal to	1	Apply addition strategies to solve equations
		2	Apply subtraction strategies to solve equations
		3	Solve word problems: part whole
		4	Solve word problems: comparison
		5	Add two 2-digit numbers using the column method
		6	Add two 2-digit numbers using the column method
		7	Subtract 2-digit numbers using the column method
		8	Subtraction 2-digit numbers using the column method
		9	**Consolidation and review**
		10	**Consolidation and review.**
16	Exploring multiplicative thinking **Key vocabulary** Multiple, odd, pattern, even, conjecture, groups, array, If I know – then I know, whole, equal, unequal, left over, digit,	1	Explore patterns of multiples of 2, 5 and 10.
		2	Explore the relationship between multiples of 2 and 4
		3	Explore the patterns between multiples of 2, 4, 5 and 10
		4	Apply known times table facts to calculate new facts
		5	**Consolidation and review**
		6	Reason about multiplicative relationships

	multiplied by, equal group, add another, groups, commutative, inverse, half, third, quarter, divide, multiply, share	7	Reason about multiplicative relationships including fractions
		8	Recognise the inverse relationship between multiplication and division
		9	Explore relationships within and between multiplication and division
		10	**Consolidation and review**

Year 3

Autumn

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11
Number sense and exploring calculation strategies			**Place value**		**Graphs**	**Addition and subtraction**			**Length and perimeter**	
• Read, write, order and compare numbers to 100 • Calculate mentally using known facts, round and adjust, near doubles, adding on to find the difference • Derive new facts from a known fact			• Read, write, represent, partition, order and compare 3-digit numbers • Find 10 and 100 more or less • Round to the nearest multiple of 10 and 100		• Collect, interpret and present data using charts and tables	• Develop and use a range of mental calculation strategies • Illustrate and explain formal written methods – column method			• Measure, draw and compare lengths • Add and subtract lengths • Calculate perimeter	

Spring

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Multiplication and division		**Calculating with multiplication and division**			**Time**		**Fractions**		
• Understanding multiplicative relationships: commutativity and inverse • Exploring multiplication and division facts for 2, 3, 4, 5, 6, 8 and 10		• Multiply and divide by 10 • Multiply a 2-digit number by a 1-digit number • Divide 2-digit by a 1-digit • Correspondence problems			• Tell, record, write and order the time analogue and digital • 12-hour, a.m., p.m. • Measure, calculate and compare durations		• Part-whole relationships • Fractions as part of a whole or a whole set and as a number • Add, subtract, compare and order fractions		

Summer

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9
Angles and shape			**Measures**			**Applying multiplicative thinking**	**Exploring calculation strategies and place value**	
• Identify angles including right angles and recognise as a quarter of a turn • Identify and draw parallel and perpendicular lines • Draw/make, classify and compare 2-D and 3-D shapes • Measure the perimeter			• Read scales with different intervals when measuring mass and volume • Weigh and compare masses and capacities with mixed units • Estimate mass and capacity			• Representing multiplication and division problems • Solve a one-step problem	• Add and subtract mentally • Find 10, 100 and 1000 more or less • Order and compare beyond 1000 • Round numbers	

Autumn	1. Number sense and exploring calculation strategies (3 weeks)	• recognise the place value of each digit in a two-digit number (tens, ones) (Y2 objective) • read and write numbers up to 100 in numerals and in words (Y2 objective) • compare and order numbers (up to 100) • find 10 more or less than a given number (Do Nows and transitions) • identify, represent and estimate numbers using different representations, including the number line • solve number problems and practical problems involving these ideas • solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction • add and subtract amounts of money to give change, using both £ and p in practical contexts
	2. Place value (2 weeks)	• find 10 or 100 more or less than a given number • recognise the place value of each digit in a three-digit number (hundreds, tens, ones) • compare and order numbers up to 1000 • read and write numbers up to 1000 in numerals and in words • solve number problems and practical problems involving these ideas • count from 0 in multiples of 50 and 100 • round any number to the nearest 10 or 100 (Y4 objective)
	3. Graphs (1 week)	• interpret and present data using bar charts, pictograms and tables • solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables
	4. Addition and subtraction (3 weeks)	• add and subtract numbers mentally, including: a three-digit number and ones; a three-digit number and tens; a three-digit number and hundreds • add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction • estimate the answer to a calculation and use inverse operations to check answers • solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction
	5. Length and perimeter (2 weeks)	• measure, compare, add and subtract: lengths (m/cm/mm) • measure the perimeter of simple 2-D shapes • continue to measure using the appropriate tools and units, progressing to using a wider range of measures, including comparing and using mixed … and simple equivalents of mixed units (for example, 5m = 500cm) (non-statutory) • measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres (Y4 objective)

1

Spring	**6. Multiplication and division (2 weeks)**	• recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables • count from zero in multiples of 4 • solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which *n* objects are connected to *m* objects • Practise their mental recall of multiplication tables when they are calculating mathematical statements in order to improve fluency. Through doubling, they connect the 2, 4 and 8 multiplication tables.
	7. Calculating with multiplication and division (3 weeks)	• recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables • write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods • solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which *n* objects are connected to *m* objects • use place value, known and derived facts to multiply and divide mentally (Y4 objective)
	8. Time (2 weeks)	• tell and write the time using 12-hour analogue and digital clocks, including using Roman numerals from I to XII • estimate and read time with increasing accuracy to the nearest minute • record and compare time in terms of seconds, minutes and hours • use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight • know the number of seconds in a minute and the number of days in each month, year and leap year • compare durations of events [for example to calculate the time taken by particular events or tasks]
	9. Fractions (3 weeks)	• recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators • recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators • count up and down in tenths • recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 • recognise and show, using diagrams, equivalent fractions with small denominators • add and subtract fractions with the same denominator within one whole *[for example,* $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$ *]* • compare and order unit fractions, and fractions with the same denominators • solve problems that involve all of the above

Summer	**10. Angles and shape** **(3 weeks)**	• recognise angles as a property of shape or a description of a turn • identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle • identify horizontal and vertical lines and pairs of perpendicular and parallel lines • draw 2-D shapes and make 3-D shapes using modelling materials • recognise 3-D shapes in different orientations and describe them • measure the perimeter of simple 2-D shapes
	11. Measures (3 weeks)	• measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) • solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction • continue to measure using the appropriate tools and units, progressing to using a wider range of measures, including comparing and using mixed units (for example, 1 kg and 200g) and simple equivalents of mixed units (for example, 5m = 500cm) (non-statutory)
	12. Applying multiplicative thinking **(1 week)**	• write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods • solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects. • recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
	13. Exploring calculation strategies and place value (2 weeks)	• add and subtract numbers mentally • use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers (Y4 objective) • Using a variety of representations, including measures, pupils become fluent in the order and place value of numbers beyond 1000, including counting in tens and hundreds, and maintaining fluency in other multiples through varied and frequent practice (non-statutory) • 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) (Y4 objective) • order and compare numbers beyond 1000 (Y4 objective) • round any number to the nearest 10, 100 or 1000 (Y4 objective)

Cycle	Unit	Lesson	Granular Knowledge
1	Number sense and exploring calculation strategies **Key Vocabulary** number add is equal to odd even subtract number bond because inverse derive commutative number bond place value commutability digit ones number numeral tens compare greater than greatest order less than equal to least calculation strategy addition subtraction near multiple round adjust	1	link and apply known facts to develop number sense.
		2	derive new facts from number bonds.
		3	deepen understanding of the number system.
		4	recognise the value of each digit in a 2-digit number.
		5	use <, > and = when comparing numbers.
		6	**Consolidation and review**
		7	find number bonds for numbers up to 20
		8	add and subtract 2-digit numbers without regrouping
		9	add and subtract 2-digit numbers with regrouping
		10	**Consolidation and review**
		11	use 'round and adjust' to add and subtract near multiples of ten
		12	use near doubles as an efficient mental addition strategy
		13	use an 'adding on' strategy to find the difference
		14	represent addition and subtraction problems using bar models
		15	**Consolidation and review**
2	Place value **Key Vocabulary** place value digit numeral position hundreds tens part partition whole regroup compare greater greatest more less most fewer fewest least increase decrease rounding nearest systematic strategy	1	identify and represent 3-digit numbers
		2	partition numbers in different ways
		3	order and compare 3-digit This week numbers
		4	add and subtract ten and 100
		5	round 2- and 3-digit numbers to the nearest multiple of ten
		6	find all possible numbers that could have been rounded to a multiple of ten
		7	round 3-digit numbers to the nearest multiple of 100
		8	apply place value knowledge to problem solving
		9	find all possible solutions to a problem

	investigate open-ended predict	10	**Consolidation and review**
3	Graphs **Key Vocabulary** Pictogram Key Information Data Symbol Stands for Represents Table Row Column Twice as many Three times as many Total Scale Axis Axes Increases Tally	1	read and interpret pictograms with units greater than one
		2	present data from a table in a pictogram, with symbols representing more than one
		3	read and interpret scaled bar charts
		4	collect data using a tally and present it in tables and scaled bar charts
		5	interpret and present data in pictograms and scaled bar charts
4	Addition and subtraction **Key Vocabulary** addition plus number bond partition inverse subtraction minus part whole 'Make ten' multiple add inverse place value digit accurate rounding round nearest multiple of 100 accuracy column method strategy quantity known unknown bar model whole part	1	use number bonds when calculating mentally
		2	use number bonds when calculating mentally
		3	use mental strategies for subtraction with 3-digit numbers
		4	add or subtract multiples of 100 to or from 3-digit numbers
		5	add or subtract two 3-digit numbers, without regrouping
		6	**Consolidation and review**
		7	use rounding to estimate the answer for a calculation
		8	add two 3-digit numbers using column addition
		9	add two 3-digit numbers using column addition
		10	subtract 3-digit numbers using column subtraction
		11	subtract 3-digit numbers using column subtraction
		12	subtract 3-digit numbers using column subtraction
		13	solve word problems using addition and subtraction skills
		14	interpret and represent addition and subtraction problems with bar models
		15	**Consolidation and review**
5	Length and perimeter **Key Vocabulary** length height width measure ruler to	1	measure length to the nearest centimetre and millimetre
		2	measure and draw lines in mixed units (centimetres and millimetres)
		3	estimate length using comparisons
		4	**Consolidation and review**

	the nearest … centimetre (cm) millimetre (mm) accurate estimate about roughly a bit more than a bit less than length millimetre long metre height high width wide longer shorter equal to (=) greater than (>) less than (<)perimeter measure calculate total distance altogether	5	calculate the perimeters of 2-D shapes in centimetres or millimetres
		6	calculate the perimeters of 2-D shapes in mixed units (centimetres and millimetres)
		7	measure and compare lengths in mixed units
		8	calculate the perimeters of 2-D shapes in mixed units (metres and centimetres)
		9	apply problem-solving strategies in the context of length
		10	**Consolidation and review**
6	Multiplication and division **Key Vocabulary** bar model Cuisenaire array groups of equal parts whole value division multiplication art whole commutative equal parts value factor product columns rows array fact family double	1	explore representations of multiplication and division
		2	represent multiplication and division contexts using bar models
		3	understand that multiplication can be completed in any order
		4	apply knowledge of factors to multiplication contexts
		5	understand the inverse relationship between multiplication and division
		6	apply knowledge of the inverse to find related facts
		7	apply knowledge of the inverse to solve missing number problems
		8	apply knowledge of the inverse to solve missing number problems
		9	explore the relationship between four and eight times table
		10	**Consolidation and review**
7	Calculating with multiplication and division **Key Vocabulary** array factor column product row equal groups known unknown ten times as many ten times the size scaling tens ones for every one tenth commutative inverse partition	1	explore patterns in multiples of 8
		2	solve problems that involve scaling by 10
		3	multiply by 10
		4	divide by ten
		5	explore related multiplication facts
		6	derive facts from known multiplication facts
		7	multiply a 2-digit number by three, four or five, without regrouping
		8	multiply a 2-digit number by three, four or five, with regrouping
		9	multiply a 2-digit number by three, four or five, with regrouping
		10	**Consolidation and review**
		11	explore division structures
		12	explore sharing and grouping in context

	array quotient grouping dividend divisor sharing	13	divide a 2-digit number by partitioning
		14	divide a 2-digit number by partitioning
		15	solve correspondence problems
8	Time **Key Vocabulary** scale hour hand indicate recorded time indicator minute hand ___ minutes to ___ ___ minutes past ___ analogue division nearest minute interval clockwise anti-clockwise am pm earlier earliest later latest chronological order digital format since stopwatch second time interval stop-clock timer estimate schedule start time calculate timetable end time timeline	1	understand that clocks are measuring devices with more than one scale
		2	read analogue times to the nearest minute
		3	understand and correctly use am and pm to read, record and order times
		4	tell the time using 'minutes past' on a digital clock
		5	read and order times in words, analogue or 12-hour digital formats
		6	understand the units of measured time
		7	measure intervals in seconds and in minutes and seconds
		8	calculate and compare intervals given start and finish times
		9	apply knowledge and understanding of time to solve real-world problems
		10	**Consolidation and review**
9	Fractions **Key Vocabulary** part part of the whole divide fraction names denominator whole divide vinculum numerator split equal unequal multiplication division ninth tenth unit fraction non-unit fraction compare solve greater more less fewer half halves quarter eighth third sixth	1	describe part-whole relationships
		2	recognise equal and unequal parts
		3	recognise, identify and describe unit fractions
		4	find a fraction of a given quantity
		5	recognise and describe unit and non-unit fractions
		6	identify, describe and write non-unit fractions
		7	find non-unit fractions of a given quantity
		8	compare fractions with the same denominator
		9	compare unit fractions
		10	**Consolidation and review**
		11	recognise equivalent fractions
		12	recognise equivalent fractions

		13	recognise equivalent fraction
		14	add and subtract fractions with the same denominator within one whole
		15	**Consolidation and review**
10	Angles and shape **Key Vocabulary** angle smallest greater smaller greatest property of a shape description of a turn angle turn 2-D shape property 3-D shape edge face side vertex vertices right angle complete whole two quarters turn three quarters one quarter one half four quarters two halves obtuse acute perpendicular vertical horizontal parallel equal distance right angle quadrilateral rectangle straight square side vertex / vertices symmetry symmetrical line of symmetry exactly the same mirror image Star Words reflective	1	know that an angle is formed where lines meet and that angle is also a measure of turn
		2	identify angles in shapes
		3	recognise the relationship between right angles and quarter, half, three-quarter and full turns
		4	identify acute and obtuse angles
		5	**Consolidation and review**
		6	identify pairs of perpendicular lines
		7	draw a line that is perpendicular to a given line
		8	identify pairs of parallel lines
		9	**Consolidation and review**
		10	know that all rectangles have four straight sides and four right angles
		11	make, draw and describe 2-D shapes using their properties
		12	draw 2-D shapes from given properties
		13	make and describe 3-D shapes
		14	recognise shapes with reflective symmetry
		15	**Consolidation and review**
11	Measures **Key Vocabulary** indicators scale weighing scales interval measure weigh weight round / rounding to the nearest mass gram kilogram < >	1	read measurements from weighing scales with different intervals
		2	use mixed units to weigh and compare mass
		3	estimate the mass of an object
		4	read scales to measure volume
		5	use measuring containers to measure and compare capacity in mixed units

	= estimate heavier lighter measure actual mass capacity volume litres measuring container millilitres comparison difference addition subtraction multiplication division	6	estimate the capacity of a container
		7	**Consolidation and review**
		8	**Consolidation and review**
		9	use bar modelling to represent addition and subtraction word problems
		10	use bar modelling to represent measure problems and solve them using addition or subtraction
		11	use bar modelling to represent multiplication and division word problems
		12	use bar modelling to represent measure problems and solve them using multiplication or division
		13	**Consolidation and review**
		14	apply knowledge and understanding of measures to solve real-world problems
		15	**Consolidation and review**
12	Applying multiplicative thinking **Key Vocabulary** bar model twice as many three times as many double half of one quarter of one third of multiplication commutative times factor equal parts whole product division group share multiplication commutative times factor equal parts whole product division group share	1	interpret a word problem using a bar model
		2	represent and solve multiplication and division problems
		3	represent and solve problems from all four operations
		4	Represent and solve twostep word problems
		5	**Consolidation and review**
13	Exploring calculation strategies and pace value **Key Vocabulary**	1	apply a range of strategies to add mentally
		2	apply a range of strategies to subtract mentally

	near multiple strategy round adjust efficient partition adding on counting back factor product efficient commutative representations greater than (>) less than (<) ascending greatest descending round value	3	apply addition and subtraction strategies within a context
		4	use commutativity, associativity and known facts to multiply efficiently
		5	use halving or doubling to calculate efficiently
		6	**Consolidation and review**
		7	identify the value of each digit in a 4-digit number
		8	compare and order 4-digit numbers
		9	add and subtract 1,000
		10	round 4-digit numbers to the nearest multiple of 1,000 This we

Year 4

Autumn

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11
Reasoning with large numbers		**Addition and subtraction**			**Multiplication and division**				**Discrete and continuous data**	
• 4-digit place value. Read, write, represent, order and compare • Find 10, 100 or 1000 more or less • Round numbers to the nearest 10, 100 or 1000		• Select appropriate strategies to add and subtract • Illustrate and explain appropriate addition and subtraction strategies including column method with regrouping			• Identify and explore patterns in multiplication tables including 7 and 9 • Distributive property including multiplying three 1-digit numbers • Mental multiplication and division strategies using place value and known and derived facts • Short multiplication				• Read, interpret and construct pictograms, bar charts and time graphs • Compare tables, pictograms and bar charts	

Spring

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11
Calculating with multiplication and division	**Fractions**				**Time**	**Decimals**			**Area and perimeter**	
• Division using partitioning • Short division	• Explore different interpretations and representations of fractions • Equivalent fractions • Represent fractions greater than one as mixed number and improper fractions • Add and subtract fractions with the same denominator including fractions greater than one				• Analogue to digital, 12-hour and 24-hour • Convert between units of time	• Decimal equivalents to tenths, quarters and halves • Compare and order numbers with same number of decimal places • Multiply and divide by 10 and 100 including decimals			• Perimeter of rectangles and rectilinear shapes • Area of rectangles and rectilinear shapes • Investigate area and perimeter	

Summer

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Solving measures and money problems			**Shape and symmetry**		**Position and direction**		**Reasoning with pattern and sequences**		**3-D shape**
• Convert units of measure • Select appropriate units to measure • Use strategies to investigate problems: trial and improvement, organising using lists and tables, working systematically			• Classify, compare and order angles • Compare and classify 2-D shapes • Identify lines of symmetry		• Describe and plot using coordinates • Describe translations		• Roman numerals up to 100 • Place value of other number systems • Number sequences and patterns		• Use understanding of 3-D shapes • Identify 3-D shapes from 2-D representations

Autumn	**1. Reasoning with 4-digit numbers** **(2 weeks)**	• 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 • solve number and practical problems that involve all of the above and with increasingly large positive numbers • identify, represent and estimate numbers using different representations • round any number to the nearest 10, 100 or 1000 • count in multiples of 25 and 1000 (through lesson Transitions as well as multiples of 10, 100 and 50)
	2. Addition and subtraction **(3 weeks)**	• add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate • estimate and use inverse operations to check answers to a calculation • solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why
	3. Multiplication and division **(4 weeks)**	• recall multiplication and division facts for multiplication tables up to 12 × 12 • solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as *n* objects are connected to *m* objects • recognise and use factor pairs and commutativity in mental calculations • use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers • multiply two-digit and three-digit numbers by a one-digit number using formal written layout
	4. Interpreting and presenting data **(2 weeks)**	• solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs • interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs

Spring	**5. Calculating with multiplication and division** **(1 week)**	• recall multiplication and division facts for multiplication tables up to 12 × 12 • use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers • practise to become fluent in the formal written method of short multiplication and short division with exact answers (non-statutory)
	6. Fractions **(4 weeks)**	• add and subtract fractions with the same denominator • recognise and show, using diagrams, families of common equivalent fractions • count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten • solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number • recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $\frac{2}{5}+\frac{4}{5}=\frac{6}{5}=1\frac{1}{5}$] (Y5 objective)
	7. Time **(1 week)**	• convert between different units of measure [for example, hour to minute] • problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days • write and convert time between analogue and digital 12- and 24-hour clocks
	8. Decimals **(3 weeks)**	• find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths • recognise and write decimal equivalents of any number of tenths or hundredths • recognise and write decimal equivalents to $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}$ • 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
	9. Area and perimeter **(2 weeks)**	• measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres • convert between different units of measure [for example, kilometre to metre] • find the area of rectilinear shapes by counting squares • calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm^2) and square metres (m^2) (Y5 objective) • measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres (Y5 objective)

Summer	**10. Solving measure and money problems** **(3 weeks)**	• convert between different units of measure [for example, kilometre to metre; hour to minute] • solve simple measure and money problems involving fractions and decimals to two decimal places • estimate, compare and calculate different measures, including money in pounds and pence
	11. 2-D shape and symmetry **(3 weeks)**	• compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes • identify acute and obtuse angles and compare and order angles up to two right angles by size • identify lines of symmetry in 2-D shapes presented in different orientations • complete a simple symmetric figure with respect to a specific line of symmetry
	12. Position and direction **(1 week)**	• describe positions on a 2-D grid as coordinates in the first quadrant • describe movements between positions as translations of a given unit to the left/right and up/down • plot specified points and draw sides to complete a given polygon
	13. Reasoning with patterns and sequences **(2 weeks)**	• read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value • count backwards through zero to include negative numbers • recognise and use square numbers, and the notation for squared (^{2}) (Y5 objective)
	14. 3-D shape **(1 week)**	• identify 3-D shapes, including cubes and other cuboids, from 2-D representations (Y5 objective)

Cycle	Unit	Lesson	Granular Knowledge
1	Reasoning with 4-digit numbers **Key Vocabulary** Ones, tens, hundreds, thousands, place value, digits, value. Compare, order, inequalities, less than, greater than, adding, subtracting, regroup, multiple, nearest, approximate, round	1	Recognise and the pace value of each 4 digit number
		2	Order and compare numbers beyond 1000
		3	Order and compare numbers beyond 1000
		4	Find ten, 100 or 1000 more or less than a given number
		5	**Consolidation and Review**
		6	Round 4-digit numbers to the nearest 10
		7	Round 4-digit numbers to the nearest 100
		8	Round 4-digit numbers to the nearest 1000
		9	Use knowledge of place value and rounding to reason with 4-digit numbers
		10	**Consolidation and Review**
2	Addition and subtraction **Key Vocabulary** Addition, subtraction, add, plus, minus, subtract, commutative, inverse, ones, tens, hundred, thousands, sum, difference, known fact, part, whole, partition, regroup	1	Derive addition and subtraction facts from known facts
		2	Derive addition and subtraction facts from known facts
		3	Choose appropriate strategies for addition
		4	Choos appropriate strategies for subtraction
		5	**Consolidation and Review**
		6	use column addition for 4-digit integers, regrouping in one column
		7	use column addition for 4-digit integers, regrouping in multiple columns
		8	use column subtraction for 4-digit integers, regrouping in one column
		9	use column subtraction for 4-digit integers, regrouping in multiple columns
		10	subtract a 4-digit integer from a multiple of 1,000
		11	represent addition and subtraction problems using bar models
		12	represent addition and subtraction problems using bar models
		13	use bar models to represent two-step addition and subtraction problems
		14	Consolidation and review

		15	Consolidation and review
3	Multiplication and division **Key Vocabulary** Multiplication, times, even, same, multiple, odd, patterns, different, table, digits, representations, multiply, factor, product, ones, tens, ten times the size, placeholder, ten times as many, one-tenth of the size, ten times greater, divide, one hundred times the size, one hundred times as much, one hundred times the size, divide, array, multiplied by, known facts, distributive law, repeated addition, scaling, quotient, dividend, divisor,	1	identify patterns in and between multiplication tables
		2	investigate using knowledge of multiplication facts
		3	explore patterns in the nine times table
		4	represent multiplication facts for seven
		5	**Consolidation and review**
		6	recognise and use factor pairs in mental calculations
		7	us place value knowledge to multiply and divide by 10
		8	use place value knowledge to multiply and divide by 100
		9	use known and derived facts to multiply mentally.
		10	combine multiplication and addition to explore the distributive law.
		11	use the distributive law to multiply a 2-digit number by a 1-digit number
		12	multiply three 1-digit numbers
		13	multiply a two-digit numbers by a one-digit number (no regrouping and regrouping)
		14	multiply a three-digit number by a one-digit number (no regrouping)
		15	multiply three-digit numbers by a one-digit number (with multiple regrouping)
		16	explore, use and apply a range of multiplication strategies
		17	**Consolidation and review**
		18	use place value, known facts and derived facts to divide mentally
		19	use a range of mental strategies to divide
		20	**Consolidation and review**
4	Discrete and continuous data **Key Vocabulary** Pictogram, tally, frequency table, compare, scale, data, bar chart, axis, horizontal, vertical,	1	Read, interpret and compare pictograms.
		2	construct pictograms
		3	read, interpret and compare bar charts
		4	construct bar charts
		5	**Consolidation and review**
		6	read and interpret time graphs
		7	construct time graphs
		8	interpret time graphs
		9	construct time graphs
		10	**Consolidation and review**
5	Calculating with multiplication and division	1	explore division by partitioning the dividend into multiples of the divisor

	Key Vocabulary Divide, divided by, groups of, partition, divisor, dividend, share, quotient, multiple, equal, share, factor, known fact, re-group, ones, tens, hundreds, multiplied by, divided by, known, unknown, distributive law,	2	use short division to divide a 2digit number by a 1-digit number
		3	use short division to divide a 3digit number by a 1-digit number, with exchanges
		4	**Consolidation and review**
		5	solve problems involving multiplication and division This wee
6	Fractions **Key Vocabulary** Numerator, denominator, vinculum, whole, equal parts, bar model, fraction wall, factors, equivalent, multiple, division, divide, equal, fraction bards, order, greater than, less than, mixed numbers, improper fractions, plus, bar model, addition, subtraction, minus,	1	recognise fractions as different representations
		2	identify and find fractions of quantities
		3	recognise equivalent fractions
		4	recognise equivalent fractions
		5	calculate non-unit fractions of quantities
		6	**find equivalent fractions using multiplication and division**
		7	solve problems involving fractions and division
		8	compare and order fractions
		9	**Consolidation and review**
		10	recognise and write mixed numbers
		11	recognise and write improper fractions
		12	convert mixed numbers to improper fractions
		13	add fractions within one
		14	subtract fractions less than one whole
		15	add fractions that sum to greater than one
		16	subtract fractions including fractions greater than one
		17	**Consolidation and review**
		18	calculate unit fractions of quantities
		19	calculate non-unit fractions of quantities
		20	compare non-unit fractions of quantities
7	Time **Key Vocabulary** Time, digital, analogue, second, minute, hour, to, past, 12-hour, 24-hour, years, months, weeks, days.	1	read, write and convert time between analogue and 12-hour digital clocks
		2	read, write and convert time between analogue and 24-hour digital clocks
		3	convert time between hours, minutes and seconds
		4	convert time between years and months, and weeks and days
		5	solve problems involving time

8	Decimals **Key Vocabulary** Decimals, fractions, equivalent, decimal point, tenths, less than, greater than, round, nearest, multiple, whole number, part-whole, addition, subtraction, hundredths, tens, ones, multiply, divide,	1	recognise and write decimal equivalents of any number of tenths
		2	recognise quantities as decimal tenths
		3	compare numbers with one decimal place
		4	round decimals with one decimal place to the nearest whole number
		5	round decimals to the nearest whole number in order to investigate a problem
		6	find number bonds using numbers with one decimal place
		7	mentally add and subtract numbers with one decimal place
		8	recognise and write decimal equivalents of any number of hundredths
		9	recognise and write decimal equivalents of any number of hundredths
		10	recognise and write decimal equivalents to one quarter, one half and three quarters
		11	order numbers with up to two decimal places
		12	multiply and divide by 10 with decimals
		13	multiply and divide by 10, including decimals
		14	multiply and divide by 100, including decimals
		15	find the effect of dividing or multiplying by 100, including decimals with one decimal place
9	Area and perimeter **Key Vocabulary** Length, breadth, perimeter, double, centimetres (cm), millimetres (mm), double, width, distance, area, cm^2, centimetres squared, square centimetres, metre, m^2, metres squared, square metres	1	measure and calculate perimeters of rectangles in cm and mm
		2	draw 2-D shapes with differing perimeters in cm
		3	calculate perimeters of rectangles in m and cm
		4	measure and calculate perimeters of composite rectilinear shapes in cm
		5	measure and calculate the perimeters of composite rectilinear shapes in m and cm
		6	understand that area is a measure of surface, measured in square units
		7	find the areas of rectangles using multiplication or counting
		8	calculate and compare the areas of rectangles including squares, using square centimetres (cm2)
		9	calculate and compare the areas of rectangles including squares, using square metres (m2)
		10	investigate the relationship between area and perimeter

10	Solving measure and money problems **Key Vocabulary** Mass, capacity, length, kilograms, grams, litres, millilitres, kilometres, metres, centimetres, millimetres, equivalent, equal, units, problem solving, patterns, increasing, compare, solution, strategy, possibilities, systematic, combinations, planning, trial and improvement, organise, weight, mass, gram, kilogram, solution, cheap, cheapest, expensive, most, least, solutions, organise, metre, quarter ¼ , half ½ , record, combination,	1	choose and use appropriate units of measure for capacity, length and mass
		2	convert between millimetres and centimetres
		3	convert between centimetres and metres
		4	convert between units of measurement
		5	**Consolidation and review**
		6	develop strategies to plan and solve problems
		7	develop strategies to plan and solve problems
		8	develop strategies to plan and solve problems
		9	develop strategies to plan and solve problems
		10	**Consolidation and review**
		11	develop strategies to plan and solve problems
		12	develop strategies to plan and solve problems
		13	develop strategies to plan and solve problems
		14	develop strategies to plan and solve problems
		15	**Consolidation and review**
11	2-S shape and symmetry **Key Vocabulary** Angle, compare, greater, smaller, order, turn, right angle, acute, obtuse, 2-D, side, vertex/verticies, pentagon, hexagon, octagon, regular/irregular, parallel, quadrilateral, equal, trapezium, square, rhombus, triangle, length,	1	Compare and order angles
		2	Identify right angles
		3	Identify acute and obtuse angles
		4	Investigate angles within shapes
		5	**Consolidation and review**
		6	compare and classify 2-D shapes
		7	compare and classify quadrilaterals
		8	compare and classify right-angled and equilateral triangles
		9	compare and classify isosceles and scalene triangles

	sides, isosceles, scalene, symmetry, symmetrical, line	10	**Consolidation and review**
		11	identify lines of symmetry in 2-D shapes
		12	complete simple symmetrical figures
		13	investigate a problem involving symmetry
		14	**Consolidation and review**
		15	**Consolidation and review**
12	Position and direction **Key Vocabulary** Axes, x-axis, y-axis, coordinates, squares, vertex, vertices, equilateral, isosceles, scalene, right angle, up, down, left, right, units, translation,	1	describe positions on a 2-D grid as coordinates
		2	investigate a problem, describing positions on a 2-D grid as coordinates
		3	plot specified points and draw sides to complete a given triangle
		4	describe movements between positions as translations of a given unit up/down or to the left/right
		5	describe movements between positions as translations of a given unit up/down or to the left/right
13	Reasoning with patterns and sequences **Key Vocabulary** Scripts, pattern, similarities, differences, roman numerals, Arabic numerals, sequences, I=1, V=5, X=10, L=50, C=100, increasing, decreasing, sequence, rule, term,	1	investigate the place value of different number systems
		2	investigate Roman numerals up to 100
		3	identify and complete number sequences
		4	investigate number patterns
		5	**Consolidation and review**
		6	investigate a pattern
		7	develop strategies to plan and solve problems

		8	develop strategies to plan and solve problems
		9	develop strategies to plan and solve problems
		10	**Consolidation and review**
14	3-D Shape **Key Vocabulary** Race, edge, vertex, vertices, 3-D, 2-D	1	apply understanding of the properties of 3-D shapes
		2	apply understanding of the properties of 3-D shapes
		3	solve problems based on 2-D representations
		4	solve problems using 2-D representations
		5	**Consolidation and review**

Year 5

Autumn

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Reasoning with large whole integers		**Integer addition and subtraction**		**Line graphs and timetables**		**Multiplication and division**			**Perimeter and area**
• Read, write, order and compare numbers up to one million • Round numbers within one million to the nearest multiple of powers of ten • Read Roman numerals up to M		• Use rounding to estimate • Use a range of mental calculation strategies to add and subtract integers • Illustrate and explain the written method of column addition and subtraction • Select efficient calculation strategies		• Complete, read and interpret data presented in line graphs • Read and interpret timetables including calculating intervals		• Identify multiples and factors • Investigate prime numbers • Multiply and divide by 10, 100 and 1000 (integers) • Multiply and divide using derived facts • Use written methods to multiply and divide • Use a range of mental calculation strategies			• Investigate area and perimeter of rectilinear shapes • Estimate area of non-rectilinear shapes

Spring

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Fractions and decimals			**Angles**		**Fractions and percentages**			**Transformations**	
• Read, write, order and compare decimals • Round decimals to the nearest whole number • Represent, identify, name, write, order and compare fractions (including improper and mixed numbers) • Calculate fractions of amounts			• Classify, compare and order angles • Measure a draw angles with a protractor • Understand and use angle facts to calculate missing angles		• Add, subtract fractions with denominators that are multiples of the same number • Multiply fractions (and mixed numbers) by a whole number • Explore percentage, decimal, fractions equivalence			• Coordinates in all four quadrants • Translation and reflection • Calculate intervals across zero as a context for negative numbers	

Summer

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Converting units of measure		**Calculating with whole numbers and decimals**			**2-D and 3-D shape**		**Volume**	**Problem solving**	
• Convert between metric units of length, mass and capacity and units of time • Know and use approximate conversion between imperial and metric		• Mental strategies to add and subtract involving decimals • Formal written strategies to add, subtract and multiply involving decimals • Multiply and divide decimal numbers by ten, 100 and 1,000 • Derive addition, subtraction and multiplication facts involving decimals			• Classify 2-D shapes and reason about regular and irregular polygons • Properties of diagonals of quadrilaterals • Classify 3-D shapes • 2-D representations of 3-D shapes.		• Use cube numbers and notation • Estimate volume • Convert units of volume	• Negative numbers and calculating intervals across zero • Calculating the mean • Interpret remainders • Investigate numbers: consecutive, palindromic, multiples	

Autumn	**1. Reasoning with large whole numbers** **(2 weeks)**	• 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 • round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 • solve number problems and practical problems that involve all of the above • read Roman numerals to 1000 (M) and recognise years written in Roman numerals
	2. Problem solving with integer addition and subtraction **(2 weeks)**	• add and subtract numbers mentally with increasingly large numbers • add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
	3. Line graphs and timetables **(2 weeks)**	• solve comparison, sum and difference problems using information presented in a line graph • complete, read and interpret information in tables, including timetables • solve problems involving converting between units of time
	4. Multiplication and division **(3 weeks)**	• identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • recognise and use square numbers and the notation for squared (^{2}) • know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers • establish whether a number up to 100 is prime and recall prime numbers up to 19 • multiply and divide whole numbers by 10, 100 and 1000 • multiply and divide numbers mentally drawing upon known facts • solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes • multiply numbers up to 4 digits by a one- or two-digit number using a formal written method • divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context • solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
	5. Perimeter and area **(1 week)**	• measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of non-rectilinear shapes

Spring	**6. Fractions and decimals** **(3 weeks)**	• compare and order fractions whose denominators are all multiples of the same number • recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $\frac{2}{5}+\frac{4}{5}=\frac{6}{5}=1\frac{1}{5}$] • identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths • read and write decimal numbers as fractions [for example, 0.71 = $\frac{71}{100}$] • round decimals with two decimal places to the nearest whole number and to one decimal place • read, write, order and compare numbers with up to three decimal places
	7. Angles **(2 weeks)**	• know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • draw given angles, and measure them in degrees (°) • identify: angles at a point and one whole turn (total 360°); angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°); other multiples of 90°
	8. Fractions, decimals and percentages **(3 weeks)**	• add and subtract fractions with the same denominator and denominators that are multiples of the same number • multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams • solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates • recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal • solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and fraction and decimal equivalents of percentages that are multiples of 10 and 25 • solve problems involving number up to three decimal places • use all four operations to solve problems involving measure (for example length, mass, volume, money) using decimal notation, including scaling
	9. Transformations **(2 weeks)**	• 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 • use the properties of rectangles to deduce related facts and find missing lengths and angles • describe positions on the full coordinate grid (all four quadrants) (Y6 objective) • interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero (through coordinates context)

Summer	**10. Converting units of measure** **(2 week)**	• convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram) • multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints
	11. Calculating with whole numbers and decimals **(3 weeks)**	• use all four operations to solve problems involving measure (for example length, mass, volume, money) using decimal notation, including scaling • solve problems involving number up to three decimal places • multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers • multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
	12. 2-D and 3-D shape **(2 weeks)**	• distinguish between regular and irregular polygons based on reasoning about equal sides and angles • use the properties of rectangles to deduce related facts and find missing lengths and angles • identify 3-D shapes, including cubes and other cuboids, from 2-D representations • recognise, describe and build simple 3-D shapes, including making nets (Y6 objective) • illustrate and name parts of circles, including radius, diameter and circumference and know that diameter is twice the radius. (Y6 objective)
	13. Volume **(1 week)**	• estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water] • recognise and use cube numbers and the notation for cubed (^{3})
	14. Problem solving **(2 weeks)**	• interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero • divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context • interpret non-integer answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding (for example, 98 ÷ 4 = 4 98 = 24 r 2 = 24 21 = 24.5 ≈ 25). (Non-statutory) • calculate and interpret the mean as an average (Y6 objective)

Cycle	Unit	Lesson	Granular Knowledge
1	Reasoning with large whole numbers **Key Vocabulary** digit hundreds place holder value ones tens thousands greater than digit value less than place holder interval	1	identify the value of each digit in a 5-digit number
		2	compare 5-digit numbers
		3	order and compare 5-digit numbers
		4	round 5-digit numbers to the nearest 100, 1,000 or 10,000
		5	identify the value of each digit in a 6-digit whole number
		6	compare and order 6-digit numbers
		7	order and compare 6-digit numbers
		8	round 6-digit numbers to the nearest 1,000, 10,000 or 100,000
		9	practise rounding skills
		10	read Roman numerals to 1,000 (M) and compare them to our number system
2	Integer addition and subtraction **Key Vocabulary** add subtract inverse row column diagonal commutative partition round adjust multiple number bond derive strategy round number line adjust greater than less than column add plus inverse place value digit regrouping error strategy	1	solve addition and subtraction problems
		2	add and subtract multiples of 10, 100, 1,000, 10,000 and 100,000
		3	add and subtract using a 'round and adjust' strategy
		4	use a range of mental partitioning strategies to add and subtract
		5	use rounding to estimate calculations
		6	use column addition to calculate with large whole numbers
		7	use column subtraction to calculate with large whole numbers
		8	use column methods to calculate with large whole numbers
		9	solve addition and subtraction problems
		10	**Consolidation and Review**
3	Use line graphs and timetables **Key Vocabulary** graph data information	1	read and interpret information presented in a line graph
		2	read and interpret information presented in a line graph
		3	read and interpret information presented in a line graph

	increase decrease x-axis y-axis axes Star Words present change time gridline interval parallel approximate perpendicular title table column sum difference row information chart data schedule row column first table timetable second third Line graph convert data measure pound (lb) foot information unit feet inch pint	4	read and interpret information presented in tables and line graphs
		5	present information as a line graph
		6	read information presented in a conversion graph
		7	read and interpret information presented in a timetable
		8	read and interpret information presented in a timetable
		9	read and interpret information in a timetable
		10	**Consolidation and Review**
4	Multiplication and division **Key Vocabulary** factor array multiple product row column systematic organised odd squared even factor composite number multiple array divisor array product …times the size factor quotient double halve regroup partition combine round strategy divide flexible estimate adjust multiple are model derive rectangle array	1	Identify factors and multiples
		2	find all factor pairs of a number
		3	identify prime numbers up to 100
		4	identify factors and multiples
		5	multiply and divide by 10, 100 and 1,000
		6	multiply and divide by 10, 100 and 1,000
		7	multiply and divide mentally, using doubling and halving
		8	solve problems using a range of calculation strategies
		9	multiply numbers with up to 4digits by a 1-digit number
		10	multiply two 2-digit numbers
		11	multiply two 2-digit numbers using long multiplication
		12	multiply a 3- or 4-digit number by a 2-digit number
		13	use multiples to divide
		14	use a written method to divide
		15	solve problems involving division with remainders
5	Perimeter and area **Key Vocabulary** length breadth distance ruler perimeter composite centimetre (cm) millimetre (mm)	1	calculate and measure perimeter
		2	calculate the area of rectangles
		3	calculate the area of rectilinear shapes
		4	compare the area and perimeter of rectilinear shapes
		5	calculate the area of nonrectilinear shapes

	metre (m) kilometre (km) dimension length square metres (m2) area surface breadth width perimeter square centimetres (cm2) rectilinear		
6	Fractions and decimals **Key Vocabulary** denominator numerator vinculum represent parts equal parts congruent area multiple factor tenth hundredth compare order mixed number equal parts ones whole improper fraction ound decimal place tens ones whole number place value divide share regroup group	1	draw, identify, name and write fractions
		2	represent, identify, name and write fractions
		3	identify, name and write equivalent fractions
		4	identify, name and write equivalent tenths and hundredths
		5	compare and order fractions
		6	read and write decimal numbers as fractions
		7	recognise and use thousandths
		8	compare and order fractions and decimals
		9	recognise and use mixed numbers and improper fractions
		10	**Consolidation and review**
		11	order and compare decimals with up to three decimal places
		12	round decimal numbers
		13	solve problems involving fractions and division
		14	**Consolidation and review**
		15	**Consolidation and review**
7	Angles **Key Vocabulary** angle turn right angle acute obtuse degrees classify internal reflex vertex polygon protractor scale reflex degrees straight line quarter half triangle equilateral isosceles scalene quadrilateral pentagon octagon polygon	1	identify, compare and order acute, obtuse and reflex angles
		2	measure angles using a protractor
		3	use a protractor to draw angles
		4	know that angles at a point are equal to 360°
		5	measure and draw reflex angles
		6	identify that angles at a point on a straight line total 180°
		7	investigate angles at a point and within shapes
		8	investigate angles within shapes
		9	**Consolidation and review**
		10	**Consolidation and review**
8	Fractions and percentages **Key Vocabulary**	1	add and subtract fractions
		2	add and subtract fractions with denominators that are multiples of the same number

	fraction part whole vinculum denominator numerator multiple mixed number equivalent improper fraction multiple mixed number equivalent improper fraction kilometres (km) metres (m) centimetres (cm) hundredths fraction equivalent decimal cent percent % percentage proportion equivalent	3	add and subtract fractions including improper fractions and mixed numbers
		4	multiply a fraction by a whole number
		5	multiply a mixed number by a whole number
		6	calculate fractions of quantities
		7	solve problems involving fractions and measure
		8	understand that percentage relates to a number of parts per hundred
		9	write percentages as fractions and decimals
		10	know fraction equivalents of percentages that are multiples of 10 or 25
9	Transformations **Key Vocabulary** translate translation grid position congruent move up down left right x-axis y-axis axes coordinate grid position congruent move reflect mirror image mirror line reflection horizontal vertical	1	describe and represent the position of a shape following a translation
		2	describe positions on a 2-D grid as coordinates
		3	use coordinates to describe a position following a translation
		4	use coordinates to describe a position following a translation
		5	**Consolidation and review**
		6	identify, represent and describe a position after reflection
		7	use coordinates to describe a position after reflection
		8	reflect a shape across the x-axis or y-axis
		9	explore reflections and translations
		10	**Consolidation and review**
10	Converting units of measure **Key Vocabulary** unit measure second minute hour interval time unit day measure week month year calendar interval	1	convert between seconds, minutes and hours
		2	convert between units of time
		3	convert between units of length
		4	convert between metric units of length
		5	convert between units of length in the context of perimeter

	fortnight time length height ruler millimetre (mm) breadth distance tape measure centimetre (cm) Star Words metre (m) kilometre (km) approximately weight mass weighing scale balance scale Star Words gram (g) kilogram (kg) tonne pound (lb) proportion fraction tape measure	6	convert between miles and kilometres
		7	convert between grams, kilograms and tonnes
		8	understand pounds and convert kilograms to pounds
		9	consolidate and apply learning in the context of the Vitruvian Man
		10	Consolidation and review
11	Calculating with whole numbers and decimals **Key Vocabulary** parts tenth place value equal parts fraction decimal hundredth thousandth placeholder counters times greater divide derive inverse algorithm column addition count on, count back, round and adjust array derive distributive property are model	1	represent decimal numbers in a variety of ways
		2	multiply decimal numbers by 10, 100 and 1,000
		3	multiply and divide by 10, 100 and 1,000, involving decimal numbers
		4	derive addition and subtraction calculations involving decimal numbers
		5	use a formal written method to add decimals
		6	use a formal written method to subtract decimals
		7	use a range of strategies to add and subtract involving decimal numbers
		8	apply addition and subtraction involving decimal numbers
		9	**Consolidation and review**
		10	**Consolidation and review**
		11	multiply a decimal number by a whole number
		12	use a written method to multiply a decimal number by a whole number
		13	use a range of strategies to multiply decimal numbers
		14	use a range of strategies to multiply decimal numbers
		15	**Consolidation and review**
12	2-D and 3-D shape **Key Vocabulary**	1	Identify, compare and classify geometric shapes based on their properties

	parallel horizontal line of symmetry dimension plane perpendicular vertical polygon side regular length vertices irregular angle length equilateral isosceles scalene obtuse right angle acute obtuse reflex quadrilateral trapezium parallelogram rhombus kite rectangle parallel square diagonal perpendicular bisect dimension curved surface vertex pyramid edge vertices prism face flat surface apex	2	identify a polygon as regular or irregular, based on reasoning about equal sides and angles
		3	compare and classify triangles based on their properties
		4	identify, compare and classify quadrilaterals based on their properties
		5	use the term 'diagonal' and make conjectures about angles formed
		6	**Consolidation and review**
		7	identify, compare and classify 3-D shapes based on their properties
		8	recognise 2-D representations of 3-D shapes
		9	build simple 3-D shapes, including making nets
		10	illustrate and name parts of circles
13	Volume **Key Vocabulary** square number squared equal factors cube number cubed product property cm3 visualise imagine estimate mm3 litre millilitre	1	recognise and use cube numbers and the notation for cubed (^{3})
		2	use centimetre cubes to estimate volume
		3	visualise and estimate the volume of solids
		4	convert units of volume
		5	**Consolidation and review**
14	Problem solving **Key Vocabulary** negative positive sum number line add subtract	1	calculate intervals across zero
		2	solve problems involving division with remainders

	difference consecutive divide fraction share decimal point group tenths hundredths thousandths regroup round average mean	3	solve problems involving division with remainders
		4	calculate and interpret the mean as an average
		5	develop strategies to plan and solve problems
		6	add two or more numbers mentally
		7	calculate across zero
		8	investigate properties of number
		9	explore properties of palindromic numbers
		10	investigate properties of number

Year 6

Autumn

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Integers and decimals		**Multiplication and division**			**Calculation problems**		**Fractions and decimals**			**Percentages (with fraction and decimal equivalence)**	**Revision and consolidation time**
• Represent, read, write, order and compare numbers up to ten million • Round numbers, make estimates and use this to solve problems in context Solve multi-step problems		• Identify and use properties of number, focusing on primes • Multiply larger integers and decimal numbers • Divide integers by 1-digit and 2-digit numbers representing remainders appropriately			• Use of brackets • Use knowledge of the order of operations to carry out calculations • Generate and describe linear number sequences • Express missing number problems algebraically • Solve equations with unknown values		• Deepen understanding of equivalence • Order, simplify and compare fractions, including those greater than one • Recall equivalence between common fractions and decimals • Find decimal quotients using short division • Add and subtract fractions • Represent multiplication involving fractions • Multiply two proper fractions • Divide a fraction by an integer			• Calculate and compare percentages of amounts • Connect percentages with fractions • Explore the equivalence	

Spring

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11
Decimals and measures			**Missing angles and length**	**Coordinates and shapes**		**Statistics**	**Proportion problems**		**Revision and consolidation time**	
• Use, read, write and convert between standard units of measures; length, mass, time, money and volume as well as imperial units • Calculate the area of parallelograms and triangles • Calculate, estimate and compare the volume of cuboids			• Compare and classify a range of geometric shapes • Use angle facts to find unknown angles	• Draw a range of geometric shapes using given dimensions and angles • Describe, draw, translate and reflect shapes on a co-ordinate plane • Recognise and construct 3-D shapes • Name parts of a circle		• Calculate the mean • Construct and interpret lines graphs and pie charts • Compare pie charts	• Use fractions to express proportion • Identify ratio as a relationship between quantities and as a scale factor • Unequal sharing involving ratio			

Summer

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Revision and consolidation time			**Post SATs units of work *(coming 2025-26)***								

Autumn	**1. Integers & Decimals (2 weeks)**	• read, write, order and compare numbers up to 10,000,000 and determine the value of each digit • round any whole number to a required degree of accuracy • solve problems involving addition and subtraction • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
	2. Multiplication and division (3 weeks)	• identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1.000 giving answers up to three decimal places • use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy • multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • multiply one-digit numbers with up to two decimal places by whole numbers • divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context • divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context • use written division methods in cases where the answer has up to two decimal places • identify common factors, common multiples and prime numbers • perform mental calculations, including with mixed operations and large numbers • solve problems which require answers to be rounded to specified degrees of accuracy
	3. Calculation problems (2 weeks)	• find pairs of numbers that satisfy an equation with two unknowns • enumerate possibilities of combinations of two variables • use knowledge of the order of operations to carry out calculations involving the four operations • generate and describe linear number sequences • express missing number problems algebraically • solve problems involving addition, subtraction, multiplication and division
	4. Fractions and decimals (3 weeks)	• use common factors to simplify fractions; use common multiples to express fractions in the same denomination • compare and order fractions, including fractions > 1 • associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$] • recall and use equivalences between simple fractions and decimals, including in different contexts • generate and describe linear number sequences (with fractions) • 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, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$] • divide proper fractions by whole numbers [for example, $\frac{1}{2} \div 2 = \frac{1}{4}$] • recall and use equivalences between simple fractions and decimals, including in different context

Autumn	**5. Percentages (with fractions and decimal equivalence) (1 week)**	• recall and use equivalences between simple fractions, decimals and percentages, including in different contexts • solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison

Spring	**6. Decimals and measures** **(3 weeks)**	• 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 • recognise when it is possible to use formulae for area and volume of shapes • use simple formulae • calculate the area of parallelograms and triangles • calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3] • generate and describe linear number sequences (with decimals)
	7. Missing angles and lengths **(1 week)**	• recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. • express missing number problems algebraically • compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
	8. Coordinates and shape **(2 weeks)**	• use negative numbers in context, and calculate intervals across zero • describe positions on the full coordinate grid (all four quadrants) • draw 2-D shapes using given dimensions and angles • draw and translate simple shapes on the coordinate plane, and reflect them in the axes • recognise, describe and build simple 3-D shapes, including making nets • illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius • solve number and practical problems that involve all of the above
	9. Statistics **(1 week)**	• interpret and construct pie charts and line graphs and use these to solve problems • calculate and interpret the mean as an average
	10. Proportion problems **(2 weeks)**	• solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts • solve problems involving similar shapes where the scale factor is known or can be found • solve problems involving unequal sharing and grouping using knowledge of fractions and multiples
	9. Percentages and statistics **(2 weeks)**	• recall and use equivalences between simple fractions, decimals and percentages, including in different contexts • solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison

Summer Term

To ensure consolidation of key concepts and knowledge, throughout the summer term, Year 6 complete project based learning that draws on the key knowledge they have learnt throughout the maths curriculum during their time at Richmond Hill Primary.

Cycle	Unit	Lesson	Granular Knowledge
1	Integers and Decimals **Key Vocabulary** digit value hundred thousands place holder millions decimal point tenths hundredths thousandths multiple midpoint rounding interval round and adjust partitioning efficient difference	1	read and write 7-digit numbers in words and numerals
		2	compare and order numbers up to ten million
		3	understand decimal place value to 3 decimal places
		4	round numbers to the required degree of accuracy
		5	apply rounding in a range of contexts
		6	explore strategies for addition
		7	explore strategies for subtraction
		8	interpret addition and subtraction problems
		9	interpret problems involving decimals
		10	apply strategies to multi-step problems
2	Multiplication and division **Key Vocabulary** ones decimal point tenths place value hundredths decimal less than greater than number property square multiple factor composite division product inverse place value estimate multiplication multiply rounding decimal dividend divisor estimate regrouping quotient multiple dividend	1	identify the value of each digit in numbers up to three decimal places
		2	multiply and divide by 10, 100 and 1000 within a context
		3	understand and use the terms 'common factor' and common multiple' as properties of numbers
		4	identify and describe factor properties of numbers (focusing on prime numbers)
		5	solve multiplication problems using known and derived facts.
		6	use efficient strategies to multiply numbers, including decimals
		7	use formal written methods for short multiplication including multiplying decimals
		8	use formal written methods, including long multiplication, to solve a range of problems
		9	**Consolidation and review**
		10	explore efficient mental strategies for division (including doubling and halving, using factors and derived facts)
		11	use the formal written method for short division

	estimate divisor regrouping quotient remainder	12	use the formal written of long division to solve appropriate calculations
		13	represent remainders in different ways depending on the context of the problem
		14	apply knowledge and understanding of multiplication, division, addition and subtraction to the real world
		15	**Consolidation and review**
3	Calculation problems **Key Vocabulary** operation order context priority inverse Order of operation ambiguous brackets priority expression sequence term term-to-term rule linear descending ascending _nth term express generalise variable unknown algebra algebraic expression variable generalise systematic comparing	1	Understand which operations have equal priority.
		2	Understand the order of operations including brackets
		3	Use and apply the order of operations
		4	Generate and describe linear number sequences
		5	Express missing numbers algebraically
		6	Create algebraic expressions for different contexts
		7	Satisfy equations with two unknowns
		8	Apply problem solving strategies
		9	**Consolidation and review**
		10	**Consolidation and review**
4	Fractions and decimals **Key Vocabulary** fraction numerator denominator part whole multiple equivalent fraction factor common factor multiple simplest form common denominator	1	identify, describe and represent fractions
		2	understand and identify equivalence
		3	find equivalent fractions in the simplest form
		4	compare and order fractions less than one
		5	convert mixed number and improper fractions
		6	compare and order fractions, greater than one
		7	add and subtract fractions with different denominators
		8	add and subtract fractions with different denominators
		9	multiply an integer by a fraction
		10	multiply two fractions
		11	divide a fraction by an integer
		12	solve problems involving fractions
		13	recall and use fraction and decimal equivalence

		14	calculate decimal equivalence using short division
		15	**Consolidation and review**
5	Percentages **Key Vocabulary** part whole percentage tenth per cent equivalent hundredth fraction equivalent greater than decimal part less than percentage whole Star Words is equal to greater than less than	1	Understanding percentages
		2	Identify equivalence between fractions, decimals and percentages
		3	solve problems involving the calculation of percentage of amounts
		4	solve problems involving the use of percentages for comparison
		5	**Consolidation and review**
6	Decimals and measures **Key Vocabulary** term to term rule nth term ascending descending linear sequence intervals equal parts scales fraction decimal equivalence mass grams kilograms convert rectangle square perimeter area formula base height triangle parallelogram area Rectilinear Side length volume approximate / approximately convert imperial unit metric unit times greater	1	generate and describe linear number sequences with decimals
		2	use, read and write standard units of measure including on scales
		3	interpret mass problems
		4	interpret problems involving mass and money
		5	reason about the perimeter and area of rectangles
		6	calculate the area of triangles and parallelograms
		7	solve missing side lengths of rectilinear shapes
		8	reason about the area of rectilinear shapes
		9	reason about the perimeter of rectilinear shapes
		10	calculate the volume of cubes and cuboids
		11	reason about the volume of cubes and cuboids
		12	convert between miles and kilometres
		13	convert between metric and imperial units of measure
		14	interpret time problems
		15	interpret problems involving timetables
7	Missing angles and lengths **Key Vocabulary** angle obtuse acute reflex right angle full turn quarter turn rotation half turn degree triangle isosceles	1	recognise angles where they meet at a point, on a straight line or are vertically opposite and find missing angles
		2	compare and classify triangles based on their properties
		3	compare and classify quadrilaterals based on their properties
		4	find unknown angles and lengths in triangles and quadrilaterals, to express missing number problems algebraically

	scalene right angle acute sides equilateral obtuse equal quadrilateral adjacent diagonal parallel perpendicular	5	calculate unknown angles in regular polygons
8	Coordinates and shape **Key Vocabulary** quadrilateral vertex / vertices acute side parallel perpendicular obtuse right angle reflex quadrant point position axis/axes translate congruent 3-D shape apex side 2-D shape face edge pyramid net prism circle circumference radius centre diameter curve/curved	1	Drawing 2-D shapes using given dimensions and angles.
		2	Describing coordinates on a full coordinates grid.
		3	Drawing and translating simple shapes on the coordinate plane
		4	Drawing and reflecting simple shapes on the coordinate plane.
		5	Drawing simple shapes on coordinates, solving problems.
		6	Drawing simple shapes on coordinates, solving problems
		7	**Consolidation and review**
		8	Recognising and describing 3-D shapes and their nets
		9	Recognising, building and describing 3-D shapes and their nets
		10	Illustrating and naming parts of a circle
9	Statistics **Key Vocabulary** mean sum average total equal share graph axes data line plot cumulative axis point interval discrete continuous pie chart segment set fraction part data percentage value interpret whole	1	calculate the mean as an average
		2	interpret line graphs
		3	accurately draw line graphs
		4	interpret data presented in pie charts
		5	accurately construct pie charts
		6	interpret and compare pie charts
10	Ratio and proportion **Key Vocabulary** additive relationship multiplicative relationship times	1	explore additive and multiplicative relationships
		2	use proportional language
		3	use ratio language
		4	use the ratio symbol

	the size greater than less than proportion whole part fraction ratio proportion ratio table multiplicative relationship convert scale factor scale factor enlarged/reduced similar	5	describe situations using proportion and ratio
		6	interpret ratio problems
		7	interpret ratio problems
		8	interpret proportion problems
		9	interpret recipe problems
		10	solve problems involving scale factors

Maths Meetings

At Richmond Hill Primary, **Maths Meetings** are a vital part of our Mathematics Mastery programme, designed to consolidate key areas of mathematics and develop fluency in recalling essential knowledge. These daily, short sessions—lasting 10 to 15 minutes—are integral to our approach, and cover several curricular strands, each broken down into short segments of around 2 to 3 minutes.

The primary purpose of Maths Meetings is to give pupils repeated practice in basic skills and concepts, supporting their fluency, consolidation, and mastery of previously taught content. Through these sessions, we provide opportunities for pupils to develop their number sense, including exploring concepts such as conservation of number, cardinality, subitising, using known facts, near doubles, commutativity, and inverse relationships.

Maths Meetings aim to be an exciting and engaging whole-class ritual, often centred around the Meeting Board or Interactive Whiteboard (IWB). They establish a routine for mathematical thinking and foster a positive classroom culture, helping pupils make connections between mathematics and everyday life.

We have clear expectations for Maths Meetings:

- All pupils must be ready to respond.
- Pupils should focus their attention on the teacher or peer leading the session.
- The use of technical vocabulary and full sentences where appropriate, should be used to continue the promotion of pupil's ability to communicate.

In addition to the guidance detail set out below, teachers are expected to tailor their Maths Meetings based on the needs of the class, prioritising key areas of knowledge that need consolidation, while also incorporating current learning where necessary. Assessments will help guide the content of each session, ensuring that they meet the specific needs of the pupils. This structured, dynamic approach ensures that Maths Meetings are a highly effective tool for supporting mathematical development across the school.

Term	Reception
Autumn	Number (ELG): • Counting on and back within ten along a number line (vertical and horizontal) • Conservation of number and cardinality activities, for example, 6 is still '6' in any arrangement and the number will stay the same unless more are added or some are taken away • Number bonds up to 5 (including subtraction facts) • One more and one fewer within 3, 6 and then within 10 Numerical patterns (ELG): • Verbally count beyond 20, recognising the pattern of the counting system. • Explore and represent patterns within numbers up to 10. • Start to identify odd and even within 10 Shape and Pattern: • Recognise, create and describe two-criteria patterns of colour or size • Matching shapes that are the same Measures: • Introduce comparative long, longer, longest, short, shorter, shortest, tall, taller, tallest, big, bigger, biggest and small, smaller, smallest Time: • Sequencing daily timetable • Days of the week • Months of the year Money: • Introduce coins 1p, 2p, 5p and 10p
Spring	Number (ELG): • Counting on and back within 20 • Subitising (recognise quantities without counting) within five • One greater or one less than a given number within 10 • Representing addition and subtraction within 10 on a ten frame • Identifying the number of groups, how many in each group and how many altogether (within 10) • Automatically recall number bonds to 5 and some number bonds to 10 Numerical patterns (ELG): • Compare quantities up to 10 in different contexts recognising when one quantity is greater than, less than or the same as the other quantity • Explore evens and odds within numbers up to 10 Shape and Pattern: • Naming 3-D and 2-D shapes and matching shapes that are the same. Time: • Days of the week; today, tomorrow and yesterday • Months of the year • Introduce the clock and talk about familiar times of the day such as the time to start school, for lunch, for the end of the school day etc. Measures: • Ordering lengths • Introduce comparative vocabulary related to weight, capacity and volume Money: • Introduce 20p coin

Summer	Number (ELG): • Double and half numbers (within 10) • Counting using the abstraction principle and subitising • Represent addition and subtraction within 10 using a bead string • Counting in twos, fives and tens • Comparing two numbers using vocabulary greater and less • Recall number bonds to 5 (and some to 10) Numerical patterns (ELG): • Verbally count beyond 20, recognising pattern of number system • Explore and represent double facts within numbers up to 10 • Explore evens and odds within numbers up to 10 • Explore how quantities can be distributed equally Shape and Pattern: • Describing the properties of 3-D and 2-D shapes using the vocabulary face, edge, side, vertices Measures: • Comparing two or more lengths, weights and capacities Time: • Introduce the clock and o'clock times

Term	Year 1
Autumn	Number: • Count on and back within 20, with a focus on ordinality, cardinality and conservation of number. When counting do not always start at 1 and support conceptual understanding with different representations of the numbers. • Number bonds within ten, for example, identifying all the ways of making 6 (using the part-whole model to represent this) • Double and half of numbers within 10 Shape and Pattern: • Name 2-D and 3-D shapes Measures: • Comparison and ordering of capacities, lengths and weights Time: • O'clock and half past times • Begin to measure and record the time Money: • Recognition of all coins and £5 and £10 notes

Spring	Number: • Number bonds to and within 10 with part-whole representation • Using inverse to find missing numbers in equations • Applying known calculation strategies in addition and subtraction • Recognising patterns that increase and decrease in steps of 2, 5 and 10 • Half and double within 20 • Grouping and sharing within 20 Measures: • Comparison and ordering of containers using vocabulary: full, empty, more than, less than, half full, quarter full Time: • Tell the time one or two hours before and after a time • Match activities to different times of the day Money: • Recognition of all coins and notes
Summer	Number: • Addition and subtraction within 20, drawing attention to strategies (e.g. Make 10, counting on) and structures (e.g. 'first, then, now', combining or partitioning sets, finding difference). • Partitioning 2-digit numbers into tens and ones • Exploring repeated addition and the part-whole model and how it links with multiplication and division Shape and Pattern: • Use mathematical language to describe size and position using vocabulary whole, half, quarter, three quarter turns, clockwise and anti-clockwise • Identify and describe 2-D and 3-D shapes using vocabulary side, edge, face and vertices

Term	Year 2
Autumn	Number: • Count on and back in 2s, 3s, 5s and 10 from any number within 100 along a number line (vertical and horizontal) • Recognise the place value of each digit in a 2-digit number (tens, ones) • Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • Add and subtract tens and ones to 1 and 2-digit numbers within 100 (no regrouping) Shape and Pattern: • Use vocabulary related to shape accurately including the number of sides, edges, vertices and faces on 2-D and 3-D shapes • Describe position, direction and movement, including whole and half turns (clockwise and anti- clockwise) Measures: • Introduce cm as a standard unit for length (and continue to use m) • Compare the length of objects using cm and m Time: • Tell the time to the hour and half past Money: • Coin recognition of all coins and notes (£5, £10, £20) • Use £ and p symbols Data: • Interpret tables and scaled pictograms, block diagrams and simple graphs

Spring	Number: • Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • Add and subtract tens and ones to 1 and 2-digit numbers within 100 (with regrouping) • Find unit and non-unit fractions (halves, thirds and quarters) of quantity and recognise that one half is equal to two quarters • Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables Shape and Pattern: • Identify and describe the properties of 2-D and 3-D shapes including number of sides and line symmetry (2-D) and number of edges, vertices and faces (3-D) • Describe position, direction and movement, including whole, half, quarter and three- quarter turns (clockwise and anti-clockwise) • Copy, continue and make patterns by colour, size and shape • Order and arrange combinations of mathematical objects in patterns and sequences Time: • Tell the time to the nearest five minutes and quarter past and to the hour • Relate the multiplication table of 5 to the divisions on the clock face. Money: • Solve simple problems involving the addition and subtraction of money of the same unit, including giving change
Summer	Number: • Place value of numbers within 1000 • Complete addition or subtraction calculations using a range of strategies and deciding which is the most efficient • Use the inverse operations to solve missing number problems Measures: • Introduce standard units for mass (kg, g) and capacity (ml, L) and use these standard units when comparing and ordering mass and capacity • Practise reading sequences scaled in steps of 2, 5 and 10 and use known facts to derive reading scales in 20s, 50s and 100s. • Reading temperature on a thermometer • Estimate and calculate capacity, length and weight using standard units Shape and space: • Identify right angles in relation to shapes and everyday objects and in relation to quarter turns • Identify 2-D shapes on the surface of 3-D shapes • Identify and describe the properties of common 2-D shapes including the number of sides and line symmetry in a vertical line • Identify and describe the properties of common 3-D shapes including the number of edges, vertices and sides Time: • Calculating time intervals and durations

Term	Year 3
Autumn	Number: • Consolidate mental addition and subtraction for 2-digit numbers (with and without regrouping) using a range of calculation strategies • Represent numbers to 1000 with concrete manipulatives and images, including number lines • Place value of digits in numbers with up to three digits • Derive multiplication and division equations using arrays (multiples of 2, 5 & 10) • Recognise, find and write fractions of lengths, shapes and quantities • Choose and discuss efficient calculation strategies for 3-digit addition and subtraction, emphasising using number bonds / make ten • Derive facts from known facts 'If I know..., what else do I know?' (number bonds) • Doubles & halves (continue throughout the year) Shape and Pattern: • Name and describe 2-D and 3-D shapes according to their properties • Describe position, direction and movement in terms of straight line movements and rotations including angles • Identify horizontal and vertical lines Measures: • Read scales with intervals of 2, 5, 10 and 100 (comparing to increments of 1) Time: • Tell the time to the nearest five minutes Money: • Coin recognition of all coins and notes (£5, £10, £20)
Spring	Number: • Recognise that two halves/three thirds/four quarters are equal to one whole • Count in halves, thirds and quarters within 10 • Choose and justify efficient calculation strategies for age-appropriate calculations • Derive facts from known facts (multiplication / division and addition / subtraction) • Introduce counting in tenths during Unit 9 • Multiply by 10 and 100 recognising the importance of place value • Doubles & halves Data: • Read scales in steps of 2, 3, 4, 5 and 10 Shape and measure: • Identify right angles and that two right angles make a half turn • Calculate the perimeter of simple 2-D shapes Time: • Tell the time to the nearest minute • Tell the time from an analogue clock using Roman numbers I to XII

Summer	Number: • Recognise equivalent fractions using a fraction wall • Count in halves, thirds, quarters and tenths from any number • Find fractions (thirds, halves and quarters) of simple amounts (linked to division) • Multiplication and division by 10 and 100 • Choose efficient calculation strategies for age-appropriate calculations • Derive new facts from known number facts (all four operations) • Given a number, pupils identify calculations (from all four operations) that could result in that number. Data: • Read scales in steps of 2, 3, 4, 5, 10, 50 and 100 • Interpret tallies, tables, bar charts and pictograms Measures: • Read scales with intervals of 2, 5, 10, 25, 50, 100, 250 and 500 Shape and pattern: • Identify pairs of perpendicular and parallel lines Money: • Recognise British coins and notes and use in practical contexts

Term	Year 4
Autumn	Number: • Count in multiples of 6, 8, 25, 100 and 1000 • Using the multiplication tables up to 12 × 12 • Roman numerals to 100 (I to C) • Derive facts from known facts (number bonds and multiplication facts, using knowledge of place value, inverse relationship, commutativity etc.) 'If I know..., what else do I know?' using all four operations • Add and subtract 3-digit numbers mentally using a range of calculation strategies • Calculate multiplications and divisions mentally using a range of strategies (including known facts, halving, doubling, applying place value, inverse, commutativity etc). • Compare and order fractions • Find fractions of simple amounts and quantities (linking this to division) • Count in tenths and hundredths forwards and backwards Shape and Pattern: • Recognise 3-D shapes in different orientations and describe their properties • Identify right angles, compare angles and classify angles as acute or obtuse • Recognise quarter, half, three-quarter and whole turns and their equivalent number of right angles • Identify lines of symmetry in the surrounding environment and regular 2-D shapes • Identify horizontal and vertical lines and pairs of perpendicular and parallel lines Time: • Tell and write the time from an analogue clock, including Roman numerals from I to XII and 12-hour and 24-hour clocks • Estimate and read the time to the nearest minute Money: • Add and subtract money, including mixed units, and give change in practical contexts

Spring	Number: • Divide by ten and 100 (using knowledge of place value) to get a decimal fraction • Use the number line to represent numbers (including decimals), fractions (including mixed numbers) and measures • Recognise and use factor pairs and commutativity in mental calculations • Multiply three numbers together Geometry and shape: • Calculate the perimeters of rectilinear 2-D shapes on cm grids • Identify lines of symmetry in 2-D shapes Measures including money: • Solve problems, including missing number problems using number facts, place value and more complex addition and subtraction problems • Add and subtract money, including mixed units, and give change in practical contexts Time: • Estimate and read time to the nearest minute • Compare time in terms of seconds, minutes and hours • Convert units of time e.g. minutes to seconds, weeks to days
Summer	Number: • Identify the place value of the digits in a number with up to two decimal places • Suggest a decimal fraction that is equivalent to a fraction in tenths or 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 • Add and subtract 4-digit numbers mentally using a range of calculation strategies Geometry, position and direction: • Use flags to identify angles, shapes, symmetry, parallel and perpendicular lines • Describe positions on a 2-D grid as coordinates in the first quadrant Measures: • Recognise and write decimal equivalents to one quarter, one half and three quarters in the context of capacity, length and mass • Recognise centimetres written in metres; ml written in litres • Round lengths to the nearest metre Money: • Recognise how many ten pence pieces equal one pound, how many one pence pieces equal one pound and relate them to tenths and hundredths of a pound • Compare amounts of money up to two decimal places Time: • Look at timetables using correct vocabulary e.g. arrive / depart, first, last.

	Year 5	
	Objective	**Suggested Activities**
Autumn Term	**Count in multiples of 6, 7, 9, 25, 50, 100 and 1000**	**Count in steps of…**Should be done at least once a week throughout the year. Use a counting stick as a prompt to count in multiples forwards and backwards, selecting 1-2 each Maths Meeting.
	Know the number of days in each month, year and leap year	**Calendar Maths:** Explore today's date or a birthday in the class, you may wish to refer to a physical or digital calendar. Discuss what the day will be in x days time, how many days in the month and year.
	Identifying the value of 4,5 and 6 digit numbers	**Number of the week:** Explore a 4-digit number (could be selected by a pupil), read it out loud as a class, pupils explore the value of specific digits. E.g. What's the value of this digit and how do you know? The value of the digit is 400 because the digit 4 is in the hundreds column representing 4 hundreds. Over time you could build other activities such as 1000 more/less, double/half the number.

		Secret Number: Describe a number with some information on the value of the digits, pupils find all the possibilities.
	Count back past zero to include negative numbers using a number line	**Negative number line:** Use a pictorial or concrete vertical number line that ranges e.g. from -20 to 20. Count vertically up and down the number line and pose questions e.g. How do you know what one more than -3 is? Simon thinks that 0 is two more than -3 is he correct?
	Round any number to the nearest 10, 100 or 1000	**Ping Pong:** One partner says a two-digit number, the other rounds to the nearest multiple of ten. See how many you can do in one minute then swap. Can be adapted to larger numbers and other powers of ten.
	Recognise Roman numerals up to 100	**Ancient code:** What number is being shown on the Roman Artefacts? Pupils convert to our number system.
	Recalling and using multiplication facts up to 12 x 12	**Ping Pong:** Display one/two multiplication table(s) on the board/display pupils ask their partner multiplication tables from that fact and see how many they can do in one minute before swapping.
	Add, subtract, multiply and divide numbers mentally with increasingly large numbers, drawing upon known facts	**How many ways:** Give pupils the answer e.g. 330. How many ways can you create using one/two operations? **If I know then I know:** what other facts can we derive based upon this fact? **Double bubble** – Pupils double the numbers displayed and are given time to discuss their strategy.
	Compare and order fractions	**Would you rather:** E.g. 1/3 of a pizza or 1/6? Convince me!
	Recognise and show, using diagrams, families of common equivalent fractions	**Equivalents**: How many fractions can you find that are equivalent to e.g. 1/2
	Identify and describe the properties of 3-D shapes and 2-D shapes including classifying quadrilaterals and triangles	**I'm thinking of a shape**: Teacher/pupils think about a shape and pupils try to guess the shape with a minimal amount of yes/no questions. E.g. Does it have a right angle? Is it a quadrilateral?
	Convert between different units of metric measure (cm/mm, cm/m, kg/g, km/m, l/ml)	**Convert it:** Pupils convert metric measures.
	Tell the time to the nearest minute with analogue and digital clocks and 12-hour and 24-hour notation	**What's the time?** Pupils read the time on the class clock/clock displayed on the whiteboard. Pupils should be exposed to both analogue and digital clocks in different formats including ones that use Roman numerals. Over time further questions can be added e.g. what will the time be in 15 minutes?
	Solve problems involving converting between units of time from hours to minutes; minutes to seconds; years to months; weeks to days	**Convert it:** Pupils convert units of time.
	Measure and calculate the perimeter of a rectilinear shape (including squares) in cm and m	**Perimeter challenge**: Pupils are given a shape with a given perimeter, pupils to work out the length of the side.
	Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs	**Guess the graph:** Pupils are shown a graph without a title, pupils discuss what it could be showing and what trends they can see. Y5 pupils may want to look at bar graph and move onto other graphs including line graphs once the Y5 unit has been completed.

	Objective	Suggested Activities
Spring Term	**Count in multiples of 6, 7, 9, 25, 50, powers of ten (including tenths and hundredths)**	**Count in steps of…**Should be done at least once a week throughout the year. Use a counting stick as a prompt to count in multiples forwards and backwards, selecting 1-2 each Maths Meeting.
	Interpret negative numbers in context and calculate intervals across zero	**What's the temperature?** Display a thermometer and explain that temperature has dropped or has risen by **x.** Pupils record the change in temperature that includes working below zero.
	Identify the place value in a number with up to three decimal places	**Secret number:** Describe a number by identifying the value of some digits including tenths, hundredths and thousandths. Pupils to find all the possibilities (within a set number of decimal places).
	Add, subtract, multiply and divide numbers mentally with increasingly large numbers, drawing upon known facts	**How many ways:** Give pupils the answer e.g. 330. How many ways can you create using one/two operations? **If I know then I know:** what other facts can we derive based upon this fact?

		Double bubble – Pupils double the numbers displayed and are given time to discuss their strategy.
	Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	**Missing number:** Pupils find one unknown value using addition and subtraction. Over time, you may want to include examples where there are multiple possibilities.
	Recalling and using multiplication facts up to 12 x 12	**Ping Pong:** Display one/two multiplication table(s) on the board/display pupils ask their partner multiplication tables from that fact and see how many they can do in one minute before swapping.
	Identify multiples and factors, including finding all factor pairs and common factors of two numbers	**True or False:** Convince me if the statement e.g. "7 is a multiple of 14" is correct or not. **Factor challenge:** Can you find all factors of a given number?
	Recognise and show, using diagrams, families of common equivalent fractions	**Equivalents**: How many fractions can you find that are equivalent to e.g. ½.
	Read decimal numbers as fractions	**Equivalents: See activity above.** How many fractions and decimals can you find that are equivalent to a given fraction/decimal.
	Read, order and compare numbers with up to three decimal places	**Play your cards right (higher or lower):** Use the IWB or a pack of decimal cards to guess whether the next number is higher or lower than the original.
	Compare and order fractions, including mixed number and improper fractions whose denominators are multiples of the same number	**Would you rather:** E.g. 1 1/3 of a pizza or 5/3? Convince me!
	Recognise and show, using diagrams, families of common equivalent fractions	**Equivalents**: How many fractions can you find that are equivalent to e.g. 1/2
	Estimate and compare acute and obtuse angles	**Acute Angle?** Pupils convince you that the angle is acute or obtuse, explaining their reasons. (used to consolidate before the Y5 angles unit). **Guess the angle size:** Pupils estimate the size of the angle, closest wins! (Start this activity after pupils have explored angles in lessons)
	Read and convert time between analogue, digital, 12- and 24-hour clock	**What's the time?** Read the clock and then convert it into a 12/24 hour clock. Show/draw what the time would look like on your analogue clock/digital clock.
	Estimate, compare and calculate different measures, including money in pounds and pence	**Approximations:** Match the item to the most appropriate measurement **Shopping Challenge:** Total the amounts and decide how to pay using notes/coins
	Solve comparison, sum and difference problems using information presented in line graphs	**Guess the graph:** Pupils are shown a line graph without a title, pupils discuss what it could be showing and what trends they can see.
	Identify 3-D shapes, including cubes and other cuboids, from 2-D representations	**Nets**: Pupils are shown a net and will discuss the 3-D shape and explain their reasons.

	Objective	Suggested Activities
Summer Term	**Count in multiples of 6, 7, 9, 25, 50, powers of ten (including tenths and hundredths)**	**Count in steps of…**Should be done at least once a week throughout the year. Use a counting stick as a prompt to count in multiples forwards and backwards, selecting 1-2 each Maths Meeting.
	Round any number to the nearest 10, 100 or 1000	**Ping Pong:** One partner says a four-digit number, the other rounds to the nearest multiple of ten/hundred or thousand. See how many you can do in one minute then swap.
	Round decimals with one decimal place to the nearest whole number	**Ping Pong:** One partner says a number with one decimal place, the other rounds to the nearest whole number.
	Recognise Roman numerals up to 1000 (M)	**Ancient code:** What number is being shown on the Roman Artefacts? Pupils convert to our number system.

	Add, subtract, multiply and divide numbers mentally with increasingly large numbers, drawing upon known facts	**How many ways:** Give pupils the answer e.g. 330. How many ways can you create using one/two operations? **If I know then I know:** what other facts can we derive based upon this fact?
	Recalling and using multiplication facts up to 12 x 12	**Fizz buzz:** Pick two times tables, go around the room and count when you get to the first multiple a pupil says fizz, when you get to the second a pupil says buzz. For numbers that are multiples of both you say fizzbuzz. **Ping Pong:** Display one/two multiplication table(s) on the board/display pupils ask their partner multiplication tables from that fact and see how many they can do in one minute before swapping.
	Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	**Function machines:** Pupils are given the input and a function and need to identify the output using multiplication. Over time pupils work backwards applying division.
	Establish whether a number up to 100 is prime and recall prime numbers up to 19	**Fizz buzz:** Adapt fizz buzz above, to use prime numbers as a rule **True or False:** Pupils convince you if a number is prime or not. **Count in primes:** Go around the room in consecutive prime numbers, see what the highest number you can reach is.
	Recognise and use square numbers and cube numbers, and the notation for squared and cubed	**True or False:** Pupils convince you if a number is a square or cube number. **Spot the mistake:** Look at the Venn Diagram, which have been sorted incorrectly.
	Use all four operations to solve problems involving measure, using decimal notation	**Shopping Challenge, change edition:** Give pupils multiple items to buy from a list and a given note/coin. How much change was given?
	Write percentages as a fraction and as a decimal number	**Equivalents**: How many fractions and decimals can you find that are equivalent to e.g. 25% **Would you rather:** Compare a fraction with a decimal and/or percentage
	Solve problems involving converting between units of time	**Convert it:** Pupils convert units of time.
	Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints	**Convert it:** Pupils convert between different units of measure including imperial units.
	Estimate and compare acute, obtuse and reflex angles	**Guess the angle size:** Pupils estimate the size of the angle, closest wins! (Start this activity after pupils have explored angles in lessons)
	Compare durations of events [for example to calculate the time taken by particular events or tasks]	**Are we there yet?** Give pupils the start time and end time of two car journeys, which took the longest? You could vary by giving the start time and duration and ask pupils to work out the end time.
	Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes	**Spot the mistake:** Look at the Venn Diagram, which have been sorted incorrectly. **Triangle Puzzle:** Describe the properties of a triangle, pupils agree or disagree whether the triangle is possible or not.
	Describe movements between positions as translations of a given unit to the left/right and up/down	**Spot the mistake:** Pupils identify an error after a translation

	Year 6	
	Objective	**Suggested Activities**
Autu	**Count in multiples of 7, 9, 25, 50, 100 and 1000**	**Count in steps of…**Should be done at least once a week throughout the year. Use a counting stick as a prompt to count in multiples forwards and backwards, selecting 1-2 each Maths Meeting.

	Recalling and using multiplication facts up to 12 x 12	**Fizz buzz:** Pick two times tables, go around the room and count when you get to the first multiple a pupil says fizz, when you get to the second a pupil says buzz. For numbers that are multiples of both you say fizzbuzz. **Ping Pong:** Display one/two multiplication table(s) on the board/display pupils ask their partner multiplication tables from that fact and see how many they can do in one minute before swapping.
	Identifying the value of 4, 5 and 6 digit numbers	**Place Value Battle:** In pairs pupils have a 4-digit place value chart. Partner A rolls a dice (or use digit cards) and decides where to place it, then this is repeated in turns. Largest value wins! **Secret Number**: Describe a 5/6 digit number with some information on the value of the digits, pupils find all the possibilities.
	Round any number to the nearest 10, 100 or 1000	**Ping Pong:** One partner says a two-digit number, the other rounds to the nearest multiple of ten. See how many you can do in one minute then swap. Can be adapted to larger numbers and other powers of ten.
	Establish whether a number up to 100 is prime and recall prime numbers up to 19	**Fizz buzz:** Adapt fizz buzz above, to use prime numbers as a rule **True or False:** Pupils convince you if a number is prime or not. **Count in primes:** Go around the room in consecutive prime numbers, see what the highest number you can reach is.
	Recognise Roman numerals up to 1000	**Ancient code:** What number is being shown on the Roman Artefacts? Pupils convert to our number system.
	Identify the place value in a number with up to three decimal places	**Place value battle:** decimals (see above) **Play your cards right (higher or lower):** Use the IWB or a pack of decimal cards to guess whether the next number is higher or lower than the original.
	Add, subtract, multiply and divide numbers mentally with increasingly large numbers, drawing upon known facts	**How many ways:** Give pupils a calculation, ask them to list different strategies they could use. **If I know then I know:** what other facts can we derive based upon this fact? **Double bubble** – Pupils double the numbers displayed and are given time to discuss their strategy.
	Compare and order fractions	**Would you rather:** E.g. 1/3 of a pizza or 1/6? Convince me!
	Recognise and show, using diagrams, families of common equivalent fractions	**Equivalents**: How many fractions can you find that are equivalent to e.g. ½.
	Read decimal numbers as fractions	**Equivalents:** See activity above. How many fractions and decimals can you find that are equivalent to a given fraction/decimal.
	Convert between different units of metric measure (cm/mm, cm/m, kg/g, km/m, l/ml)	**Convert it:** Pupils convert metric measures.
	Solve problems involving converting between units of time from hours to minutes; minutes to seconds; years to months; weeks to days	**Convert it:** Pupils convert units of time.
	Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes (include language of regular and irregular)	**Spot the mistake:** Look at the Venn Diagram, which have been sorted incorrectly. **Triangle Puzzle:** Describe the properties of a triangle, pupils agree or disagree whether the triangle is possible or not.
	Estimate and compare acute, obtuse and reflex angles	**Guess the angle size:** Pupils estimate the size of the angle, closest wins! (Start this activity after pupils have explored angles in lessons)
	Identify 3-D shapes, including cubes and other cuboids, from 2-D representations	**Nets**: Pupils are shown a net and will discuss the 3-D shape and explain their reasons.
	Solve comparison, sum and difference problems using information presented in line graphs	**Guess the graph:** Pupils are shown a line graph without a title, pupils discuss what it could be showing and what trends they can see.

Objective	Suggested Activities
Count in multiples of 6, 7, 9, 25, 50 and powers of ten (including tenths and hundredths)	Count in steps of…Should be done at least once a week throughout the year. Use a counting stick as a prompt to count in multiples forwards and backwards, selecting 1-2 each Maths Meeting.
Interpret negative numbers in context and calculate intervals across zero	What's the temperature? Display a thermometer and explain that temperature has dropped or has risen by x. Pupils record the change in temperature that includes working below zero.
Round decimals with two decimal places to the nearest whole number and to one decimal place	Ping Pong: One partner says a number with two decimal places e.g. 12.26, the other rounds to the nearest whole number. See how many you can do in one minute then swap.
Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	Function machines: Pupils are given the input and a function and need to identify the output using multiplication. Over time pupils work backwards applying division.
Add, subtract, multiply and divide numbers mentally with increasingly large numbers, drawing upon known facts	How many ways: Give pupils the answer e.g. 330. How many ways can you create using one/two operations? If I know then I know: what other facts can we derive based upon this fact?
Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	Missing number: Pupils find one unknown value using addition and subtraction. Over time, you may want to include examples where there are multiple possibilities.
Recalling and using multiplication facts up to 12 x 12	Ping Pong: Display one/two multiplication table(s) on the board/display pupils ask their partner multiplication tables from that fact and see how many they can do in one minute before swapping.
Identify multiples and factors, including finding all factor pairs and common factors of two numbers	True or False: Convince me if the statement e.g. "7 is a multiple of 14" is correct or not. Factor challenge: Can you find all factors of a given number?
Measure and calculate the perimeter of a rectilinear shape (including squares) in cm and m	Perimeter challenge: Pupils are given a shape with a given perimeter, pupils to work out the length of the side.
Read, order and compare numbers with up to three decimal places	Play your cards right (higher or lower): Use the IWB or a pack of decimal cards to guess whether the next number is higher or lower than the original.
Compare and order fractions, including mixed number and	Would you rather: E.g. 1 1/3 of a pizza or 5/3? Convince me!

	improper fractions whose denominators are multiples of the same number	
	Write percentages as a fraction and as a decimal number	**Equivalents: How many fractions and decimals can you find that are equivalent to e.g. 25%** **Would you rather: Compare a fraction with a decimal and/or percentage**
	Solve problems involving the calculation **of percentages and the use of percentages for comparison**	**How many ways: Give pupils a percentage problem and discuss different strategies that could be used to work it out with a partner before sharing.**
	Recognise and use square numbers and cube numbers, and the notation for squared and cubed	**True or False: Pupils convince you if a number is a square or cube number.** **Spot the mistake: Look at the Venn Diagram, which have been sorted incorrectly.**
	Understand and use approximate equivalences between metric units and **common imperial units such as inches, pounds and pints**	**Convert it: Pupils convert between different units of measure including imperial units.**
	Identify, describe and represent the position of a shape following a reflection or translation	**Spot the mistake: Pupils identify an error after a translation**
	Estimate and compare acute, obtuse and reflex angles	**Guess the angle size: Pupils estimate the size of the angle, closest wins! (Start this activity after pupils have explored angles in lessons)**
	Complete, read and interpret information in tables, including timetables	**Which bus? Display a bus timetable and scenario. Pupils reason in pairs around which bus to take and why**

	Objective	Suggested Activities
Summer Term	**Count in forwards and backwards in powers of ten for any given number to 1,000,000**	**Count in steps of…**Should be done at least once a week throughout the year. Use a counting stick as a prompt to count in multiples forwards and backwards, selecting 1-2 each Maths Meeting.
	Recalling and using multiplication facts up to 12 x 12	**Fizz buzz:** Pick two times tables, go around the room and count. When you get to the first multiple a pupil says fizz, when you get to the second a pupil says buzz. "Fizzbuzz" for both.
	Identify the place value in a number with up to three decimal places	**Place Value Battle: Apply battle game to decimals (see Autumn)** **Play your cards right (higher or lower):** Pupils guess whether next number will be higher or lower.
	Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	**Function machines:** Pupils are given the input and a function and need to identify the output using multiplication. Over time pupils work backwards applying division.
	Use their knowledge of the order of operations to carry out calculations involving the four operations	**True or false:** Convince your partner if the answer is correct, applying what you know around order of operations

	Calculate and compare the area of rectangles (including squares) using cm² and m²	**Draw it:** The teacher gives pupils an area. Pupils draw a shape on their whiteboard that has the given area.
	Compare and order fractions, including mixed number and improper fractions	**Would you rather:** E.g. 1 1/3 of a pizza or 5/3? Convince me!
	Solve problems involving the calculation of percentages	**How many ways:** Give pupils a percentage problem and discuss different strategies that could be used to work it out with a partner before sharing.
	Use common factors to simplify fractions; use common multiples to express fractions in the same denomination	**Simplest form:** Express the fraction using the lowest possible denominator
	Recall and use equivalences between simple fractions, decimals and percentages	**Equivalents**: How many fractions and decimals can you find that are equivalent to e.g. 25%
	Understand and use approximate equivalences between metric units and common imperial units	**Convert it:** Pupils convert between different units of measure including imperial units.
	Estimate, compare and calculate different measures	**Approximations:** Match the item to the most appropriate measurement
	Use all four operations to solve problems involving measure, using decimal notation	**Shopping Challenge:** Total the amounts and decide how to pay using notes/coins **Shopping Challenge, change edition:** Give pupils multiple items to buy from a list and a given note/coin. How much change was given?
	Describe positions on the full coordinate grid (all four quadrants)	**Coordinates:** Display a full coordinates grid on the IWB. One pupil comes up to the IWB to plot a given coordinate. Other pupils guide them to translating or reflecting in from a given instruction.
	Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles	**Find x:** Pupils find the missing angle, labelled x on a straight line, right angle or full turn.
	Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius	**Radius or diameter?** Show pupils a circle with the radius or diameter labelled. Ask pupils to tell you a sentence about it e.g. The radius is 4cm. Pupils then double or half the amount to find the other. E.g. The diameter is 8 cm.
	Calculate and interpret the mean as an average	**Find the mean:** Pupils use mental calculation to find the mean of three/four 1 digit numbers (all calculations will have no remainder). E.g. 3, 4, 8 – the mean is 15/3 = 8.
	Interpret Pie charts	**What is known?** Write a list of all you know about the chart
	Use simple formulae	**Find x:** Pupils solve simple equations with one unknown. Over time you may want to introduce two unknowns.
	Generate and describe linear number sequences	**Sequence of the day: W**hat is the term to term rule, what would be the next terms?

Arithmetic

At Richmond Hill, we place a strong emphasis on arithmetic as a key pillar of our mathematics curriculum. Arithmetic—the ability to perform basic mathematical operations such as addition, subtraction, multiplication, and division—forms the foundation for more advanced mathematical learning. Achieving fluency in arithmetic is crucial because it enables pupils to solve problems efficiently, accurately, and with confidence.

Fluency in arithmetic allows pupils to move beyond rote learning and gain a deeper understanding of the relationships between numbers. When pupils have a strong grasp of arithmetic, they are able to approach more complex mathematical concepts—such as fractions, decimals, percentages, and algebra—with greater ease, as these concepts often build directly on the foundational skills learned through arithmetic.

Regular practice of arithmetic ensures that pupils can perform calculations quickly and accurately, which is essential not only in mathematics lessons but also in everyday life. For example, being able to calculate prices, measure ingredients in cooking, or manage money all require a solid understanding of basic arithmetic.

At Richmond Hill, we strive to ensure that all pupils develop a deep fluency in arithmetic, providing them with the tools they need to succeed both within and beyond the classroom. This fluency enables them to tackle more complex problems with confidence, making them more resilient and capable mathematicians as they progress through their education.

To support this, each year group from Year 1 to Year 6 has dedicated arithmetic sessions. Similarly to maths meetings, teachers are expected to tailor their arithmetic sessions based on the needs of the class, prioritising key strands of knowledge that need consolidation, while also incorporating current learning where necessary.

Times Tables

At Richmond Hill, we recognise the vital role that times tables play in developing pupils' fluency in mathematics. Mastery of times tables is essential, as it forms the foundation for a wide range of mathematical concepts. The ability to quickly recall multiplication facts allows pupils to solve more complex problems efficiently, aiding in their overall mathematical development. Times tables not only support operations such as multiplication and division but also underpin areas like fractions, percentages, and algebra, making them a crucial component of the curriculum.

By ensuring that pupils have a solid understanding of times tables, we empower them to approach mathematical problems with confidence and independence. Regular practice and recall of times tables contribute to improved number sense and provide the fluency required to solve problems accurately and with speed. This fluency is critical for success in both everyday life and more advanced mathematical study, fostering a sense of achievement and confidence in pupils.

To further support the explicit teaching of times tables through curriculum implementation, we use **Times Tables Rock Stars (TTRS**) from Year 4 and beyond. This engaging online platform provides a fun, interactive way for pupils to practice and reinforce their multiplication and division facts. TTRS allows pupils to work at their own pace, progressing through various levels as they build confidence and accuracy in recalling times tables.

The platform combines music, games, and competition to create an exciting and motivating environment for pupils. By encouraging a 'rock star' mentality, TTRS helps to keep pupils engaged and eager to improve their skills. It offers a range of features, including individual progress tracking, which allows teachers to monitor each pupil's development and provide targeted support where needed.

Regular use of TTRS at school, alongside independent practice at home, enables pupils to achieve fluency in their times tables, supporting their overall mathematical journey. Through this interactive approach, pupils not only develop accuracy and speed in recalling times tables but also gain the confidence to tackle more challenging mathematical tasks with ease.