

Mathematics Curriculum



Assessment

Unit Plan and Delivery

Knowledge Organisers

Pre Assessment Tasks

Stretton St Matthew's
C.E. Primary School

Mathematics Curriculum Intent and Vision

"Pure mathematics is in its way, the poetry of logical ideas."
- Albert Einstein.

At St Matthew's, we believe that all children can, and will, succeed in mathematics. Mathematics teaches us how to make sense of the world around us through developing a child's ability to calculate, to reason and to solve problems. Mathematicians are able to reason, explain, work systematically and apply their mathematical knowledge to a range of situations and problems. It enables children to understand and appreciate relationships and patterns in both number and space in their everyday lives.

We encourage pupils to have a positive attitude to maths and we work hard to ensure they develop strong mathematical skills and knowledge. We develop a culture where children persevere and are resilient when they are faced with challenging mathematical concepts. We foster positive can do attitudes and we promote the fact that 'We can all do maths!' We believe all children can achieve in mathematics, and teach for secure and deep understanding of mathematical concepts through manageable steps.

At St Matthew's, we follow a mastery approach for the teaching of Mathematics to develop children's understanding and reasoning on a deeper level. Through our involvement with the North West Maths Hub, senior leaders and teachers have worked together to create a bespoke, carefully sequenced, lesson design to ensure a consistent learning journey throughout school. Children are taught through whole-class interactive teaching, where the focus is on all children working together on the same lesson content whilst at the same time, challenging and supporting pupils to gain depth of understanding and proficiency.

Our whole school curriculum is shaped by our school vision which aims to enable all children, regardless of background, ability or additional needs, to flourish and to become the very best version of themselves. We teach the National Curriculum, supported by a clear skills and knowledge progression. This ensures that skills and knowledge are built on year by year and sequenced appropriately to maximise learning for all children.

Our units of work are planned based on the National Curriculum Programmes of Study and content is delivered in small, manageable steps. In addition, we use NCETM materials to further enhance our curriculum to ensure that we deliver ambitious and progressive lessons. Children are challenged through careful questioning and supported through the use of concrete materials and visual representations to develop a deep conceptual understanding.

We ensure that before moving to the next step, all children can master concepts. Our pupils are expected to reason and clearly explain their thinking using mathematical vocabulary to explain why an answer is correct or incorrect. Knowledge organisers are used within each unit of work to give pupils the 'bigger picture' of specific mathematical concepts, support their learning and enable them to make links to previous work.

Children who are finding it difficult to grasp concepts access further adult support to ensure that all children are maintaining progress. We also utilise our more able learners as coaches within lessons to develop their ability to explain their reasoning and to provide support for peers. We identify misconceptions as starting places for concept building and use this to respond to the needs of each pupil, allowing additional time before moving on.

Mathematics: National Curriculum

Programmes of Study

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

- Become **fluent** in the fundamentals of mathematics, including the varied and regular practice of increasingly complex problems over time.
- **Reason mathematically** by following a line of enquiry, understanding relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- Can **solve problems** by applying their mathematics to a variety of problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

The National Curriculum describes what must be taught in each key stage. We have a set of key objectives to follow in Mathematics that provide detailed guidance for the implementation of the National Curriculum for Maths. This ensures continuity and progression in the teaching of maths. In Reception, maths learning follows the Early Years Foundation Stages Framework. Children are given opportunities to extend their understanding of language learning through play and investigation, developing their characteristics of learning.

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

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress will always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly will be challenged through being offered rich and sophisticated problems before any acceleration through new content.

Those who are not sufficiently fluent with earlier material will consolidate their understanding, including additional practice through small focus group work or 1:1 interventions, before moving on.

Mathematics Lesson Design

Teachers design lessons following our whole school bespoke lesson design so that there is a carefully sequenced journey through the concept being taught, identifying difficult points and possible misconceptions.

Children are challenged through careful questioning and supported through the use of concrete materials and visual representations to develop a deep conceptual understanding. We follow the National Curriculum enhanced with NCETM and White Rose Maths materials to deliver our progressive and ambitious Maths curriculum.

Our children are all taught through a concrete, pictorial, abstract approach to Maths based on Jerome Bruner's work, pupils learn new concepts initially using concrete examples, such as counters, then progress to drawing pictorial representations before finally using more abstract symbols, such as the equals sign.

Children who are finding it difficult to grasp concepts access further adult coaching sessions to ensure that all children are maintaining progress. We also utilise our more able learners as coaches within lessons to develop their ability to explain their reasoning and to provide support for peers. We identify misconceptions as starting places for concept building and use this to respond to the needs of each pupil, allowing additional time before moving on.

Do Now



New Learning



Let's Explore



Teach



Independent Tasks



Cheeky Challenge



Growth Mindset

Teachers reinforce an expectation that all pupils are capable of achieving high standards in mathematics. Lessons are carefully planned and resourced, using a range of concrete, pictorial and abstract resources, to foster deep conceptual and procedural knowledge.

We understand the vital role practice and consolidation play in enabling children to gain a deeper understanding of mathematical concepts and children are given the opportunity to develop their fluency, reasoning and problem solving skills.

Developing the language of mathematics is an essential aspect of teaching mathematics, therefore teachers use precise questioning in class to test conceptual and procedural knowledge, and children are expected to use correct mathematical vocabulary within lessons.

How is Maths taught across Key Stages?

As outlined in the [national curriculum](#), children in primary school develop their understanding of the fundamentals of mathematics and build their knowledge of addition, subtraction, multiplication and division throughout KS1 and KS2.

EYFS

Children have regular daily whole class mathematics inputs, where the focus is on developing mental maths skills, concentrating on numbers between 1 and 20. The initial part of the EYFS is centred around counting and ordering numbers, matching amounts to quantities and ensuring children are accurate in their counting and are using strategies to help them. Regular small group adult-led sessions are taught in mathematics. In addition to the more formal taught sessions, children are encouraged to explore number and shape and space through continuous provision activities, which are planned to develop children's understanding of key mathematical concepts. By the end of the year, children are expected to be able to count to 20, to be able to say what is one more and one less than a given number, to be able to add or subtract single digit numbers and to solve problems, including doubling, halving and sharing.

Key Stage 1

The principal focus of mathematics teaching in Key Stage 1 is to ensure that children develop confidence and mental fluency with whole numbers, counting and place value. This involves working with numerals, words and the four operations, including with practical resources (e.g. concrete objects and measuring tools). At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency. Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

Lower Key Stage 2

The principal focus of mathematics teaching in lower Key Stage 2 is to ensure that children become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that children develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. At this stage, pupils should develop their ability to solve a range of problems, including simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.

By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work. Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

Upper Key Stage 2

The principal focus of mathematics teaching in upper Key Stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio. At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

By the end of year 6, pupils should be fluent in written methods for all 4 operations, including long multiplication and division, and in working with fractions, decimals and percentages. Pupils should read, spell and pronounce mathematical vocabulary correctly.

Mathematics Assessment

At St Matthew's, we use a variety of assessment in order to ensure the progress of all pupils is at its highest. With regards to our formative assessment methods, we have a vigorous system in place which enables us to know exactly where our pupils are in terms of mathematical understanding.

This subsequently allows us to address possible misconceptions through different interventions and perhaps most importantly, it is also used to inform our planning for that unit of mathematics.

Ways we ensure the progress of all pupils/assess:

- Teachers review pupils' work on a daily basis to identify any pupils who need same day intervention and to inform planning. Assessment is against the key constructs.
- End of units assessments are used throughout the year to identify gaps.

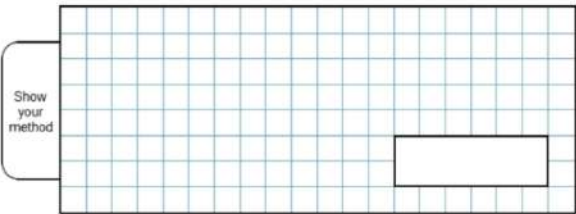
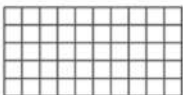
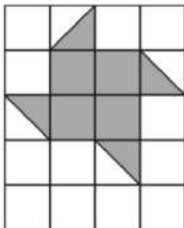
- Pre-Assessment Tasks/Pre-Learning to begin each unit of work used to see what the children already know and remember from previous year groups. Pre-Assessment Tasks allow teachers to be able to plan confidently from the children's correct starting point and identify any gap.
- NCETM Assessment / I See Reasoning materials.
- Retrieval activities to recap prior learning and to interpret the forgetting curve e.g. White Rose Flashback 4 questions.
- NFER assessment papers – termly. (Y2/Y6 previous SATS assessments).

Pre-Assessment Task Examples:

Year 2 Pre-Assessment: Addition and Subtraction

Task 1 Write the missing phrase. less than greater than equal to 9 + 3 is _____ 6 + 7 11 + 2 is _____ 9 + 3 6 + 7 is _____ 11 + 2	Task 2 Work out the additions. a) 7 + 3 + 5 c) 6 + 6 + 4 b) 8 + 9 + 1 d) 9 + 3 + 7 a) b) c) d)
Task 3 Complete the sentences. a) 10 more than 13 is c) 10 more than is 60 b) 10 less than 81 is d) 10 less than is 87	Task 4 Work out the additions. a) 295 + 6 b) 662 + 8 a) b)

Y6 Pre-assessment Task: Percentages

Task 1 What percentage of each bar model is shaded?  %  %	Task 2 20% of Megan's number is 64 What is 50% of Megan's number? Show your method 
Task 3 a) Shade the grid in the given proportions. • $\frac{3}{5}$ green • 14% red • $\frac{4}{20}$ blue • the rest yellow  b) What percentage of the grid is yellow?	Task 4 Here is a grid of 20 squares.  What percentage of the grid is shaded?

Y3 Pre-Assessment Task: Measurement

1.

Which unit of measurement is the best to measure a 5p coin?

millimetres centimetres metres

2.

How long is the crayon?

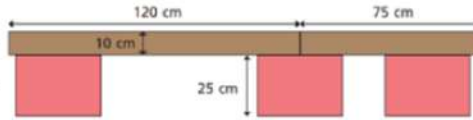


3.

Complete the sentence.

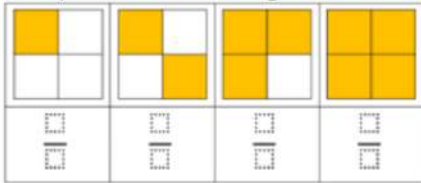
_____ centimetres = 1 metre

4.

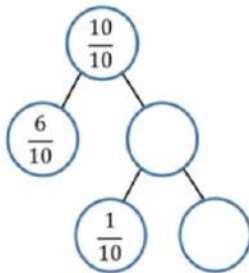


- a) What is the total length of his bridge?
b) What is the height of his bridge?

Complete the missing information



Fill in the missing values.
Explain how you got your answers.



Complete the sentences to describe the apples.



of the apples are red.

of the apples are green.

and make one whole

Complete the table.

Image	Words	Fraction	Decimal
	One tenth	$\frac{1}{10}$	0.1
	Nine tenths		

Year 5 Pre-Assessment: Number – Place Value

Task 1

What numbers are represented?



Task 2

Mo is trying to make the number 3,250

He represents it on a place value chart.

Th	H	T	O

Is Mo correct?

How do you know?

Task 3

Round each number to the nearest 100



b) 712

c)

H	T	O

Task 4



Put the house prices in order from least expensive to most expensive.

Maths Fluency: Key Instant Recall Facts (KIRFs)

What is Fluency in Maths?

Fluency in maths is about developing number sense and being able to use the most appropriate method for the task at hand; to be able to apply a skill to multiple contexts. The National Curriculum states that pupils should **become fluent in the fundamentals of mathematics through varied and frequent practice**. While a part of this is about knowing key mathematical facts and recalling them efficiently, fluency means so much more than this as it allows pupils to delve much deeper.

How Does Mathematical Fluency Fit with Reasoning and Problem Solving?

The mastery curriculum for primary schools places problem solving at the heart of mathematics with the main aim that every child can learn to solve multi-step word problems in an unfamiliar context. To enable them to achieve this, pupils must develop their conceptual understanding, mathematical thinking and use of mathematical language. This is where fluency and reasoning come in.

How Fluency And Reasoning Work In Primary Maths

Fluency in maths works through intelligent practice (rather than just mechanical repetition). Once a child has grasped a mathematical concept, the idea is that they are exposed to varied fluency activities which develop their understanding. These activities also require them to use verbal reasoning to justify and explain their thinking in order to solve word problems in an unfamiliar context.

Key Instant Recall Facts (KIRF)

KIRF's - What are they?

KIRFs is a whole-school program for raising standards in Maths. KIRFs (Key Instant Recall Facts) are designed to support the development of the mental skills that underpin much of the maths work in schools. They are particularly useful when calculating, be it adding, subtracting, multiplying or dividing.

An important part of maths development has always been rote learning of certain numeracy facts. For many years this has included practising times tables. However, alongside times tables there are many other key number facts that knowledge of makes undertaking complex reasoning and problem solving much more accessible.

Each half term children will be given Key Instant Recall Facts (KIRFs) to practise and learn at home as well as the work in school. These are sent home on A4 sheets and include practical ideas to assist children in grasping the key facts. It is important that they know these thoroughly and can recall specific facts instantly. Whilst children have a wide range of abilities in mathematics, the KIRFs are designed to be a set of facts that need to be learnt thoroughly as they build on each other year on year. The overall aim is for the children to know their KIRF inside out, back to front and with instant recall.

By internalising these key facts which have been carefully structured to build upon each other term by term, year by year, children will leave Stretton St Matthew's with a much stronger foundation of mathematical understanding to build upon.



Maths Fluency: Key Instant Recall Facts – Whole School Overview

By the end of each half term, children should know the following facts. The aim is for them to recall these facts instantly.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS	I can say the numbers from 0 to 5 and back from 5 to 0 in order.	I can say the numbers from 0 to 10 and back from 10 to 0 in order.	I can partition numbers, to 5, into two groups.	I can say the days of the week in order.	I can count, read and write numbers to 20	I can use physical representations to add and subtract.
Year 1	Read and write numbers 1-10 in numerals and words.	I know number bonds for each number to 6.	I know doubles and halves of numbers to 10.	I know number bonds to 10.	I can tell the time (nearest hour/half hour)	I know number bonds for each number to 10.
Year 2	I know number bonds to 20	I know the x and ÷ facts for the 2 times table.	I know doubles and halves of numbers to 20.	I know the x and ÷ facts for the 10 times table.	I can tell the time. (nearest hour/half hour/quarter hour/five minutes)	I know the x and ÷ facts for the 5 times table.
Year 3	I know number bonds for all numbers to 20.	I know the x and ÷ facts for the 3 times table.	I can recall facts about durations of time.	I know the multiplication and division facts for the 4 times table.	I can tell the time. (nearest hour/half hour/quarter hour/five minutes/minute)	I know the x and ÷ facts for the 8 times table.
Year 4	I know number bonds to 100.	I know the x and ÷ facts for the 6 times table.	I know the x and ÷ facts for the 9 and 11 times tables	I can recognise decimal equivalents of fractions.	I know the x and ÷ facts for the 7 times table.	I can x and ÷ single-digit numbers by 10 and 100.
Year 5	I know decimal number bonds to 1 and 10.	I know the x and ÷ facts for all times tables up to 12×12 .	I can recall metric conversions.	I can identify prime numbers up to 20.	I can recall square numbers up to 122 and their square roots.	I can find factor pairs of a number
Year 6	I know the x and ÷ facts for all times tables up to 12×12	I can identify common factors of a pair of numbers.	I can convert between decimals, fractions and percentages.	I can identify prime numbers up to 50.		

EYFS Long Term Planning



Stretton St Matthew's
C.E. Primary School

Mathematics
Count objects, actions and sounds.
Subitise.
Link the number symbol (numeral) with its cardinal number value.
Count beyond ten.
Compare numbers.
Understand the 'one more than/one less than' relationship between consecutive numbers.
Explore the composition of numbers to 10.
Automatically recall number bonds for numbers 0-5 and some to 10.
Select, rotate and manipulate shapes to develop spatial reasoning skills.
Compose and decompose shapes so that children recognise a shape can have other shapes <i>within it</i>, just as numbers can.
Continue, copy and create repeating patterns.
Compare length, weight and capacity.

Early Learning Goals:

Mathematics
Number
- Have a deep understanding of number to 10, including the composition of each number. - Subitise (recognise quantities without counting) up to 5. - Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.
Numerical Patterns
- Verbally count beyond 20, recognising the pattern of the counting system. - Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity. - Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

EYFS Early Learning Goals / Prior Knowledge

Development Matters Non-Statutory Curriculum Guidance for the Early Years Foundation

Stage pages 88-92:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1007446/6.7534_DfE_Development_Matters_Report_and_illustrations_web_2_.pdf

Prior Learning/Knowledge:

Children at the expected level (three to four years) of development will:

- Develop fast recognition of up to 3 objects, without having to count them individually ('subitising')
- Recite numbers past 5
- Say one number for each item in order: 1,2,3,4,5
- Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle')
- Show 'finger numbers' up to 5
- Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5
- Experiment with their own symbols and marks as well as numerals
- Solve real world mathematical problems with numbers up to 5
- Compare quantities using language: 'more than', 'fewer than'
- Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'
- Understand position through words alone - for example, "The bag is under the table," - with no pointing
- Describe a familiar route
- Discuss routes and locations, using words like 'in front of' and 'behind'
- Make comparisons between objects relating to size, length, weight and capacity
- Select shapes appropriately: flat surfaces for building, a triangular prism for a roof, etc.
- Combine shapes to make new ones - an arch, a bigger triangle, etc.
- Talk about and identify the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs', etc.
- Extend and create ABAB patterns - stick, leaf, stick, leaf
- Notice and correct an error in a repeating pattern
- Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn term	Getting to know you		Match, sort and compare Free trial VIEW	Talk about measure and patterns VIEW	It's me 1, 2, 3 VIEW				Circles and tri... VIEW	1, 2, 3, 4, 5 VIEW		Shapes with 4 ... VIEW
Spring term	Alive in 5 VIEW	Mass and capa... VIEW	Growing 6, 7, 8 VIEW	Length, height and time VIEW				Building 9 and 10 VIEW			Explore 3-D shapes VIEW	
Summer term	To 20 and beyond VIEW	How many now? VIEW	Manipulate, compose and decompose VIEW	Sharing and grouping VIEW				Visualise, build and map VIEW			Make connecti... VIEW	Consolidation

Autumn Long Term Planning Y1-Y6



Stretton St Matthew's
C.E. Primary School

Year 1: Small Steps to Mastery and Substantive Knowledge

Year 1 AUTUMN Term

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	
Number: Place Value (within 10) White Rose Small Steps: 15 1. Sort objects 2. Count objects 3. Count objects from a larger group 4. Represent objects 5. Recognise numbers as words 6. Count on from any number 7. One more 8. Count backwards within 10 9. One less 10. Compare groups by matching 11. Fewer, more, same 12. Less than, greater than, equal to 13. Compare numbers 14. Order objects and numbers 15. The number line <u>Substantive Knowledge</u> • RTP: NPV1 Count within 100, forwards and backwards, starting with any number. • RTP: NPV2 Reason about the location of numbers to 20 within the linear number system, including comparing using < > and = • NC: Count to 10 forwards and backwards beginning with 0 or 1 or from any given number • NC: Count, read and write numerals to 10 in numerals and words • NC: Given a number, identify one more or one less • NC: Identify and represent numbers using objects and pictorial representation including a number line and use the language of equal to, more than, less than, (fewer) most, least					Number: Addition and Subtraction (within 10) White Rose Small Steps: 17 1. Introduce parts and wholes 2. Part-whole model 3. Write number sentences 4. Fact families – addition facts 5. Number bonds to 10 6. Systematic number bonds within 10 7. Number bonds to 10 8. Addition – adding together 9. Addition – adding more 10. Addition problems 11. Find a part 12. Subtraction – find a part 13. Fact families – the 8 facts 14. Subtraction – take away/cross out (How many left?) 15. Takeaway – how many left? 16. Subtraction on a number line 17. Add or subtract 1 or 2 <u>Substantive Knowledge</u> • RTP: NF1 Develop fluency in addition and subtraction facts within 10. • RTP: AS1 Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers. • RTP: AS2 Read, write and interpret equations containing addition (+), subtraction (-) and equals (=) symbols, and relate additive expressions and equations to real-life contexts • NC: Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs • NC: Represent and use number bonds and related subtraction facts within 10					Geometry: Shape White Rose Small Steps: 5 1. Recognise and name 3-D shapes 2. Sort 3-D shapes 3. Recognise and name 2-D shapes 4. Sort 2-D shapes 5. Patterns with 3-D and 2-D shapes <u>Substantive Knowledge</u> • RTP: G1 Recognise common 2D and 3D shapes presented in different orientations, and know that rectangles, triangles, cuboids and pyramids are not always similar to one another. • NC: Recognise and name common 2-D and 3-D shapes, including: 2-D shapes [for example, rectangles (including squares), circles and triangles] • NC: Recognise and name common 3-D shapes [for example,		CONSOLIDATION

<u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.1 Comparison of quantities/measures 1.3 Composition of numbers 1-5 1.4 1.4 Composition of numbers 6-10	• NC: Add and subtract one-digit numbers to 10 including 0 • NC: Solve one step problems that involve addition and subtraction using concrete objects and pictorial representation and missing number problems <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.2 'Whole' and 'Parts': part-part-whole 1.5 Introduction to aggregation and partitioning 1.6 Introduction to augmentation and reduction 1.7 Addition and Subtraction: Strategies within 10	cuboids (including cubes), pyramids and spheres]. <u>NCETM PD Materials</u> N/A	
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Year 2: Small Steps to Mastery and Substantive Knowledge

Year 2 AUTUMN Term

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Number: Place Value White Rose Small Steps: 16 - Numbers to 20 - Count objects to 100 by making 10s - Recognise tens and ones - Use a place value chart - Partition numbers to 100 - Write numbers to 100 in words - Flexibly partition numbers to 100 - Write numbers to 100 in expanded form 10s on the number line to 100 10s and 1s on the number line to 100 - Estimate numbers on a number line - Compare objects - Compare numbers - Order objects and numbers - Count in 2s, 5s and 10s - Count in 3s <u>Substantive Knowledge</u> • RTP: NPV1 Recognise place value of each digit in 2 digit numbers; compose and decompose 2 digit numbers (standard + non- standard partitioning) • RTP: NPV2 Reason about the location of any 2 digit number, including identifying the previous and next multiple of 10. • NC: Read and write numbers to at least 100 in numerals and in words • NC: Identify, represent and estimate numbers using different representations, including the number line • NC: Compare and order numbers from 0 up to 100; use and = signs				Number: Addition and Subtraction White Rose Small Steps: 21 - Bonds to 10 - Fact families – addition and subtraction bonds within 20 - Related facts - Bonds to 100 (tens) - Add and subtract 1a - Add by making 10 - Add three 1-digit numbers - Add to the next 10 - Add across a 10 - Subtract across 10 - Subtract from a 10 - Subtract a 1-digit number from a 2-digit number (across 10) 10 more, 10 less - Add and subtract 10s - Add two 2-digit numbers (not across 10) - Add two 2-digit numbers (across a 10) - Subtract two 2-digit numbers (not across 10) - Subtract two 2-digit numbers (across a 10) - Mixed addition and subtraction - Compare number sentences - Missing number problems <u>Substantive Knowledge</u> • RTP: NF1 Secure fluency in addition and subtraction facts within 10, through continued practice. • RTP: AS1 Add and subtract across 10. • RTP: AS2 Recognise the subtraction structure of 'difference' (How many more...?) • RTP: AS3 and AS4 Add and subtract within 100: add and subtract only ones or only tens to/from a two- digit number and add and subtract any 2 two- digit numbers.					Geometry: Properties of Shape White Rose Small Steps: 12 - Recognise 2D and 3D shapes - Count sides on 2D shapes - Count vertices on 2D shapes - Draw 2D shapes - Lines of symmetry on shapes - Use lines of symmetry to complete shapes - Sort 2-D shapes - Count faces on 3d shapes - Count edges on 3D shapes - Count vertices on 3D shapes - Sort 3D shapes - Make patterns with 3D shapes <u>Substantive Knowledge</u> • RTP: G1 Use precise language to describe the properties of 2D and 3D shapes, and compare shapes by reasoning about similarities and differences in properties. • NC: identify and describe the properties of 2D shapes, including the number of sides and line symmetry in a vertical line • NC: identify and describe the properties of 3D shapes, including the number of edges, vertices and faces • NC: identify 2D shapes on the surface of 3D shapes • NC: compare and sort common 2-D and 3D shapes and everyday objects.		

• NC: Count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward • NC: Use place value and number facts to solve problems. • NC: Recognise the place value of each digit in a 2-digit number (tens & ones) <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.9 Composition of numbers: 20-100 <i>(Revisit Y1 Place Value to 100)</i> Spine 2: Multiplication and Division 2.1 Counting, unitising and coins (Count in 2s, 5s, 10s)	• NC: Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • NC: Add and subtract numbers using various representations mentally, including: a two-digit and 1s, a two-digit and 10s, 2 two-digit numbers, 3 one-digit numbers • NC: Show that addition of 2 numbers is commutative and subtraction of one number from another is not • NC: Recognise and use the inverse relationship between addition and subtraction (use to check and solve missing number problems) • NC: Solve problems with addition and subtraction using representations, applying their increasing knowledge of mental and written methods <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.2 'Whole' and 'Parts': part-part-whole 1.7 Addition and Subtraction: Strategies within 10 1.8 Composition of numbers: multiples of 10 up to 100 1.9 Composition of numbers: 20-100 (TP 6) 1.11 Addition and subtraction: bridging 10 1.13 Addition and subtraction: two-digit and single-digit numbers 1.14 Addition and subtraction: two-digit numbers and multiples of 10 1.16 Subtraction: two-digit and two-digit numbers Spine 2: Multiplication and Division 2.1 Counting, unitising and coins (TP 2)	<u>NCETM PD Materials</u> Spine 3: Fractions 3.0 Guidance on the teaching of fractions in Key Stage 1
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Year 3: Small Steps to Mastery and Substantive Knowledge

Year 3 AUTUMN Term

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Number: Place Value White Rose Small Steps: 14 1. Represent numbers to 100 (R) 2. Partition numbers to 100 3. Number line to 100 4. Hundreds 5. Represent numbers to 1,000 6. Partition numbers to 1000 7. Flexible partitioning of numbers to 1000 8. 100s, 10s and 1s 9. Find 1, 10, 100 more or less than a given number 10. Number line to 1,000 11. Estimate on a number line to 1000 12. Compare numbers to 1,000 13. Order numbers Count in 50s 14. Count in 50s <u>Substantive Knowledge</u> • NPV1 Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three-digit multiples of 10. • NPV2 Recognise the place value of each digit in three-digit numbers, and compose and decompose three-digit numbers using standard and nonstandard partitioning. • NPV3 Reason about the location of any three- digit number in the linear number system, including identifying the previous and next multiple of 100 and 10.			Number: Addition and Subtraction White Rose Small Steps: 22 1. Apply number bonds within 10 2. Add and subtract 1s 3. Add and subtract 10s 4. Add and subtract 100s 5. Spot the pattern 6. Add 1s across 10 7. Add 10s across 100 8. Subtract 1s across a 10 9. Subtract 10s across 100 10. Make connections 11. Add two numbers (no exchange) 12. Subtract two numbers (no exchange) 13. Add two numbers (across a 10) 14. Add two numbers (across a 100) 15. Subtract two numbers (across a 10) 16. Subtract two numbers (across a 100) 17. Add 2-digit and 3-digit numbers 18. Subtract a 2-digit number from a 3-digit number 19. Complements to 100 20. Estimate answers 21. Inverse operations 22. Make decisions <u>Substantive Knowledge</u> • AS1 Calculate complements to 100, for example: $46 + ? = 100$ • AS2 Add and subtract up to three-digit numbers using columnar methods. • AS3 Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction, and how both relate to the part-part-whole structure. Understand				Number: Multiplication and Division White Rose Small Steps: 15 1. Multiplication – equal groups 2. Using arrays 3. Multiplies of 2 4. Multiples of 5 and 10 5. Sharing and grouping 6. Multiply by 3 7. Divide by 3 8. The 3 times table 9. Multiply by 4 10. Divide by 4 11. The 4 times-table 12. Multiply by 8 13. Divide by 8 14. The 8 times-table 15. The 2, 4 and 8 times-tables <u>Substantive Knowledge</u> • MD1 Apply known multiplication and division facts to solve contextual problems with different structures, including quotitive and partitive division. • NF2 Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number • NF3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10). • NPV1 Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three- digit multiples of 10.				

• NPV4 Divide 100 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal parts. • NC: Recognise the place value of each digit in a three-digit number • NC: Identify, represent and estimate using different representations • NC: Find 10 or 100 more or less than a given number • NC: Compare and order numbers up to 1000 • NC: Solve number problems and practical problems involving these ideas • NC: Count from 0 in multiples of 4, 8, 50 and 100 <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.17 Composition and calculation: 100 and bridging 100 (TP 1) 1.18 Composition and calculation: three-digit numbers (TP 2-4)	and use the commutative property of addition, and understand the related property for subtraction. • NF1 Secure fluency in addition and subtraction facts that bridge 10, through continued practice. • NF3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10). • NC: Add and subtract numbers mentally including: 3 digits and ones, 3 digits and tens, 3 digits and hundreds. • NC: Add and subtract numbers with up to 3 digits using formal written methods of columnar addition and subtraction • NC: Estimate the answer to a calculation and use inverse operations to check answers • NC: Solve problems, including missing numbers, using number facts, place value and more complex addition and subtraction. <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.17 Composition and calculation: 100 and bridging 100 1.18 Composition and calculation: three-digit numbers (TP 5) 1.20 Algorithms: column addition 1.21 Algorithms: column subtraction	• NC: Count from 0 in multiples of 4, 8, 50 and 100 • NC: Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables. • NC: Write and calculate multiplication and division statements for the tables known including 2 digits times 1-digit numbers using mental and formal written methods • NC: Solve problems, including missing numbers involving multiplication and division. • NC: Solve problems including positive integer scaling and correspondence problems in which n objects are connected to m objects <u>NCETM PD Materials</u> Spine 2: Multiplication and Division 2.6 Structures and quotitive and partitive division 2.7 Times tables: 2, 4 and 8, and the relationship between them 2.8 Times tables: 3, 6 and 9, and the relationship between them (TP 1)
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Year 4: Small Steps to Mastery and Substantive Knowledge

Year 4 AUTUMN Term

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	
Number: Place Value White Rose Small Steps: 17 1. Represent numbers to 1000 2. Partition numbers to 1000 3. Number line to 1000 4. Thousands 5. Represent numbers to 10,000 6. Partition numbers to 10,000 7. Flexible partitioning of numbers to 10,000 8. Find 1, 10, 100, 1000 more or less 9. Number line to 10,000 10. Estimate on a number line to 10,000 11. Compare numbers to 10,000 12. Order numbers to 10,000 13. Roman numerals 14. Round to the nearest 10 15. Round to the nearest 100 16. Round to the nearest 1000 17. Round to the nearest 10, 100 or 1000 <u>Substantive Knowledge</u> • NPV1 Know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100; apply this to identify and work out how many 100s there are in other four-digit multiples of 100. • NPV2 Recognise the place value of each digit in four-digit numbers, and compose and decompose four-digit numbers using standard and non- standard partitioning. • NPV3 Reason about the location of any four-digit number in the linear number system, including identifying the previous and next multiple of 1,000 and 100 (AND 10), and rounding to the nearest of each				Number: Addition and Subtraction White Rose Small Steps: 10 1. Add and subtract 1s, 10s, 100s and 1000s 2. Add up to two 4-digit numbers - no exchange 3. Add two 4-digit numbers - one exchange 4. Add two 4-digit numbers - more than one exchange 5. Subtract two 4-digit numbers - no exchange 6. Subtract two 4-digit numbers - one exchange 7. Subtract two 4-digit numbers - more than one exchange 8. Efficient subtraction 9. Estimate answers 10. Checking strategies <u>Substantive Knowledge</u> • NF3 Apply place-value knowledge to known additive facts (scaling facts by 100) • NC: Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate • NC: Estimate and use inverse operations to check answers to a calculation			Measurement: Area White Rose Small Steps: 4 1. What is area? 2. Count squares 3. Make shapes 4. Compare area <u>Substantive Knowledge</u> • NC: Find the area of rectilinear shapes by counting squares <u>NCETM PD Materials</u> N/A	Number: Multiplication and Division White Rose Small Steps: 13 1. Multiplies of 3 2. Multiply and divide by 6 3. 6 times-table and division facts 4. Multiply and divide by 9 5. 9 times-table and division facts 6. The 3, 6 and 9 times-tables 7. Multiply and divide by 7 8. 7 times-table and division facts 9. 11 times-table and division facts 10. 12 times-table and division facts 11. Multiply and divide by 1 and 0 12. Divide a number by 1 and itself 13. Multiply three numbers <u>Substantive Knowledge</u> • NF1 Recall multiplication and division facts up to 12x12 and recognise products in multiplication tables as multiples of the corresponding number. • NF3 Apply place-value knowledge to known multiplicative number facts (scaling facts by 100) • MD1 Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size. • MD2 Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication.				CONSOLIDATION

• NC: Count in multiples of 6, 7, 9, 25 and 1000 • NC: Find 1000 more or less than a given number • NC: Recognise the place value of each digit in a 4-digit number • NC: Order and compare numbers beyond 1000 • NC: Identify, represent and estimate numbers using different representations • NC: Round any number to the nearest 10, 100 and 1000 • NC: Count backwards through zero to negative numbers • NC: Solve number and practical problems will all of the above. <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.17 Composition and calculation: 100 and bridging 100 1.22 Composition and calculation: 1000 and four-digit numbers 1.27 Negative numbers: counting, comparing and calculating	• NC: Solve addition and subtraction twostep problems in contexts, deciding which operations and methods to use and why <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.20 Algorithms: column addition 1.21 Algorithms: column subtraction 1.22 Composition and calculation: 1000 and four-digit numbers (TP 3)		• NC: Recall multiplication and division facts for multiplication tables up to 12 X 12 • NC: Count in multiples of 6, 7, 9, 25 and 1000 • NC: Use place value, known and derived facts to multiply and divide mentally, including multiplying by 0 and 1, dividing by 1 • NC: Multiplying together 3 numbers • NC: Solve problems involving multiplying and adding including using the distributive law to multiply 2-digit numbers by 1 digit; integer scaling problems and correspondence problems such as n objects are connected to m objects <u>NCETM PD Materials</u> Spine 2: Multiplication and Division 2.6 Structures and quotitive and partitive division (TP 5) 2.8 Times tables: 3, 6 and 9, and the relationship between them 2.9 Times tables: 7 and patterns within/across times tables 2.13 Calculation: multiplying and dividing by 10 or 100
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Year 5: Small Steps to Mastery and Substantive Knowledge

Year 5 AUTUMN Term

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	
Number: Place Value White Rose Small Steps: 14 1. Roman Numerals to 1,000 2. Numbers to 10,000 3. Numbers to 100,000 4. Numbers to 1,000,000 5. Read and write numbers to 1,000,000 6. Powers of 10 7. 10, 100, 1000, 10,000, 100,000 more or less 8. Partition numbers to 1,000,000 9. Number line to 1,000,000 10. Compare and order numbers to 100,000 11. Compare and order numbers to 1,000,000 12. Compare and order numbers to 100,000 13. Round within 100,000 14. Round within 1,000,000 <u>Substantive Knowledge</u> • NPV2 Recognise the place value of each digit in numbers with up to 2 decimal places, and compose and decompose numbers with up to 2 decimal places using standard and non-standard partitioning. • NPV3 Reason about the location of any number with up to 2 decimals places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each.			Number: Addition and Subtraction White Rose Small Steps: 8 1. Mental strategies 2. Add whole numbers with more than four digits 3. Subtract whole numbers with more than four digits 4. Round to check answers 5. Inverse operations (+ and -) 6. Multi-step addition and subtraction problems 7. Compare calculations 8. Find missing numbers <u>Substantive Knowledge</u> • NF2 Apply place-value knowledge to known additive facts • NC: Add and subtract whole numbers with more than 4 digits, including using formal		Number: Multiplication and Division White Rose Small Steps: 10 1. Multiples 2. Commons multiplies 3. Factors 4. Common factors 5. Prime numbers 6. Square numbers 7. Cube numbers 8. Multiply by 10, 100 and 1,000 9. Divide by 10, 100 and 1,000 10. Multiples of 10, 100 and 1,000 <u>Substantive Knowledge</u> • MD1 Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size. • MD2 Find factors and multiples of positive integers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors. • NC: Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers • NC: Establish whether a number up to 100 is prime; recall prime numbers to 19			Number: Fractions A White Rose Small Steps: 17 1. Find fractions equivalent to a unit fraction 2. Find fractions equivalent to a non-unit fraction 3. Recognise equivalent fractions 4. Convert improper fractions to mixed numbers 5. Convert mixed numbers to improper fractions 6. Compare fractions less than 1 7. Order fractions less than 1 8. Compare and order fractions greater than 1 9. Add and subtract fractions with the same denominator 10. Add fractions within 1 11. Add fractions with a total greater than 1 12. Add to a mixed number 13. Add two mixed numbers 14. Subtract fractions 15. Subtract from a mixed number 16. Subtract from a mixed number- breaking the whole 17. Subtract two mixed numbers <u>Substantive Knowledge</u> • 5F2 Find equivalent fractions and understand that they have the same value and the same position in the linear number system. • 5F1 Find non-unit fractions of quantities • NC: Add and subtract fractions with the same denominator and denominators that are multiples of the same number <u>NCETM PD Materials</u> Spine 3: Fractions 3.1 Preparing for fractions: the part-whole relationship				

• NC: Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit • NC: Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 • NC: Interpret negative numbers in context • NC: Count forwards and backwards with positive and negative whole numbers, including through 0 • NC: Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000 • NC: Solve number problems and practical problems that involve all of the above • NC: Read Roman numerals to 1,000 (M) and recognise years written in Roman numerals <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.26 Composition and calculation: Multiples of 1,000 up to 1,000,000 1.27 Negative numbers: counting, comparing and calculating	written methods (columnar) • NC: Add and subtract numbers mentally with increasingly large numbers • NC: Use rounding to check answers and determine, in context, levels of accuracy • NC: Solve + and - multi-step problems in contexts, deciding which operations and methods to use and why. <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.20 Algorithms: column addition 1.21 Algorithms: column subtraction 1.22 Composition and calculation: 1000 and four-digit numbers (TP 3 and TP 5) 1.28 Common structures and the part-part-whole relationship (Multi-step problems) 1.29 Using equivalence and the compensation property to calculate (TP 3 and 6)	• NC: Identify multiples and factors • NC: Multiply and divide numbers mentally drawing upon known facts • NC: Multiply and divide whole numbers by 10, 100 and 1000 • NC: Recognise and use square numbers and cube numbers, and the notation for squared (<i>e. g</i> 3^2 and 4^3) • NC: Find all factor pairs of a number and common factors of 2 numbers • NC: Solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes <u>NCETM PD Materials</u> Spine 2: Multiplication and Division 2.9 Times tables: 7 and patterns within/across times tables (square numbers) 2.13 Calculation: Multiplying and dividing by 10 or 100 2.18 Using equivalence to calculate 2.19 Calculation: $x \div$ fractions by whole numbers 2.20 Multiplication with three factors and volume (cube numbers) 2.21 Factors, multiples, prime numbers and composite numbers	3.2 Unit fractions: identifying, representing and comparing 3.3 Non unit fractions: identifying, representing and comparing 3.4 Adding and subtracting within one whole 3.5 Working across one whole: improper fractions and mixed numbers 3.6 Multiplying whole numbers and fractions 3.7 Finding equivalent fractions and simplifying fractions 3.8 Common denomination: more adding and subtracting
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Year 6: Small Steps to Mastery and Substantive Knowledge

Year 6 AUTUMN Term

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	
Number: Place Value White Rose Small Steps: 8 1. Numbers to 1,000,000 2. Numbers to 10,000,000 3. Read and write numbers to 10,000,000 4. Powers of 10 5. Number line to 10,000,000 6. Compare and order any integers 7. Round any integer 8. Negative numbers <u>Substantive Knowledge</u> • NPV2 Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and nonstandard partitioning. • NPV3 Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts. • NPV4 Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read		Number: Addition, Subtraction, Multiplication and Division (Four Operations) White Rose Small Steps: 17 1. Add and subtract integers 2. Common factors 3. Common multiples 4. Rules of divisibility 5. Primes to 100 6. Square and cube numbers 7. Multiply up to a 4-digit number by a 2-digit number 8. Solve problems with multiplication 9. Short division 10. Division using factors 11. Introduction to long division 12. Long division with remainders 13. Solve problems with division 14. Solve multi-step problems 15. Order of operations 16. Mental calculations and estimation 17. Reason from known facts <u>Substantive Knowledge</u> • AS/MD-1 Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number). • AS/MD2 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.					Number: Fractions A and B Fractions A White Rose Small Steps: 9 1. Equivalent fractions and simplifying 2. Equivalent fractions on a number line 3. Compare and order (denominator) 4. Compare and order (numerator) 5. Add and subtract simple fractions 6. Add and subtract any two fractions 7. Add mixed numbers 8. Subtract mixed numbers 9. Multi-step problems Fractions B White Rose Small Steps: 7 1. Multiply fractions by integers 2. Multiply fractions by fractions 3. Divide a fraction by an integer 4. Divide any fraction by any integer 5. Mixed questions with fractions 6. Fraction of an amount 7. Fraction of an amount – find the whole <u>Substantive Knowledge</u> • 6F-1 Recognise when fractions can be simplified, and use common factors to simplify fractions. • 6F-2 Express fractions in a common denomination and use this to compare fractions that are similar in value.				Measurement: Converting Units White Rose Small Steps: 5 1. Metric measures 2. Convert metric measures 3. Calculate with metric measures 4. Miles and kilometres 5. Imperial measures <u>Substantive Knowledge</u> • NC: Solve problems involving the calculation and conversion of units of measure, using decimal notation up to 2 decimal places where appropriate • NC: 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	

scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts. • NC: Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit • NC: Round any whole number to a require degree of accuracy • NC: Use negative numbers in context, and calculate intervals across 0 • NC: Solve number and practical problems that involve all of the above <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.26 Composition and calculation: Multiples of 1,000 up to 1,000,000 <i>*Revisit place value from Y5</i> 1.30 Composition and calculation: numbers up to 10,000,000 (TP 2, 3 and 5)	• NC: Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • NC: Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division • NC: Interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context • NC: 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 • NC: Perform mental calculations, including with mixed operations and large numbers. • NC: Identify common factors, common multiples and prime numbers • NC: Use their knowledge of the order of operations to carry out calculations involving the 4 operations • NC: Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why • NC: Solve problems involving addition, subtraction, multiplication and division • NC: Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.20 Algorithms: column addition 1.21 Algorithms: column subtraction <i>*Revisit for column methods</i> 1.30 Composition and calculation: numbers up to 10,000,000 (TP 2, 3 and 5) Spine 2: Multiplication and Division 2.9 Times tables: 7 and patterns within/across times tables (square numbers)	• 6F-3 Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy. • 6NPV-4 Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts. • NC: Use common factors to simplify fractions • NC: Use common multiples to express fractions in the same denomination • NC: Compare and order fractions, including fractions >1 • NC: Generate and describe linear number sequences (with fractions) • NC: Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions • NC: Multiply simple pairs of proper fractions, writing the answer in its simplest form • NC: Divide proper fractions by whole numbers • NC: Associate a fraction with division and calculate decimal fraction equivalents for a simple fraction. • NC: Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts <u>NCETM PD Materials</u> Spine 3: Fractions 3.5 Working across one whole: improper fractions and mixed numbers 3.7 Finding equivalent fractions and simplifying fractions 3.8 Common denomination: more adding and subtracting (TP 5)	to up to 3 decimal places • NC: Convert between miles and kilometres <u>NCETM PD Materials</u> Spine 2: Multiplication and Division 2.29 Decimal place value knowledge, multiplication and division
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	2.15 Division: partitioning leading to short division (if necessary) 2.20 Multiplication with three factors and volume (cube numbers) 2.21 Factors, multiples, prime numbers and composite numbers 2.22 Combining multiplication with addition and subtraction 2.23 Multiplication strategies for larger numbers and long multiplication 2.24 Division: dividing by two-digit divisors 2.25 Using compensation to calculate 2.28 Combining division with addition and subtraction	3.9 Multiplying fractions and dividing fractions by a whole number (TP 1 and 3)	
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Spring Long Term Planning Y1-Y6



Stretton St Matthew's
C.E. Primary School

Year 1: Small Steps to Mastery and Substantive Knowledge

Year 1 SPRING Term

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Number: Place Value (within 20) White Rose Small Steps: 12 - Count within 20 - Understand 10 - Understand 11, 12 and 13 - Understand 14, 15 and 16 - Understand 17, 18, 19 - Understand 20 1 more 1 less - The number line to 20 - Use a number line to 20 - Estimate on a number line to 20 - Compare numbers to 20 - Order numbers to 20 <u>Substantive Knowledge</u> - RTP: NPV1 Count within 100, forwards and backwards, starting with any number. - RTP: NPV2 Reason about the location of numbers to 20 within the linear number system, including comparing using < > and = - NC: Count to 20 forwards and backwards from any given number - NC: Count, read and write numbers to 20 in numerals and words - NC: Given a number identify one more or one less - NC: Identify and represent numbers using objects and pictorial			Number: Addition and Subtraction (within 20) White Rose Small Steps: 10 - Adding by counting on within 20 - Add ones using number bonds - Find and make number bonds to 20 - Doubles - Near doubles - Subtract ones using number bonds - Subtraction – counting back - Subtraction – finding the difference - Related facts - Missing number problems <u>Substantive Knowledge</u> - RTP: NF1 Develop fluency in addition and subtraction facts within 10. - RTP: AS1 Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers. - RTP: AS2 Read, write and interpret equations containing addition (+), subtraction (-) and equals (=) symbols, and relate additive expressions and equations to real-life contexts - NC: Represent and use number bonds and related subtraction facts within 20. - NC: Read, write and interpret mathematical statements involving addition, subtraction and equal signs - NC: Add and subtract one-digit numbers to 20 including 0 Solve one step problems			Number: Place Value (within 50) White Rose Small Steps: 8 - Counting from 20 to 50 20, 30, 40 and 50 - Count by making groups of tens - Groups of tens and ones - Partition into tens and ones - The number line to 50 - Estimate on a number line to 50 1 more, 1 less <u>Substantive Knowledge</u> - RTP: NPV1 Count within 100, forwards and backwards, starting with any number. - RTP: NF2 Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any multiple, and count forwards and backwards through the odd numbers. - NC: Count to 50 forwards and backwards beginning with 0 or 1 or from any given number - NC: Count, read and write numerals to 50 in numerals and words		Measurement: Length and Height White Rose Small Steps: 3 - Compare lengths and heights - Measure length using objects - Measure length in centimetres <u>Substantive Knowledge</u> - RTP: NPV2 Reason about the location of numbers to 20 within the linear number system, including comparing using < > and = - RTP: AS2 Read, write and interpret equations containing addition (+), subtraction (-) and equals (=) symbols, and relate additive expressions and equations to real-life contexts. - NC: Measure and begin to record mass/weight, capacity and volume - NC: Compare, describe and solve practical problems for mass/weight e.g. heavy/light, heavier than/lighter than, capacity and volume e.g. full/empty, more than/less than, half, half full, quarter		Measurement: Mass and Volume White Rose Small Steps: 7 - Heavier and lighter - Measure mass - Compare mass - Full and empty - Compare volume - Measure capacity - Compare capacity <u>Substantive Knowledge</u> - RTP: AS2 Read, write and interpret equations containing addition (+), subtraction (-) and equals (=) symbols, and relate additive expressions and equations to real-life contexts. - NC: Measure and begin to record mass/weight, capacity and volume - NC: Compare, describe and solve practical problems for mass/weight e.g. heavy/light, heavier than/lighter than, capacity and volume e.g. full/empty, more than/less than, half, half full, quarter	

representation including a number line and use the language of equal to, more than, less than, (fewer) most, least <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.10 Composition of numbers 11-19 (TP 1 and 2)	that involve addition and subtraction using concrete objects and pictorial 7=? -9 <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.2 'Whole' and 'Parts': part-part-whole 1.5 Introduction to aggregation and partitioning 1.6 Introduction to augmentation and reduction 1.7 Addition and Subtraction: Strategies within 10	• NC: Given a number, identify one more or one less • NC: Identify and represent numbers using objects and pictorial representation including a number line and use the language of equal to, more than, less than, (fewer) most, least • NC: Count in multiples of 2's, 5's and 10's <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.9 Composition of numbers: 20-100 Spine 2: Multiplication and Division 2.1 Counting, unitising and coins	• NC: Compare, describe and solve practical problems for lengths and heights e.g. long/short, longer/shorter, tall/short, double/half <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.1 Comparison of quantities/measures	<u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.1 Comparison of quantities/measures
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Year 2: Small Steps to Mastery and Substantive Knowledge

Year 2 SPRING Term

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Measurement: Money White Rose Small Steps: 10 1. Count money – pence 2. Count money – pounds (notes and coins) 3. Count money – pounds and pence 4. Choose notes and coins 5. Make the same amount 6. Compare amounts of money 7. Calculate with money 8. Make a pound 9. Find change 10. Two-step problems <u>Substantive Knowledge</u> • Continue to explore RTP: NPV2 and AS1 –AS4 • NC: Recognise and use symbols for pounds (£) and pence (p); • NC: Combine amounts to make a particular value. • NC: Find different combinations of coins that equal the same amounts of money. • NC: Solve simple problems in a practical context involving addition and subtraction of money of the		Number: Multiplication and Division White Rose Small Steps: 17 1. Recognise equal groups 2. Make equal groups 3. Add equal groups 4. Introduce the multiplication symbol 5. Multiplication sentences 6. Use arrays 7. Make equal groups – grouping 8. Make equal groups – sharing 9. The 2 times table 10. Divide by 2 11. Doubling and halving 12. Odd and even numbers 13. The 10 times table 14. Divide by 10 15. The 5 times table 16. Divide by 5 17. The 5 and 10 times tables <u>Substantive Knowledge</u> • NC: Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including odd and even numbers • NC: Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs • NC: Show that multiplication of 2 numbers is commutative and division is not • NC: Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.					Measurement: Length and Height White Rose Small Steps: 5 1. Measure in centimetres 2. Measure in metres 3. Compare lengths and heights 4. Order lengths and heights 5. Four operations with lengths and heights <u>Substantive Knowledge</u> • NC: Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); to the nearest appropriate unit using rulers (tape measure etc) • NC: Compare and order lengths, mass, volume/ capacity and record the results using >, < and = • NC: Use rulers, scales thermometers and measuring vessels to the nearest unit.		Measurement: Mass, Capacity and Temperature White Rose Small Steps: 9 1. Compare mass 2. Measure in grams 3. Measure in kilograms 4. Four operations with mass 5. Compare volume and capacity 6. Measure in millilitres 7. Measure in litres 8. Four operations with volume and capacity 9. Temperature <u>Substantive Knowledge</u> • NC: choose and use appropriate standard units for mass (kg/g); temperature (°C); capacity (litres/ml) use scales, thermometers and measuring vessels • NC: compare and order measures and record the results using >, < and = • NC: Use rulers, scales thermometers and measuring vessels to the nearest unit. <u>NCETM PD Materials</u> N/A		

same unit, including giving change <u>NCETM PD Materials</u> Spine 2: Multiplication and Division 2.1 Counting, unitising and coins (TP 4-6)	• RTP: MD1 Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2, 5 and 10 multiplication tables • RTP: MD2 Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotitive division). <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.4 Composition of numbers 6-10 (TP 3) 1.10 Composition of numbers: 11-19 Spine 2: Multiplication and Division 2.2 Structures: multiplication representing equal groups (TP1) 2.3 Times tables (2s) 2.4 Times tables (5s/10s) 2.5 Doubling and halving 2.6 Structures and quotitive and partitive division (TP 1-4)	<u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.1 Comparison of quantities/measures	
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Year 3: Small Steps to Mastery and Substantive Knowledge

Year 3 SPRING Term

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Number: Multiplication and Division B White Rose Small Steps: 11 1. Multiples of 10 2. Related calculations 3. Reasoning about multiplication 4. Multiply a 2-digit number by a 1-digit number – no exchange 5. Multiply a 2-digit number by a 1-digit number – with exchange 6. Link multiplication and division 7. Divide a 2-digit number by a 1-digit number – no exchange 8. Divide a 2-digit number by a 1-digit number – flexible partitioning 9. Divide a 2-digit number by a 1-digit number – with remainders 10. Scaling 11. How many ways? • MD1 Apply known multiplication and division facts to solve contextual problems with different structures, including quotitive and partitive division. • NF2 Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number • NF3 • NPV1 • NC: Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables			Measurement: Length and Perimeter White Rose Small Steps: 12 1. Measure in metres and centimetres 2. Measure in millimetres 3. Measure in centimetres and millimetres 4. Metres, centimetres and millimetres 5. Equivalent lengths (m and cm) 6. Equivalent lengths (cm and mm) 7. Compare lengths 8. Add lengths 9. Subtract lengths 10. What is perimeter? 11. Measure perimeter 12. Calculate perimeter <u>Substantive Knowledge</u> • NPV2, AS2 and NPV3 • NC: Measure, compare, add and subtract: lengths (m/cm/mm) • NC: Measure the perimeter of simple 2D shapes <u>NCETM PD Materials</u> Spine 2: Multiplication and Division 2.16 Multiplication contexts: area and perimeter (1) (TP 1 to introduce)			Number: Fractions A White Rose Small Steps: 10 1. Understand the denominators of unit fractions 2. Compare and order unit fractions 3. Understand the numerator of non-unit fractions 4. Understand the whole 5. Compare and order non-unit fractions 6. Fractions and scales 7. Fractions on a number line 8. Count in fractions on a number line 9. Equivalent fractions on a number line 10. Equivalent fractions as bar models <u>Substantive Knowledge</u> • F1 Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts (unit fractions and non-unit fractions with small denominators) • F2 Find unit fractions of quantities using known division facts (multiplication tables fluency). • F3 Reason about the location of any fraction within 1 in the linear number system. • F4 Add and subtract fractions with the same denominator, within 1. • NC: Count up and down in tenths • NC: Recognise that tenths arise from dividing an object into 10 equal parts			Measurement: Mass and Capacity White Rose Small Steps: 11 1. Use scales 2. Measure mass in grams 3. Measure mass in kilograms and grams 4. Equivalent masses (grams and kilograms) 5. Compare mass 6. Add and subtract mass 7. Measure capacity and volume in millilitres 8. Measure capacity and volume in litres and millilitres 9. Equivalent capacities and volumes (litres and millilitres) 10. Compare capacity and volume 11. Add and subtract capacity and volume <u>Substantive Knowledge</u> NC: Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) <u>NCETM PD Materials</u> N/A		

• NC: 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 • NC: Solve problems, including missing number problems, involving multiplication and division • NC: Solve problems including positive integer scaling and correspondence problems in which n objects are connected to m objects <u>NCETM PD Materials</u> Spine 2: Multiplication and Division 2.6 Structures and quotitive and partitive division (TP 4) 2.8 Times tables: 3, 6 and 9, and the relationship between them (TP 5) 2.13 Calculation: multiplying and dividing by 10 or 100 (TP 6) 2.14 Multiplication: partitioning leading to short multiplication (TP 1-2) 2.15 Division: partitioning leading to short division (TP 1) 2.17 Structures: using measures and comparison to understand scaling (TP 5) 2.19 Calculation: $\times/\div$ decimal fractions by whole numbers		and in dividing one-digit numbers or quantities by 10 • NC: Recognise and show, using diagrams, equivalent fractions with small denominators • NC: Compare and order unit fractions, and fractions with the same denominators • NC: Solve problems that involve all of the above <u>NCETM PD Materials</u> Spine 3: Fractions 3.3 Non unit fractions: identifying, representing and comparing 3.4 Adding and subtracting within one whole 3.7 Finding equivalent fractions and simplifying fractions (TP 1-2)	
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Year 4: Small Steps to Mastery and Substantive Knowledge

Year 4 SPRING Term

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Number: Multiplication and Division B White Rose Small Steps: 15 1. Factor pairs 2. Use factor pairs 3. Multiply by 10 4. Multiply by 100 5. Divide by 10 6. Divide by 100 7. Related facts – multiplication and division 8. Informal written methods for multiplication 9. Multiply a 2-digit number by a 1-digit number 10. Multiply a 3-digit number by a 1-digit number 11. Divide a 2-digit number by a 1-digit number (1) 12. Divide a 2-digit number by a 1-digit number (2) 13. Divide a 3-digit number by a 1-digit number 14. Correspondence problems 15. Efficient multiplication <u>Substantive Knowledge</u> • NF1 Recall multiplication and division facts up to 12x12 and recognise products in multiplication tables as multiples of the corresponding number. • NF3 Apply place-value knowledge to known multiplicative number facts (scaling facts by 100) • MD1 Multiply and divide whole numbers by 10 and 100 (keeping to			Measurement: Length and Perimeter White Rose Small Steps: 9 1. Measure in kilometres and metres 2. Equivalent lengths (kilometres and metres) 3. Perimeter on a grid 4. Perimeter of a rectangle 5. Perimeter of rectilinear shapes 6. Finding missing lengths in rectilinear shapes 7. Calculate the perimeter of rectilinear shapes 8. Perimeter of regular polygons 9. Perimeter of polygons <u>Substantive Knowledge</u> • NPV4 Divide 1,000 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 1,000 with 2, 4, 5 and 10 equal parts. • G2 Find the perimeter of regular and irregular polygons. • NC: Convert between different units of measure • NC: Measure and calculate the perimeter of a		Number: Fractions White Rose Small Steps: 15 1. Understand the whole 2. Count beyond 1 3. Partition a mixed number 4. Number lines with mixed numbers 5. Compare and order mixed numbers 6. Understand improper fractions 7. Convert mixed numbers to improper fractions 8. Convert improper fractions to mixed numbers 9. Equivalent fractions on a number line 10. Equivalent fraction families 11. Add two or more fractions 12. Add fractions and mixed numbers 13. Subtract two fractions 14. Subtract from whole amounts 15. Subtract from mixed numbers <u>Substantive Knowledge</u> • F1 Reason about the location of mixed numbers in the linear number system. • F2 Convert mixed numbers to improper fractions and vice versa. • F3 Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers. • NC: Recognise and show, using diagrams, families of common equivalent fractions • NC: Count up and down in hundredths • NC: Recognise that hundredths arise when dividing an object by a 100 and dividing tenths by 10.			Number: Decimals A White Rose Small Steps: 10 1. Tenths as fractions 2. Tenths as decimals 3. Tenths on a place value chart 4. Tenths on a number line 5. Divide a 1-digit number by 10 6. Divide a 2-digit number by 10 7. Hundredths as fractions 8. Hundredths as decimals 9. Hundredths on a place value chart 10. Divide a 1- or 2-digit number by 100 <u>Substantive Knowledge</u> • NC: Recognise and write decimal equivalents of any number of tenths or hundredths. • NC: Find the effect of dividing a one- or two-digit number by 10 or 100, identifying the value of the digits in the answer as ones, tenths and hundredths • NC: Solve simple measure and money problems involving fractions and decimals to two decimal places. • NC: Convert between different units of measure [for example, kilometre to metre			

whole number quotients); understand this as equivalent to making a number 10 or 100 times the size. • MD2 Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication. • NC: 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 • NC: Recognise and use factor pairs and commutativity in mental calculations • NC: Multiply two-digit and three-digit numbers by a one-digit number using formal written layout • NC: 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. <u>NCETM PD Materials</u> Spine 2: Multiplication and Division 2.6 Structures and quotitive and partitive division (TP 5) 2.8 Times tables: 3, 6 and 9, and the relationship between them 2.9 Times tables: 7 and patterns within/across times tables 2.13 Calculation: multiplying and dividing by 10 or 100 2.10 Connective multiplication and division, and the distributive law 2.14 Multiplication: partitioning leading to short multiplication 2.15 Division: partitioning leading to short division	rectilinear figure (including squares) in centimetres and metres <u>NCETM PD Materials</u> Spine 2: Multiplication and Division 2.16 Multiplication contexts: area and perimeter (1)	• NC: 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 • NC: Add and subtract fractions with the same denominator <u>NCETM PD Materials</u> Spine 3: Fractions 3.0 Guidance on the teaching of fractions in Key Stage 1 3.4 Adding and subtracting within one whole (TP 1-2) 3.5 Working across one whole: improper fractions and mixed numbers 3.7 Finding equivalent fractions and simplifying fractions	<u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.23 Compositing and calculation: tenths 1.24 Composition and calculation: hundredths and thousandths <i>*Mainly TP 1 and some of TP 2.</i> Spine 2: Multiplication and Division 2.13 Calculation: multiplying and dividing by 10 or 100
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Year 5: Small Steps to Mastery and Substantive Knowledge

Year 5 SPRING Term

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Number: Multiplication and Division B White Rose Small Steps: 11 1. Multiply up to a 4-digit number by a 1-digit number 2. Multiply a 2-digit number by a 2-digit numbers (area model) 3. Multiply a 2-digit number by a 2-digit number 4. Multiply a 3-digit number by a 2-digit number 5. Multiply a 4-digit number by a 2-digit number 6. Solve problems with multiplication 7. Short division 8. Divide a 4-digit number by a 1-digit number 9. Divide with remainders 10. Efficient division 11. Solve problems with multiplication and division Substantive Knowledge • MD1 Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size. • MD2 Find factors and multiples of positive integers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors. • NC: Multiply and divide numbers mentally drawing upon known facts • NC: Multiply numbers up to 4 digits by a			Number: Fractions B White Rose Small Steps: 7 1. Multiply a unit fraction by an integer 2. Multiply a non-unit fraction by an integer 3. Multiply a mixed number by an integer 4. Calculate a fraction of a quantity 5. Fraction of an amount 6. Find the whole 7. Use fractions as operators Substantive Knowledge • 5F2 Find equivalent fractions and understand that they have the same value and the same position in the linear number system. • 5F1 Find non-unit fractions of quantities • NC: Compare and order fractions whose denominators are all multiples of the same number • NC: Identify, name and write equivalent fractions of a given fraction, represented visually,		Number: Decimals and Percentages White Rose Small Steps: 15 1. Decimals up to 2 decimal places 2. Equivalent fractions and decimals (tenths) 3. Equivalent fractions and decimals (hundredths) 4. Equivalent fractions and decimals 5. Thousandths as fractions 6. Thousandths as decimals 7. Thousandths on a place value chart 8. Order and compare decimals (same number of decimal places) 9. Order and compare any decimals with up to 3 decimal places 10. Round to the nearest whole number 11. Round to 1 decimal place 12. Understand percentages 13. Percentages as fractions 14. Percentages as decimals 15. Equivalent fractions, decimals and percentages Substantive Knowledge • NPV-1 Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1. Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01. Know that 10 hundredths are			Measurement: Perimeter and Area White Rose Small Steps: 6 1. Perimeter of rectangles 2. Perimeter of rectilinear shapes 3. Perimeter of polygons 4. Area of rectangles 5. Area of compound shapes 6. Estimate area Substantive Knowledge • G2 Compare areas and calculate the area of rectangles (including squares) using standard units. • NC: Calculate and compare the are of rectangles (including squares) using standard units cm ² /m ² • NC: Measure and calculate the perimeter of composite rectilinear shapes in cm and m NCETM PD Materials 2.16 Multiplicative contexts: are and perimeter (1) *Revisit		Statistics White Rose Small Steps: 5 1. Draw line graphs 2. Read and interpret line graphs 3. Read and interpret tables 4. Two-way tables 5. Read and interpret timetables Substantive Knowledge • NPV4 Divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 2, 4, 5 and 10 equal parts. • NC: Solve comparison, sum and difference problems using information presented in a line graph • NC: Complete, read and interpret information in tables, including timetables	

one/two-digit number using a formal written method, including long multiplication for 2-digit numbers • NC: Divide numbers up to 4 digits by a 1-digit number using the formal written method of short division and interpret remainders appropriately for the context. • NC: solve problems involving addition and subtraction, multiplication and division and a combination of these, including understanding the use of the = sign <u>NCETM PD Materials</u> Spine 2: Multiplication and Division 2.9 Times tables: 7 and patterns within/across times tables (square numbers) 2.13 Calculation: Multiplying and dividing by 10 or 100 2.18 Using equivalence to calculate 2.19 Calculation: $x \div$ fractions by whole numbers 2.20 Multiplication with three factors and volume (cube numbers) 2.21 Factors, multiples, prime numbers and composite numbers	including tenths and hundredths • NC: Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number <u>NCETM PD Materials</u> Spine 3: Fractions 3.1 Preparing for fractions: the part-whole relationship 3.2 Unit fractions: identifying, representing and comparing 3.3 Non unit fractions: identifying, representing and comparing 3.4 Adding and subtracting within one whole 3.5 Working across one whole: improper fractions and mixed numbers 3.6 Multiplying whole numbers and fractions 3.7 Finding equivalent fractions and simplifying fractions 3.8 Common denominator: more adding and subtracting	equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01. • NPV-2 Recognise the place value of each digit in numbers with up to 2 decimal places, and compose and decompose numbers with up to 2 decimal places using standard and non-standard partitioning. • NPV-3 Reason about the location of any number with up to 2 decimal places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each. • NPV4 Divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 2, 4, 5 and 10 equal parts. • F-3 Recall decimal fraction equivalents for half, quarter, fifth, tenth and for multiples of these proper fractions • NC: Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • NC: Read, write, order and compare numbers with up to 3 decimal places • NC: Round decimals with two decimal places to the nearest whole number and to one decimal place • NC: Solve problems involving numbers up to 3 decimal places • NC: Recognise the per cent symbol (%) and understand that per cent relates to "number of parts per 100"		<u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.28 Common structures and the part-part-whole relationship 1.29 Using equivalence and the compensation property to calculate
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| | | <ul style="list-style-type: none">• NC: Write percentages as a fraction with denominator 100, and as a decimal fraction• NC: Solve problems which require knowing decimal equivalents and those fractions with a denominator of a multiple of 10 or 25 | | |
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NCETM PD Materials

Spine 1: Addition and Subtraction

[1.23](#) Compositing and calculation: tenths

[1.24](#) Composition and calculation: hundredths and thousandths

Spine 3: Fractions

[3.10](#) Linking fractions, decimals and percentages

Year 6: Small Steps to Mastery and Substantive Knowledge

Year 6 SPRING Term

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Number: Ratio White Rose Small Steps: 10 1. Add or multiply 2. Use ratio language 3. Introduction to the ratio symbol 4. Ratio and fractions 5. Scale drawing 6. Use scale factors 7. Similar shapes 8. Ratio problems 9. Proportion problems 10. Recipes <u>Substantive Knowledge</u> • AS/MD3 Solve problems involving ratio relationships. • NC: Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts • NC: Solve problems involving similar shapes where the scale factor is known or can be found • NC: Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples		Number: Algebra White Rose Small Steps: 10 1. 1-step function machines 2. 2-step function machines 3. Form expressions 4. Substitution 5. Formulae 6. Form equations 7. Solve simple one-step equations 8. Solve two-step equations 9. Find pairs of values 10. Solve problems with two unknowns <u>Substantive Knowledge</u> • 6AS/MD-4 Solve problems with 2 unknowns. • NC: Use simple formulae • NC: Generate and describe linear number sequences • NC: Express missing number problems algebraically • NC: Find pairs of numbers that satisfy an equation with two unknowns • NC: Enumerate possibilities of combinations of 2 variables.		Number: Decimals White Rose Small Steps: 9 1. Place value within 1 2. Place value – integers and decimals 3. Round decimals 4. Add and subtract decimals 5. Multiply by 10, 100 and 1,000 6. Divide by 10, 100 and 1,000 7. Multiply decimals by integers 8. Divide decimals by integers 9. Multiply and divide decimals in context <u>Substantive Knowledge</u> • NPV2 Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning. • NPV1 Understand the relationship between		Number: Fractions, Decimals and Percentages White Rose Small Steps: 9 1. Decimal and fraction equivalents 2. Fractions as division 3. Understand percentages 4. Fractions to percentages 5. Equivalent fractions, decimals and percentages 6. Order fractions, decimals and percentages 7. Percentage of an amount – one step 8. Percentage of an amount – multi-step 9. Percentages – missing values <u>Substantive Knowledge</u> • NC: Solve problems involving the calculation of percentages • NC: Recall and use equivalences between		Measurement: Area, Perimeter and Volume White Rose Small Steps: 8 1. Shapes – same area 2. Area and perimeter 3. Area of a triangle – counting squares 4. Area of a right-angled triangle 5. Area of any triangle 6. Area of parallelogram 7. Volume – counting cubes 8. Volume of a cuboid <u>Substantive Knowledge</u> • G1 Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems. • NC: Recognise that shapes with the same areas can have different perimeters and vice versa • NC: Recognise when it is possible to use formulae for area and volume of shapes • NC: Calculate the area of parallelograms and triangles		Statistics White Rose Small Steps: 6 1. Line graphs 2. Dual bar charts 3. Read and interpret pie charts 4. Pie charts with percentages 5. Draw pie charts 6. The mean <u>Substantive Knowledge</u> • NC: Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius • NC: Interpret and construct pie charts and line graphs and use these to solve problems • NC: Calculate and interpret the mean as an average <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.28 Common structures and the part-part-whole relationship	

<u>NCETM PD Materials</u> Spine 2: Multiplication and Division 2.27 Scale factors, ratio and proportional reasoning	<u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.28 Common structures and the part-part-whole relationship 1.31 Problems with two unknowns	powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000 (NC) giving answers are up to three decimal places • NC: Multiply one-digit numbers with up to 2 decimal places by whole numbers • NC: Use written division methods in cases where the answer has up to 2 decimal places • NC: Solve problems which require answers to be rounded to specified degrees of accuracy • NC: Identify the value of each digit in numbers given to three decimal places and multiply numbers by 10, 100 and 1000 giving answers up to 3 decimal places <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.24 Composition and calculation: hundredths	simple fractions, decimals and percentages, including in different contexts • NC: recall and use equivalences between simple fractions, decimals and percentages, including in different contexts <u>NCETM PD Materials</u> Spine 3: Fractions 3.10 Linking fractions, decimals and percentages	• NC: Calculate, estimate and compare volume of cubes and cuboids using standard units (cm³ and m³) and extending to other units (mm³ and km³) <u>NCETM PD Materials</u> Spine 2: Multiplication and Division 2.16 Multiplication contexts: area and perimeter (1) 2.20 Multiplication with three factors and volume 2.30 Multiplicative contexts: area and perimeter (2)	Spine 2: Multiplication and Division 2.26 Mean average and equal shares Spine 3: Fractions 3.10 Linking fractions, decimals and percentages
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and thousandths (for 3 d.p.)

Spine 2: Multiplication and Division

[2.19](#) Calculation: $\times/\div$ decimal fractions by whole numbers

[2.28](#) Combining division with addition and subtraction

[2.29](#) Decimal place value knowledge, multiplication and division

Spine 3: Fractions

[3.10](#) Linking fractions, decimals and percentages

Summer Long Term Planning Y1-Y6



Stretton St Matthew's
C.E. Primary School

Year 1: Small Steps to Mastery and Substantive Knowledge

Year 1 Summer Term

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11							
Number: Multiplication and Division White Rose Small Steps: 9 1. Count in 2s 2. Count in 10s 3. Count in 5s 4. Recognise equal groups 5. Add equal groups 6. Make arrays 7. Make doubles 8. Make equal groups – grouping 9. Make equal groups – sharing <u>Substantive Knowledge</u> • RTP: NF2 Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning • NC: Count in multiples of 2’s, 5’s and 10’s • NC: Solve one step problems involving multiplication and division by calculating the answer using concrete objects, pictorial representations and arrays <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.8 Composition of numbers: multiples of 10 up to 100 (TP 2) Spine 2: Multiplication and Division 2.1 Counting, unitising and coins (TP1-3)			Number: Fractions White Rose Small Steps: 8 1. Recognise a half of an object or a shape 2. Find a half of an object or a shape 3. Recognise half of a quantity 4. Find half of a quantity 5. Recognise a quarter of an object or a shape 6. Find a half of an object or a shape 7. Recognise a quarter of a quantity 8. Find a quarter of a quantity <u>Substantive Knowledge</u> • NC: Recognise, find and name a half as one of two equal parts of an object, shape or quantity • NC: Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity • NC: Compare, describe and solve practical problems for lengths and heights, e.g. long/short, longer/shorter, tall/short, double/half			Geometry: Position and Direction White Rose Small Steps: 5 1. Describe turns 2. Describe position – left and right 3. Describe position – forwards and backwards 4. Describe position – above and below 5. Ordinal numbers <u>Substantive Knowledge</u> • RTP: G2 Compose 2D and 3D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations • NC: Describe position, directions and movement, including whole, half, quarter and three-quarter turns			Measurement: Place Value (within 100) White Rose Small Steps: 7 1. Count from 50 to 100 2. Tens to 100 3. Partition into tens and ones 4. The number line to 100 5. One more, one less 6. Compare numbers with the same number of tens 7. Compare any two numbers <u>Substantive Knowledge</u> • RTP: NPV1 Count within 100, forwards and backwards, starting with any number. • NC: Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number • NC: Count, read and write numbers to 100 in numerals; count in multiples of 2s, 5s and 10s • NC: Given a number, identify 1 more and 1 less • NC: 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			Measurement: Money White Rose Small Steps: 4 1. Unitising 2. Recognise coins 3. Recognise notes 4. Count in coins <u>Substantive Knowledge</u> • NC: Recognise and know the value of different denominations of coins and notes <u>NCETM PD Materials</u> Spine 2: Multiplication and Division 2.1 Counting, unitising and coins (TP 4-6)			Measurement: Time White Rose Small Steps: 6 1. Before and after 2. Days of the week 3. Months of the year 4. Hours, minutes and seconds 5. Tell the time to the hour 6. Tell the time to the half hour <u>Substantive Knowledge</u> • NC: Compare, describe and solve practical problems for time e.g. quicker, slower, earlier, later • NC: Measure and begin to record time (hours, minutes, seconds) • NC: Sequence events in chronological order using language e.g. before, after, next, first, today, yesterday, tomorrow, morning, afternoon and evening • NC: recognise and use language relating to dates, including days of the week, weeks, months and years		

	• NC: Compare, describe and solve practical problems for mass and weights, e.g. heavy/light, heavier than/lighter than, Capacity and volume e.g. full/empty, more than, less than, half, half full, quarter <u>NCETM PD Materials</u> Spine 3: Fractions 3.0 Guidance on the teaching of fractions in Key Stage 1				• NC: Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times
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Year 2: Small Steps to Mastery and Substantive Knowledge

Year 2 SUMMER Term

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Number: Fractions White Rose Small Steps: 15 1. Introduction to parts and whole 2. Equal and unequal parts 3. Recognise a half 4. Find a half 5. Recognise a quarter 6. Find a quarter 7. Recognise a third 8. Find a third 9. Find the whole 10. Unit fractions 11. Non-unit fractions 12. Recognise the equivalence of a half and two quarters 13. Recognise three-quarters 14. Find three-quarters 15. Count in fractions up to a whole Substantive Knowledge • NC: 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 • NC: Write simple fractions, for example $\frac{1}{2}$ of $6 = 3$ • NC: Recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$. NCETM PD Materials N/A			Measurement: Time White Rose Small Steps: 7 1. O'clock and half past 2. Quarter past and quarter to 3. Tell time past the hour 4. Tell the time to 5 minutes 6. Minutes in an hour 7. Hours in a day Substantive Knowledge • NC: Compare and sequence intervals of time • NC: 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. • NC: Know the number of minutes in an hour and the number of hours in a day • NC: Draw hands on a clock to show these times NCETM PD Materials N/A			Statistics White Rose Small Steps: 7 1. Make tally charts 2. Tables 3. Block diagrams 4. Draw pictograms (1-1) 5. Interpret pictograms (1-1) 6. Draw pictograms (2, 5 and 10) 7. Interpret pictograms (2, 5 and 10) Substantive Knowledge • RTP: MD1 Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size. • RTP: NPV2 Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non- standard partitioning. • NC: Interpret and construct simple pictograms, tally charts, block diagrams and tables • NC: Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity • NC: Ask and answer questions about totalling and comparing categorical data NCETM PD Materials Spine 1: Addition and Subtraction 1.12 Subtraction as difference		Geometry: Position and Direction White Rose Small Steps: 5 1. Language of position 2. Describe movement 3. Describe turns 4. Describe movement and turns 5. Shape patterns with turns Substantive Knowledge • NC: Order and arrange combinations of mathematical objects in patterns and sequences • NC: Use mathematical vocabulary to describe position, direction and movement including movement in a straight line • NC: Distinguish between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise). NCETM PD Materials N/A		CONSOLIDATION	

Year 3: Small Steps to Mastery and Substantive Knowledge

Year 3 SUMMER Term

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Number: Fractions B White Rose Small Steps: 6 1. Add fractions 2. Subtract fractions 3. Partition the whole 4. Unit fractions of a set of objects 5. Non-unit fractions of a set of objects 6. Reasoning with fractions of an amount <u>Substantive Knowledge</u> • F1 Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts (unit fractions and non-unit fractions with small denominators) • F2 Find unit fractions of quantities using known division facts (multiplication tables fluency). • F3 Reason about the location of any fraction within 1 in the linear number system. • F4 Add and subtract fractions with the same denominator, within 1. • NC: Compare and order unit fractions and fractions with the same denominators		Measurement: Money White Rose Small Steps: 5 1. Pounds and pence 2. Convert pounds and pence 3. Add money 4. Subtract money 5. Find change <u>Substantive Knowledge</u> • NPV2 and AS2 • NPV4 Divide 100 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal parts. • NC: Add and subtract amounts of money to give change, using both £ and p in practical contexts <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.25 Addition and subtraction: money Spine 2: Multiplication and Division 2.1 Counting, unitising and coins		Measurement: Time White Rose Small Steps: 12 1. Roman numerals to 12 2. Tell the time to 5 minutes 3. Tell the time to the minute 4. Read time on a digital clock 5. Use a.m. and p.m. 6. Years, months and days 7. Days and hours 8. Hours and minutes – use start and end times 9. Hour and minutes – use durations 10. Minutes and seconds 11. Units of time 12. Solve problems with time <u>Substantive Knowledge</u> • NC: Tell and write the time from an analogue clock, including using Roman numerals from I to XII • NC: Tell the 12-hour and 24-hour clocks • NC: 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 • NC: Know the number of seconds in a minute • NC: Know the number of days in each month, year and leap year • NC: Compare durations of events			Geometry: Shape White Rose Small Steps: 10 1. Turns and angles 2. Right angles 3. Compare angles 4. Measure and draw accurately 5. Horizontal and vertical 6. Parallel and perpendicular 7. Recognise and describe 2D shapes 8. Draw polygons 9. Recognise and describe 3D shapes 10. Make 3D shapes <u>Substantive Knowledge</u> • G1 Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations. NC: recognise that 2 right angles make a half-turn, 3 make three quarters of a turn and 4 a complete turn; identify whether angles are greater than or less than a right angle. • G2 Draw polygons by joining marked points,		Statistics White Rose Small Steps: 6 1. Interpret pictograms 2. Draw pictograms 3. Interpret bar charts 4. Draw bar charts 5. Collect and represent data 6. Two-way tables <u>Substantive Knowledge</u> • NC: Interpret and present data – bar charts, pictograms and tables • NC: Using information presented in scaled bar charts, pictograms and tables, solve one-step and two-step questions e.g. How many more? How many fewer? <u>NCETM PD Materials</u> N/A		CONSOLIDATION

• NC: Recognise and show, using diagrams, equivalent fractions with small denominators • NC: Compare and order unit fractions, and fractions with the same denominators • NC: Solve problems that involve all of the above <u>NCETM PD Materials</u> Spine 3: Fractions 3.3 Non unit fractions: identifying, representing and comparing 3.4 Adding and subtracting within one whole 3.7 Finding equivalent fractions and simplifying fractions (TP 1-2)		<u>NCETM PD Materials</u> N/A	and identify parallel and perpendicular sides. NC: identify horizontal and vertical lines • NC: Recognise angles as a property of shape or a description of a turn • NC: Identify right angles • NC: Recognise that 2 right angles make a half turn, 3 make three quarters of a turn and 4 make a complete turn. • NC: Identify whether angles are greater than or less than a right angle • NC: Identify horizontal and vertical lines • NC: Identify pairs of perpendicular and parallel lines • NC: Draw 2D shapes and make 3D shapes using modelling materials • NC: Recognise 3D shapes in different orientations and describe them <u>NCETM PD Materials</u> N/A	
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Year 4: Small Steps to Mastery and Substantive Knowledge

Year 4 SUMMER Term

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	
Number: Decimals B White Rose Small Steps: 8 1. Make a whole with tenths 2. Make a whole with hundredths 3. Partition decimals 4. Flexibly partition decimals 5. Compare decimals 6. Order decimals 7. Round to the nearest whole number 8. Halve and quarters as decimals <u>Substantive Knowledge</u> • MD-1 Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size. • NC: Understand the effect of dividing a one or two digit number by 10 or 100 • NC: Recognise and write decimal equivalents to 1/4, 1/2 and 3/4 • NC: Identifying the value of the digits in the answer as ones, tenths and hundredths. • NC: Round decimals with one decimal place to the		Measurement: Money White Rose Small Steps: 6 1. Write money using decimals 2. Convert between pounds and pence 3. Compare amounts of money 4. Estimate with money 5. Calculate with money 6. Solve problems with money <u>Substantive Knowledge</u> • NC: Estimate, compare and calculate different measures, including money in pounds and pence • NC: Solve simple measure and money problems involving fractions and decimals to two decimal places <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.22 Composition and calculation: 1000 and four-digit numbers		Measurement: Time White Rose Small Steps: 5 1. Years, months, weeks and days 2. Hours, minutes and seconds 3. Convert between analogue and digital times 4. Convert to the 24 hours clock 5. Convert from the 24 hours clock <u>Substantive Knowledge</u> • NC: Read, write and convert time between analogue and digital 12- and 24-hour clocks • NC: Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days <u>NCETM PD Materials</u> N/A		CONSOLIDATION	Geometry: Shape White Rose Small Steps: 8 1. Understand angles as turns 2. Identify angles 3. Compare and order angles 4. Triangles 5. Quadrilaterals 6. Polygons 7. Lines of symmetry 8. Complete a symmetric figure <u>Substantive Knowledge</u> • G-2 Identify regular polygons, including equilateral triangles and squares, as those in which the side-lengths are equal and the angles are equal. Find the perimeter of regular and irregular polygons. • G-3 Identify line symmetry in 2D shapes presented in different orientations. Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry. • G-1 Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant		Statistics White Rose Small Steps: 4 1. Interpret charts 2. Comparison, sum and difference 3. Interpret line graphs 4. Draw line graphs <u>Substantive Knowledge</u> • 4NPV-4 Divide 1,000 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 1,000 with 2, 4, 5 and 10 equal parts. • NC: Interpret and present discrete and continuous data using appropriate graphical		Geometry: Position and direction White Rose Small Steps: 4 1. Describe position using coordinates 2. Plot coordinates 3. Draw 2D shapes on a grid 4. Translate on a grid 5. Describe translation on a grid <u>Substantive Knowledge</u> • G-1 Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant. • NC: Describe positions on a 2-D grid as coordinates in the first quadrant • NC: Describe movements between positions as translations of a given unit to the left/right and up/down • NC: Plot specified points and draw sides to complete a given polygon	

nearest whole number • NC: Compare numbers with the same number of decimal places up to two decimal places <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.24 Composition and calculation: hundredths and thousandths (TP 2 and 7)	1.25 Addition and subtraction: money			• NC: Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes • NC: Identify acute and obtuse angles • NC: Compare and order angles up to two right angles by size • NC: Identify lines of symmetry in 2-D shapes presented in different orientations <u>NCETM PD Materials</u> N/A	methods, including bar charts and time graphs. • NC: Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.	<u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.27 Negative numbers: counting, comparing and calculating (TP 6)
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Year 5: Small Steps to Mastery and Substantive Knowledge

Year 5 SUMMER Term

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12		
Geometry: Properties of Shape White Rose Small Steps: 10 1. Understand and use degrees 2. Classify angles 3. Estimate angles 4. Measure angles up to 180 5. Draw lines and angles accurately 6. Calculate angles around a point 7. Calculate angles on a straight line 8. Lengths and angles in shapes 9. Regular and irregular polygons 10. 3D shapes <u>Substantive Knowledge</u> • G-1 Compare angles, estimate and measure angles in degrees (°) and draw angles of a given size • NC: Identify 3-D shapes, including cubes and other cuboids, from 2- D representations • NC: Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • NC: Draw given angles, and measure them in degrees (°) • NC: Identify angles at a point and one whole turn (total 360°) • NC: Identify angles at a point on a straight line and ½ a turn (total 180°) • NC: Identify other multiples of 90° • NC: Use the properties of rectangles to deduce related facts and find missing lengths and angles			Geometry: Position and direction White Rose Small Steps: 6 1. Read and plot coordinates 2. Problem solving with coordinates 3. Translation 4. Translation with coordinates 5. Lines of symmetry 6. Reflection in horizontal and vertical lines <u>Substantive Knowledge</u> • NC: 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. <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.27 Negative numbers: counting, comparing and calculating (TP 6)		Number: Decimals White Rose Small Steps: 12 1. Use known facts to add and subtract decimals within 1 2. Complements to 1 3. Add and subtract decimals across 1 4. Add decimals with the same number of decimal places 5. Subtract decimals with the same number of decimal places 6. Add decimals with different numbers of decimal places 7. Subtract decimals with different number of decimal places 8. Efficient strategies for adding and subtracting decimals 9. Decimal sequences 10. Multiply by 10, 100 and 1000 11. Divide by 10, 100 and 1000 12. Multiply and divide decimals - missing values <u>Substantive Knowledge</u> • NPV-1 Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1. Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01. Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01 • 5MD-1 Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or			Number: Negative Numbers White Rose Small Steps: 5 1. Understand negative numbers 2. Count through zero in 1s 3. Count through zero in multiples 4. Compare and order negative numbers 5. Find the difference <u>Substantive Knowledge</u> • NC: Interpret number greater than and less than zero in different contexts • NC: Identify and place negative numbers on a number line • NC: Interpret sets of negative and positive number in a range of contexts • NC: Use their knowledge of positive and		Measurement: Converting Units White Rose Small Steps: 6 1. Kilograms and kilometres 2. Millimetres and millilitres 3. Convert units of length 4. Convert between metric and imperial units 5. Convert units of time 6. Calculate with timetables <u>Substantive Knowledge</u> • NPV-5 Convert between units of measure, including using common decimals and fractions. • NC: Convert between different units of metric measure (e.g. km and m, cm and m, cm and mm, g and kg, ml and l) • NC: Understand and use approximate		Measurement: Volume White Rose Small Steps: 8 1. Cubic centimetres 2. Compare volume 3. Estimate volume 4. Estimate capacity <u>Substantive Knowledge</u> • NC: Estimate volume (e.g. using 1cm ³ blocks to build cuboids, including cubes) and capacity (e.g. using water) • NC: Use all 4 operations to solve problems involving measure	

• NC: Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.		100 times the size, or 1 tenth or 1 hundredth times the size. • NPV-3 Reason about the location of any number with up to 2 decimals places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each. • NPV-4 Divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 2, 4, 5 and 10 equal parts • NC: Recognise and write decimal equivalents of any number of tenths, hundredths • NC: Find the effect of dividing a 1 or 2 digit number by 10 or 100, identifying the value of the digits in the answer as ones, tenths and hundredths • NC: Solve simple measure and money problems involving fractions and decimals to 2 decimal places • NC: Convert between different units of measure e.g. kilometre to metre <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.23 Compositing and calculation: tenths 1.24 Composition and calculation: hundredths and thousandths Spine 2: Multiplication and Division 2.19 Calculation: $\times/\div$ fractions by whole numbers 2.29 Decimal place value knowledge, multiplication and division	negative numbers to calculate intervals	equivalences between metric units and common imperial units such as inches, pounds and pints • NC: Solve problems involving converting between units of time <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.24 Composition and calculation: hundredths and thousandths (TP 5)	<u>NCETM PD Materials</u> Spine 2: Multiplication and Division 2.20 Multiplication with three factors and volume
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Year 6: Small Steps to Mastery and Substantive Knowledge

Year 6 SUMMER Term

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Geometry: Properties of Shape White Rose Small Steps: 11 1. Measure and classify angles 2. Calculate angles 3. Vertically opposite angles 4. Angles in a triangle 5. Angles in a triangle – special cases 6. Angles in a triangle – missing angles 7. Angles in quadrilaterals 8. Angles in polygons 9. Circles 10. Draw shapes accurately 11. Nets of 3D shapes <u>Substantive Knowledge</u> • 6G-1 Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems. • NC: Draw 2-D shapes using given dimensions and angles • NC: Recognise, describe and build simple 3-D shapes, including making nets • NC: Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons • NC: Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius • NC: Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. <u>NCETM PD Materials</u> Spine 1: Addition and Subtraction 1.28 Common structures and the part-part-whole relationship (TP 4 – missing angles only)			Geometry: Position and Direction White Rose Small Steps: 5 1. The first quadrant 2. Read and plot points in four quadrants 3. Solve problems with coordinates 4. Translations 5. Reflections <u>Substantive Knowledge</u> • NC: Describe positions on the full coordinate grid (all four quadrants) • NC: Draw and translate simple shapes on the coordinate plane, and reflect them in the axes		Number, Geometry and Substantial Problem Solving Following on from National Assessments in May, teachers will assess children’s understanding against all Ready to Progress statements and plan to cover any areas that need further consolidation. Additional projects will be explored to allow the children to explore the purpose of mathematics through open-ended investigations. Children will tackle open-ended problem solving and further develop their understanding at Greater Depth as appropriate.						

Mathematics Unit Planning (Examples)



Stretton St Matthew's
C.E. Primary School

Coherence – Putting together a detailed, coherent conceptual journey for learners.

Representation and Structure – Exploring different representations of a concept to support generalisation.

Variation – Procedural and conceptual variation to draw learners attention to invariants .

Fluency – Flexible thinking an access to number facts and their derivations to support problem solving.

Mathematical Thinking – Relying on reasoning, rather than counting, to solve problems.

Mathematical Concept: Count to twenty, forwards and backwards beginning at any number Read and write numbers to 20 in numerals and words Find one more and one less than numbers up to 20 Represent numbers up to 20 using objects and pictorial representations Compare and order numbers to 20	Pre-Assessment Notes: Pre Assessment task Lesson 1 Make connections with Number and Place Value to 10. Discuss knowledge organiser prompts.	Pre-Learning: Number and Place Value to 10 Sort objects • Count objects • Read and write numbers up to 10 in numerals and in words • Find one more and one less • Represent numbers using objects and pictures • Compare objects
White Rose Small Steps: White Rose Small Steps: 8 • Count forwards and backwards and write numbers to 20 in numerals and words • Numbers from 11 to 20 • Tens and ones • Count 1 more/ 1 less • Compare groups of objects • Compare numbers • Order groups of objects • Order numbers	Ready-To-Progress Criteria: 1NPV-1 Count within 100, forwards and backwards, starting with any number. 1NPV-2 Reason about the location of numbers to 20 within the linear number system, including comparing using < > and = NCETM PD Materials: 1:10 Composition of numbers 11-19 (TP 1 and 2) 1NPV-2 Reason about the location of numbers to 20 within the linear number system, including comparing using < > and =	Key Vocabulary: Number line Part whole model Tens frame More than Less than Fewer than Greater than Equal to Most/least Total Count Numeral
National Curriculum Links: - count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number - count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens - identify 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.		

Lesson	Do Now (Starter)	New Learning (Teach)	Let's Explore (Plain page in books – up to 3 questions)	Develop Learning (Teach)	Independent Task (Application carefully thought out questions to challenge the children)	Plenary
Count forwards and backwards and write numbers in words and numbers to 20	https://www.topmarks.co.uk/learning-to-count/paint-the-squares Number square splat.	Ask children what comes after the number 10. Get the children to say numbers up to 20. Display numbers and ask pupils to look for a pattern. Point out the end digit when counting forward and the first digit when counting back. Look at 10 frame as representations of numbers above 10.	Pupils to count counters in 10 frame and match number to representation. Allow pupils to create their own.	Look at how to write numbers 1-20. In numbers and words Allow pupils to spot mistakes in writing two digit numbers e.g. 31 instead of 13. Look at how to write numbers in words. Look at the 'teen' ending to help learning.	Allow pupils to complete questions to test their understanding.	https://www.topmarks.co.uk/learning-to-count/helicopter-rescue count forwards and backwards
Numbers from 11-20	Which number comes next?	Look at different ways to represent numbers. Look at ways to write the number as a numeral and as a word.	Match up activity.	Use ten frame, counters, fingers, objects. Check if children identify numbers quickly by noting that a ten frame is 10 so they can count on from 10 etc. Look at odd one out	Children to use representations to show numbers in words and numerals to complete the chart and varied fluency task.	True or false, has Mo made 16 in three different ways?
Tens and Ones	What number is this?	Look at the fact that 10 ones is the same as one ten. Show representations to demonstrate. Develop by explaining that numbers above ten are, one ten plus some more e.g. eleven is ten plus one. Ensure children understand that one ten is bigger than one ~~one~~ .	Children to complete activities to show there understanding of using a ten frame to show one ten plus ones.	Look at base ten blocks as a different representation and part whole models. Develop children's mathematical language, e.g. one ten plus three ones equals thirteen. Use simple number facts. Ensure children understand how to recognise ten frame and base ten for ease of counting.	Children to match the number sentences to the representations.	Are all the numbers to twenty made up of ten plus some more?
Tens and ones	Flashback 4 ~~wk~~ 11	Revisit the number sentences, e.g. one ten plus three ones equals thirteen. Use simple number facts. Check pupil ability to	Practice more number facts.	Practise using part whole models to show how a number is represented. E.g. 'My number is ... One part is...	Children to complete the number sentences e.g. one ten and six ones equals sixteen.	The ten frame shows the number 16? Purple pen review.



- Coherence** – Putting together a detailed, coherent conceptual journey for learners.
- Representation and Structure** – Exploring different representations of a concept to support generalisation.
- Variation** – Procedural and conceptual variation to draw learners attention to invariants .
- Fluency** – Flexible thinking an access to number facts and their derivations to support problem solving.
- Mathematical Thinking** – Relying on reasoning, rather than counting, to solve problems.

Mathematical Concept: Number and Place Value

Key Vocabulary:

Numbers 1-100, count, representation, objects, items, part-whole diagram, larger, smaller, biggest, smallest, numerals, groups, tens, ones, partition, addition, calculate, number frame, order.

Pre-Assessment Notes:

Children should revisit the idea of mass and capacity initially focusing on non-standard units such as cubes and jugs respectively.

Pre-Assessment Task 5.9.22

Pre-Learning:

Share knowledge organiser with pupils and link to working wall. Chn to have copies of KO in books to reference throughout the unit of work. Focus on vocabulary to explore meanings of new words.

White Rose Small Steps: 16

1. Numbers to 20
2. Count objects to 100 by making 10s
3. Recognise tens and ones
4. Use a place value chart
5. Partition numbers to 100
6. Write numbers to 100 in words
7. Flexibly partition numbers to 100
8. Write numbers to 100 in expanded form
9. 10s on the number line to 100
10. 10s and 1s on the number line to 100
11. Estimate numbers on a number line
12. Compare objects
13. Compare numbers
14. Order objects and numbers
15. Count in 2s, 5s and 10s
16. Count in 3s

Substantive Knowledge

- RTP: NPV1 Recognise place value of each digit in 2 digit numbers; compose and decompose 2 digit numbers (standard + non- standard partitioning)
- RTP: NPV2 Reason about the location of any 2 digit number, including identifying the previous and next multiple of 10.
- NC: read and write numbers to at least 100 in numerals and in words
- NC: identify, represent and estimate numbers using different representations, including the number line
- NC: compare and order numbers from 0 up to 100; use and = signs
- NC: count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward
- NC: use place value and number facts to solve problems.

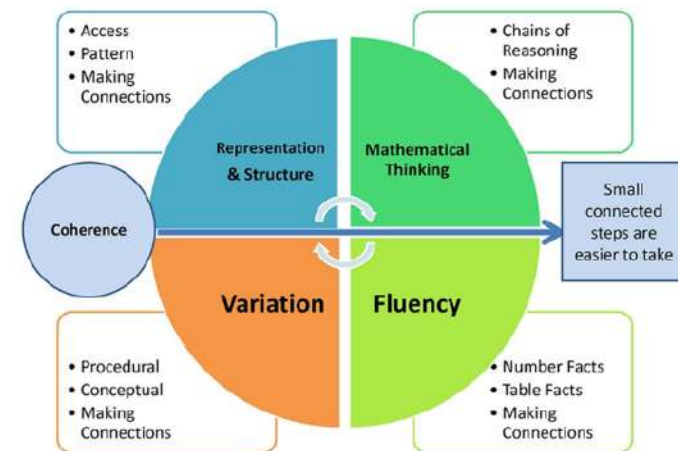
NCETM PD Materials

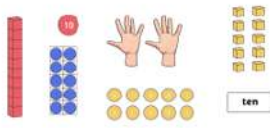
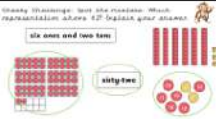
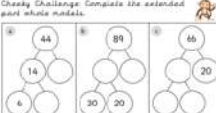
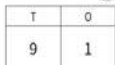
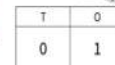
Spine 1: Addition and Subtraction

1.9 Composition of numbers: 20-100
(Revisit Y1 Place Value to 100)

Spine 2: Multiplication and Division

2.1 Counting, unitising and coins
(Count in 2s, 5s, 10s)



Lesson	Do Now	New Learning	Let's Explore	Teach	Independent Tasks	Cheeky Challenge						
5.9.22	Knowledge Organiser and Pre Assessment Task / Pre Learning Tasks											
6.9.22 LO: I can represent numbers to 20	White Rose Flashback 4.	Chn complete Q1-4 on WBs. Review/discuss together.  Complete the number track.  Have a think How did you work out the missing numbers? How can we represent numbers?	Make each number in three different ways. E.g. part whole model / bar model / PV counters. Explore different representations together.	Sam has made a number.  I have one bundle of 10 straws and 7 extra. Sam I know! Your number is ten seven.  Do you agree with Tiny? Explain why. Have a think  Work through the examples together and the different representations that are used.	Chn to complete independent tasks in maths books. Focus on chn completing number sequences and using mathematical vocabulary to explain answers/reason.	Complete the table. <table><tr><th>Less than 30</th><th>Between 30 and 60</th><th>More than 60</th></tr><tr><td></td><td></td><td></td></tr></table> Seventy thirty-three fifty-one eight twenty-nine ninety seventy-one	Less than 30	Between 30 and 60	More than 60			
Less than 30	Between 30 and 60	More than 60										
7.9.22 LO: I can count objects to 100 by making 10s	White Rose Flashback 4.	How many muffins are there? How did you count them? Discuss the best way of representing numbers to help with counting.	How many ways can you represent 10? 	Continue with counting - straw bundles. Counting in 10s each time. Chn to use rekenreks to make numbers of their own.	Chn to complete independent tasks in maths books. LH/JM support pupils with tasks where needed. Use of manipulatives/practical resources.							
8.9.22 LO: I can recognise tens and ones	Retrieval task.	Look at two different representations of 10. What is the same? What is different?	Represent the numbers John can show using base 10. Is he correct? Why/why not?	Look at the tens and ones. Chn to use WBs to show how many different part whole models they can make from them .	Focus on PS/R and chn explain their answers.	Chn to complete the extended part whole models. 						
9.9.22 LO: I can use a place value chart	Primary Stars Consolidation Cards	Representations within place value charts. How many ones are there? How many tens are there?	Use any combination of the base 10 and the place value chart. Chn to create 6 different 2-digit numbers and record these as a number sentence.	 2.a. Joe is representing a number on a place value chart. My chart shows 91. Is Joe correct? Explain why.  2.b. Millie is representing a number on a place value chart. My chart shows 1. Is Millie correct? Explain why.	Chn to complete independent tasks in maths books. Focus on chn using place value chart to represent 2-digit numbers.	Look at the place value chart. Explain the mistake Tiny has made.						

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Variation - Procedural and conceptual variation to draw learners attention to invariants .
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Mathematical Thinking - Relying on reasoning, rather than counting, to solve problems.



Mathematical Concept: ✓ Identify, represent and estimate numbers using different representations. 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 4, 8, 50 and 100			Pre-Assessment Notes: Pre-Assessment Task: Task 1 - Y1 objectives Task 2/3 - Y2 objectives Task 4 - Y3 objective			Pre-Learning: Share knowledge organiser with pupils and link to working wall. Children to have copies of KO in books to reference throughout the unit of work. Focus on vocabulary to explore meanings of new words.	
White Rose Small Steps: □ Represent numbers to 100 (R) □ Tens and ones using addition (R) □ Hundreds □ Represent numbers to 1,000 □ 100s, 10s and 1s □ Number line to 1,000 □ Find 1, 10, 100 more or less than a given number □ Compare objects to 1,000 □ Compare numbers to 1,000 □ Order numbers □ Count in 50s			Ready-To-Progress Criteria: 3NPV-1 Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three-digit multiples of 10.3NPV-2 Recognise the place value of each digit in three-digit numbers, and compose and decompose three-digit numbers using standard and non-standard partitioning.3NPV-3 Reason about the location of any three-digit number in the linear number system, including identifying the previous and next multiple of 100 and 10. 3NPV-4 Divide 100 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal parts.			Key Vocabulary: Hundreds, tens, ones, zero, place value, greater than, less than, order, more, less, partition, digit	
			NCETM PD Materials: Spine 1: Addition and Subtraction1.17Composition and calculation: 100 and bridging 100 (TP 1)1.18Composition and calculation: three-digit numbers(TP 2-4)				
Lesson	Do Now (Starter)	New Learning (Teach)	Let's Explore (Plain page in books - up to 3 questions)	Develop Learning (Teach)	Independent Task (Application carefully thought out questions to challenge the children)	Plenary	

I can represent numbers to 100. Tuesday 6th	Children to complete pre assessment task.	Recap numbers to 100. Ask: What is 1 more than 56? What is one less than 23? Discuss that numbers are made up of tens and ones. The number 56 shows 5 <u>tens</u> and 6 ones. Ask children, how many tens are there in 36? How many ones are there in 28? In the number 67, which number represents the tens? Which number represents the ones? Etc.	Children to use base 10 equipment to find numbers up to 100. Can you make 13? Can you make 25? Can you make 36? Can you draw 63? Can you draw 89?	Introduce reasoning and problem-solving questions. True or false questions. What is the same, what is different questions. Order numbers from smallest to greatest. Number line questions.	Children to complete independent tasks. Varied questions to deepen learning and understanding.	Talk to a partner- what have you learnt today?
I can partition using tens and ones. Wednesday 7th	Base 10 activity.	Children use part whole model to explore how numbers can be partitioned in different ways and then added back together to make a total. Start by partitioning into tens and ones. Children should recognise that $42 = 40 + 2$.	Children complete a number of whole part models by partitioning numbers into tens and ones, then, completing number sentences to match.	Children will see numbers partitioned in different ways eg. 34 as 20 and 14 rather than just 30 and 4. Base ten to help with understanding.	Children to complete independent tasks. Varied questions to deepen learning and understanding.	True or false questions.
I know my 100s. Thursday 8th	Partition activity including number sentences.	Children explore 100 explicitly. Children must understand that 10 tens make 100 and 100 ones make 100. Hold 3 tens sticks. What does this represent? What do 8 tens sticks represent? What do 10 tens sticks represent?	Find 90. How many tens sticks is this? Find 40. How many tens sticks is this? Find 20. How many tens sticks is this? Find 100. How many tens sticks is this?	Children will count objects in multiples of 100 up to 1000. Ask: who can count in their hundreds up to 1000? Go around the room asking a different child each time to say the next number in the sequence. Introduce reasoning and problem-solving questions. Ask questions such as there are 100 sweets in each jar. There are 4 jars. How many sweets do I have?	Children to complete independent tasks. Varied questions to deepen learning and understanding.	What have you learnt today?
I can represent numbers to 1000.	Complete number tracks up to 1000.	Children will use base ten to become familiar with any number up to 1000. Children should understand	Children use base 10 to make different 3-digit numbers.	Introduce reasoning and problem-solving questions. Children to see uncompleted base 10	Children to complete independent tasks.	Reasoning question as a class.

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Mathematical Concept: Place Value

In this unit, children will recognise the place value of each digit in a four-digit number and continue to order and compare numbers up to 10,000 using mathematical vocabulary and symbols. They will identify, represent and estimate numbers using different representations and will round numbers to the nearest 100 and 1000. Children will focus on counting from 0 in multiples of 6, 7, 9, 25 and 1000; count backwards through zero to include negative numbers; and find 1000 more or less than a given number. They will begin to read Roman numerals up to 100. Finally, children will have the opportunity to use all their number and place value skills to solve a range of problems.

White Rose Small Steps:

Represent numbers to 1,000
Partition numbers to 1,000
Number line to 1,000
Thousands
Represent numbers to 10,000
Partition numbers to 10,000
Flexible partitioning of numbers to 10,000
Find 1, 10, 100, 1,000 more or less
Number line to 10,000
Estimate on a number line to 10,000
Compare numbers to 10,000
Order numbers to 10,000
Roman numerals
Round to the nearest 10
Round to the nearest 100
Round to the nearest 1,000
Round to the nearest 10, 100 or 1,000

Pre-Assessment Notes:

Pre-Assessment Task:

Task 1 – Y3 objectives

Task 2/3 – Y4 objectives

Task 4 – Y5 objective

Pre-Learning:

Share knowledge organiser with pupils and link to working wall. Chn to have copies of KO in books to reference throughout the unit of work.

Focus on vocabulary to explore meanings of new words.

Year 3 conceptual prerequisite:

Children know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10.

Divide 100 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal parts.

Recognise the place value of each digit in three-digit numbers and compose and decompose three-digit numbers using standard and non-standard partitioning.

Ready-To-Progress Criteria:

4NPV-1 Know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100; apply this to identify and work out how many 100s there are in other four-digit multiples of 100.

4NPV-2 Recognise the place value of each digit in four-digit numbers, and compose and decompose four-digit numbers using standard and non-standard partitioning.

4NPV-3 Reason about the location of any four-digit number in the linear number system, including identifying the previous and next multiple of 1,000 and 100, and rounding to the nearest of each.

NCETM PD Materials:

Spine 1: Addition and Subtraction

1.17 Composition and calculation: 100 and bridging 100

1.22 Composition and calculation: 1000 and four-digit numbers

1.27 Negative numbers: counting, comparing and calculating

Key Vocabulary:

thousands
hundreds
tens
ones
zero
place value
greater than
less than
order
round
rounded to
negative number
partition
digit
Roman numeral

Lesson	Do Now (Starter)	New Learning (Teach)	Let's Explore (Plain page in books - up to 3 questions)	Develop Learning (Teach)	Independent Task (Application carefully thought out questions to challenge the children)	Plenary
Lesson 1 I can represent numbers to 1000.	Count the objects to identify the amount shown.	Recap the value of each digit. Discuss how we can use base 10.	Ch to use base 10 cut outs to make 3 different numbers.	Discuss different ways to represent numbers. Give ch a number to explore. How many different ways can they represent that number? Recall number facts- How many ones make a ten? How many tens make a hundred? How many hundreds make a thousand?	Ch to answer a range of questions.	Go over questions completed and discuss strategies for solving.
Lesson 2 I can partition numbers to 1000.	Ch to use their knowledge of base 10 to identify the numbers represented.	Recap how to say number sentences. Discuss why it is important to put the correct amount in the place value grid.	Ch to solve a reasoning problem. Ch should also prove their answer with various representations.	Go over the value of each digit. Discuss the relationship between numerals and digits.	Ch to answer a range of questions.	Go over questions completed and discuss strategies for solving.
Lesson 3 I understand number lines to 1000.	Ch to recap previous learning. Go over key vocabulary covered so far.	Discuss number lines. Discuss how to read and understand a number line.	Ch to label number lines correctly that start at 0. Represent the numbers in other ways to prove their value is correct.	Remind ch to look at the number at the beginning of the number line- it will not always be 0. Model filling our several number lines.	Ch to answer a range of questions.	Go over questions completed and discuss strategies for solving.
Lesson 4 I understand thousands.	Ch to recap learning from previous lessons.	Go over how to represent 1000. Discuss similarities and differences to	Ch to answer question using their knowledge of 1000s.	Discuss 2 problems and solve together.	Ch to answer a range of questions.	Go over questions completed and discuss strategies for solving.

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Mathematical Concept: Number: Place value			Pre-Assessment Notes: Some gaps with rounding.			Pre-Learning: • Round to the nearest 10 • Round to the nearest 100 • Count in 1000s • 1000s, 100s, 10s and 1s • Number line to 10000 • Compare numbers • Order numbers • Round to the nearest 1000 • Count in 25s • Negative numbers • Roman numerals to 100			
White Rose Small Steps: 1000s, 100s, 10s and 1s (R) □ Numbers to 10,000 □ Rounding to the nearest 10 (R) □ Rounding to the nearest 100 (R) □ Round to nearest 10, 100 and 1,000 □ Numbers to 100,000 □ Compare and order numbers to 100,000 □ Round numbers within 100,000 □ Numbers to a million □ Counting in 10s, 100s, 1,000s, 10,000s, and 100,000s □ Compare and order numbers to one million □ Round numbers to one million □ Negative numbers □ Roman Numerals to 1,000				Ready-To-Progress Criteria: • 5NPV-2 Recognise the place value of each digit in numbers with up to 2 decimal places, and compose and decompose numbers with up to 2 decimal places using standard and non-standard partitioning.			Key Vocabulary: Millions, thousands, hundreds, tens, place value, digits, numerals, greater than, less than, order, round, rounded, negative number, partition, interval, sequence, linear		
				NCETM PD Materials: Spine 1: Addition and Subtraction 1.26 Composition and calculation: Multiples of 1,000 up to 1,000,000					
Lesson	Do Now (Starter)	New Learning (Teach)	Let's Explore (Plain page in books - up to 3 questions)	Develop Learning (Teach)	Independent Task (Application carefully thought out questions to challenge the children)			Plenary	
1	NRICH countdown.	Intro number cards. Show template for addition. What do you notice? There are 9 digits altogether. This means I need to use them all. What operation are we working with? +	Model. Model second challenge.	Chn to work in 2/3 on challenges. Encourage to find as many possible combinations.					

Can you represent these numbers?

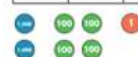
Model second challenge.

<https://www.topmarks.co.uk/place-value/place-value-charts>

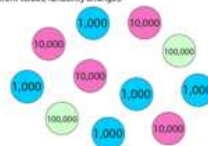
10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000	90,000
1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9

What numbers are represented?

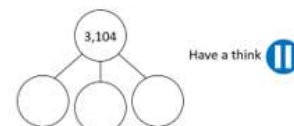
TTh	Th	H	T	O
	1000 1000 1000 1000		10	1 1



What would a. be if I added another counter to the thousands column?



TTh	Th	H	T	O
	●● ●	●		●● ●●


$$3,741 + 100 = 3,841$$

Th	H	T	G
1000	1000	1000	1
1000	1000	1000	
	1000		
	1000		
	1000		

$$3,711 - 10 =$$

Th	H	T	O
			
3,000	700	0	1

Have a think

	1 more	10 more	100 more	1,000 more
5,000	5,001	5,010	5,100	6,000
			6,530	

Complete the part-whole models.



What is the value of the 7 in each number?

a) 3,071 b) 307 c) 7,004 d) 5,711

Complete the table.

	1 more	10 more	100 more	1,000 more
3,000				
7,213				
	4,511			
		1,291		
				2,899
			6,059	

a) Draw an arrow to 3.009 on the number line



b) Draw an arrow to 2,500 on the number line



CC:

a) Alex makes a number on a place value chart.

- Her number has a digit total of 17
- There are 2 more counters in the hundreds column than the thousands column.

What numbers could Alex have made?

b) Make a number and write a list of clues to describe it.

Describe your number to your partner. Can they guess it?

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Mathematical Concept: Place Value	Pre-Assessment Notes: Recap numbers to 10 million to ensure understanding is secure. Pre-Assessment Task: Task 1 – Y5 objectives Task 2/3 – Y6 objectives Task 4 – Y7 objective		Pre-Learning: Share knowledge organiser with pupils and link to working wall. Chn to have copies of knowledge organiser in books to reference throughout the unit of work. Focus on vocabulary to explore meanings of new words.
White Rose Small Steps: - Numbers to 10,000 (R) - Numbers to 100,000 (R) - Numbers to a million (R) - Numbers to ten million - Compare and order any number - Round numbers to 10, 100 and 1,000 (R) - Round any number - Negative numbers	Ready-To-Progress Criteria: NPV-2 Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non- standard partitioning. 6NPV-3 Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts.	Key Vocabulary: Order, compare, negative number greater than ($\geq$), less than ($\leq$), equal to ($=$), rounding, estimate, approximately, tens, hundreds, thousands, millions, digit, tenths, hundredths, thousandths, integer, ascending, descending, interval, multiple, factor, product, square number, cube number, prime number, decimal point, decimal place, Roman numerals.	
	NCETM PD Materials: Spine 1: Addition and Subtraction 1.26 Composition and calculation: Multiples of 1,000 up to 1,000,000 <i>*Revisit place value from Y5</i> 1.30 Composition and calculation: numbers up to 10,000,000 (TP 2, 3 and 5)		
National Curriculum Links: - read, write, order and compare numbers up to 10,000,000 and determine the value of each digit - round any whole number to a required degree of accuracy - use negative numbers in context, and calculate intervals across 0 - solve number and practical problems that involve all of the above			

Lesson	Do Now <i>(Starter)</i>	New Learning <i>(Teach)</i>	Let's Explore <i>(Plain page in books - up to 3 questions)</i>	Develop Learning <i>(Teach)</i>	Independent Task <i>(Application of carefully considered questions to challenge the children)</i>	Plenary
1. I can read and write numbers to 10 million.	Recap of writing numbers as words and digits.	How would 'four million, four hundred and thirty-two thousand, five-hundred and four' be written in digits? Ensure chn understand the use of commas in numbers and that within the PV chart there are number 'families' that are grouped together. Comparing numbers - what is the same and what is different? Activity with a range of numbers. Chn have to look closely at place value columns and what each is worth. Part-whole models - how do they work? Fill in the missing information using PV knowledge.	Make numbers using PV counters and a PV chart. What does it look like? How many counters are needed in each column? Value of underlined digits - what is each digit worth? Ensure chn recognise that the digit 4 in the number 32,409 isn't just a 4 - it is 4 hundreds.	Write the numbers represented in PV charts - applying understanding of use of commas. What do you know about the number? Which PV column has the biggest/smallest digit?	A range of questions to apply skills learnt through lesson - knowing how to interpret and represent numbers to 10 million.	Go through answers & challenge - address any misconceptions and assess children's understanding.
2. I can compare and order numbers to 10 million.	Recap on PV understanding and use of <, > and =.	What do the representations all have in common? Chn to work out the value shown in the representations - PV chart, PV counters, roman numerals and words. Compare the counters in the PV charts and use the correct symbol <, > or =. Encourage chn to explain their reasoning - how do you know? How does it work? Do you have to look at ALL PV columns before knowing which symbol to use? Which PV columns are most important to look at? Why?	If a number starts with a larger digit, will that always mean it is the bigger number? Think, pair, share. Ensure chn recognise that it is not necessarily the biggest digit that will be worth more - show examples e.g. 9 in the thousands columns is worth less than 1 in the ten thousands column.	Fill in the missing numbers to make the <, > and = symbols correct. Go over key vocabulary of 'ascending' and 'descending' - what does it mean? What does it look like?	A range of questions to apply skills learnt through lesson - comparing and ordering numbers to 10 million in a range of formats.	Go through answers & challenge - address any misconceptions and assess children's understanding.

Mathematics End Points



Stretton St Matthew's
C.E. Primary School

Year 1 Curriculum End Points

Autumn	Spring	Summer
Place Value - Week 1-5 - Count to 10 forwards and backwards beginning with 0 or 1 or from any given number - Count, read and write numerals to 10 in numerals and words - Given a number, identify one more or one less - Identify and represent numbers using objects and pictorial representation including a number line and use the language of equal to, more than, less than, (fewer) most, least	Place Value (within 20) - Week 1-3 - Count to 20 forwards and backwards from any given number - Count, read and write numbers to 20 in numerals and words - Given a number identify one more or one less - Identify and represent numbers using objects and pictorial representation including a number line and use the language of equal to, more than, less than, (fewer) most, least	Multiplication and Division - Week 1-3 - Count in multiples of 2's, 5's and 10's - Solve one step problems involving multiplication and division by calculating the answer using concrete objects, pictorial representations and arrays
Addition and Subtraction - Week 6-10 - Represent and use number bonds and related subtraction facts within 10 - Read, write and interpret mathematical statements involving addition, subtraction and equal signs - Add and subtract one-digit numbers to 10 including 0 - Solve one step problems that involve addition and subtraction using concrete objects and pictorial representation and missing number problems	Addition and Subtraction - Week 4-6 - Represent and use number bonds and related subtraction facts within 20. - Read, write and interpret mathematical statements involving addition, subtraction and equal signs - Add and subtract one-digit numbers to 20 including 0 - Solve one step problems that involve addition and subtraction using concrete objects and pictorial 7=? -9	Fractions - Week 4-5 - 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 - Compare, describe and solve practical problems for lengths and heights, e.g. long/short, longer/shorter, tall/short, double/half - Compare, describe and solve practical problems for mass and weights, e.g. heavy/light, heavier than/lighter than, Capacity and volume e.g. full/empty, more than, less than, half, half full, quarter
Geometry: Shape – Week 11 - Recognise and name common 2-D shapes e.g. square, circle and triangles - Recognise and name common 3-D shapes e.g. Cuboids, cubes, pyramids and spheres	Place Value (within 50) - Week 7-8 - Count to 50 forwards and backwards beginning with 0 or 1 or from any given number - Count, read and write numerals to 50 in numerals and words - Given a number, identify one more or one less - Identify and represent numbers using objects and pictorial representation including a number line and use the language of equal to, more than, less than, (fewer) most, least - Count in multiples of 2's, 5's and 10's	Geometry: Position and Direction- Week 6 Describe position, direction and movement including whole, half, quarter and three-quarter turns
Consolidation – Week 12	Measurement: Length and Height - Week 9-10	Place Value to 100 – Week 7-8

	• Measure and begin to record lengths and heights • Compare, describe and solve practical problems for lengths and heights e.g. long/short, longer/shorter, tall/short, double/half	• Count to 100 forwards and backwards beginning with 0 or 1 or from any given number • Count, read and write numerals to 100 in numerals and words • Given a number, identify one more or one less • Identify and represent numbers using objects and pictorial representation including a number line and use the language of equal to, more than, less than, (fewer) most, least
	Measurement: Weight and Volume- Week 11-12 • Measure and begin to record mass/weight, capacity and volume • Compare, describe and solve practical problems for mass/weight e.g. heavy/light, heavier than/lighter than, capacity and volume e.g. full/empty, more than/less than, half, half full, quarter	Measurement: Money - Week 9 • Recognise and know the value of different denominations of coins and notes
		Measurement: Time - Week 10-12 • Sequence events in chronological order using language eg before, 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 hands on a clock face to show these times • Compare, describe and solve practical problems for time e.g. quicker, slower, earlier, later • Measure and begin to record time e.g. hours, minutes seconds

Year 2 Curriculum End Points

Autumn	Spring	Summer
Place Value – Week 1-4 • Read and write numbers to at least 100 in numerals and words. • Recognise the place value of each digit in a 2-digit number (tens & ones) • Identify, represent and estimate numbers using different representations including the number line. • Compare and order numbers from 0 – 100; use < > and = signs. • Use place value and number facts to solve problems • Count in steps of 2,3, 5 and tens from any number forwards and backwards	Measurement: Money – Week 1-2 • Recognise and use symbols for pounds and pence (£/p) • Combine amounts to make a particular value • Find different combinations of coins that make the same amount of money • Solve simple problems practically, including addition and subtraction and giving change.	Fractions – Week 1-3 • 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 $\frac{1}{2}$.
Addition and Subtraction – Week 5-9 • Recall and use addition & subtraction facts to 20 fluently. Derive and use related facts up to 100. • Add & subtract numbers using concrete objects, pictorial representations and mentally, including two digit numbers and ones, two digit numbers and tens, two digit number and two digit number and adding 3 one digit numbers. • Show that the addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot. • Solve problems with addition and subtraction: using concrete objects and pictorial representations. Include problems involving numbers, quantities and measures. • Recognise and use the inverse relationship between addition and subtraction. Use this to check calculations and solve missing number problems	Multiplication and Division - Week 3-7 • Recall and use multiplication facts for 2, 5 and 10 times tables including recognising odd and even numbers • Calculate mathematical statements for 2, 5 and 10's using multiplication and division using $\times$, $\div$ and = • Solve problems using multiplication and division using, materials, arrays, repeated addition and mental methods. • Show that multiplication of two numbers can be done in any order (commutative) but division cannot.	Measurement: Time – Week 4-6 • Tell and write the time to five minutes, including quarter past/to the hour. • Draw hands on a clock 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
Geometry: Properties of Shape – Week 10-12 • Identify and describe the properties of 2D shapes, including the number of sides and line symmetry in a vertical line	Measurement: Length and Height – Week 8-9 • Choose and use appropriate standards of units to estimate and measure length/height (m/cm) in any direction; mass (kg/g), temperature ($^{\circ}$C), capacity	Statistics – Week 7-8 • Interpret and construct simple pictograms, tally charts, block diagrams and simple tables • Ask and answer simple questions by counting the

• Identify and describe the properties of 3D shapes, including the number of edges, vertices and faces. • Identify 2D shapes on the surface of 3D shapes e.g a circle on a cylinder and a triangle on a pyramid. • Compare and sort common 2D and 3D shapes and everyday objects.	(l/ml). • Use rulers, scales thermometers and measuring vessels to the nearest unit. • Compare and order lengths, mass, volume/capacity and record the results using < > and =	number of objects in each category and sorting the categories by quantity • Ask and answer questions about totaling and comparing categorical data.
	Measurement: Mass, Capacity and Temperature – Week 10- 12 • Choose and use appropriate standards of units to estimate and measure length/height (m/cm) in any direction; mass (kg/g), temperature (°C), capacity (l/ml). • Use rulers, scales thermometers and measuring vessels to the nearest unit. • Compare and order lengths, mass, volume/capacity and record the results using < > and =	Geometry: Position and Direction – Week 9-10 • Use mathematical vocabulary to describe position, direction and movement including in a straight line. • Distinguish 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 Curriculum End Points

Autumn	Spring	Summer
Place Value – Week 1-3 • Recognise the place value of each digit in a three-digit number • Identify, represent and estimate using different representations • Find 10 or 100 more or less than a given number • Compare and order numbers up to 1000 • Read and write numbers in numerals and words up to 1000 • Solve number problems and practical problems involving these ideas. • Count from 0 in multiples of 4, 8, 50 and 100.	Multiplication and Division – Week 1-3 • Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables. • Write and calculate multiplication and division statements for the tables known including 2 digits times 1-digit numbers using mental and formal written methods • Solve problems, including missing numbers involving multiplication and division. • Solve problems including positive integer scaling and correspondence problems in which n objects are connected to m objects	Fractions – Week 1-2 • Recognise and show, using diagrams, equivalent fractions with small denominators • Compare and order unit fractions, and fractions with the same denominators • Add and subtract fractions with the same denominator within one whole. • Solve problems that involve all the above
Addition and Subtraction – Week 4-8 • Add and subtract numbers mentally including: 3 digits and ones, 3 digits and tens, 3 digits and hundreds. • Add and subtract numbers with up to 3 digits using formal written methods of columnar addition and subtraction • Estimate the answer to a calculation and use inverse operations to check answers • Solve problems, including missing numbers, using number facts, place value and more complex addition and subtraction.	Measurement: Length and Perimeter – Week 4-6 • Measure, compare, add and subtract lengths (m/cm/mm), mass (kg/g) and volume/capacity (l/ml) • Measure the perimeter of simple 2D shapes.	Measurement: Money – Week 3-4 • Add and subtract amounts of money to give change using £ and p in practical contexts.
Multiplication and Division – Week 9-11 • 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. • Write and calculate multiplication and division statements for the tables known including 2 digits times 1-digit numbers using mental and formal written methods • Solve problems, including missing numbers involving multiplication and division. • Solve problems including positive integer	Fractions – Week 7-9 • 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 use fractions as numbers, unit and non-unit fractions with small denominators. • Recognise, find and write fractions of a discrete set of objects, unit and non-unit fractions with small denominators. • Solve problems that involve all the above.	Measurement: Time – Week 5-7 • Tell and write the time from an analogue clock • Tell and write the time from an analogue clock with Roman Numerals I to XII • Tell the 12 hour and 24-hour time • Estimate and read time with increasing accuracy to the nearest minute • Record and compare time in terms of seconds, minutes and hours • Use vocabulary such as o'clock, am/pm, morning, afternoon, noon and midnight • Know the number of seconds in a minute

scaling and correspondence problems in which n objects are connected to m objects		• Know the number of days in each month • Know the number of days in a year and leap year • Compare durations of events (time taken by particular events or tasks)
Consolidation – Week 12	Measurement: Mass and Capacity – Week 10-12 • Measure, compare, add and subtract lengths (m/cm/mm), mass (kg/g) and volume/capacity (l/ml)	Geometry: Properties of Shape – Week 8-9 • Recognise angles as a property of shape or a description of a turn • Identify right angles • Recognise that 2 right angles make a half turn, 3 make three quarters of a turn, and 4 make a complete turn • Identify whether angles are greater than or less than a right angle • Identify horizontal and vertical lines. • Identify pairs of perpendicular and parallel lines • Draw 2D shapes and make 3D shapes using modelling material • Recognise 3D shapes in different orientations and describe them
		Statistics – Week 10-11 • Interpret and present data using bar charts, pictograms and tables • Using information presented in scaled bar charts, pictograms and tables, solve one step and two step questions e.g How many more? How many fewer?

Year 4 Curriculum End Points

Autumn	Spring	Summer
Place Value -Week 1-4 - Count in multiples of 6, 7, 9, 25 and 1000 - Find 1000 more or less than a given number - Recognise the place value of each digit in a 4-digit number - Order and compare numbers beyond 1000 - Identify, represent and estimate numbers using different representations - Round any number to the nearest 10, 100 and 1000 - Count backwards through zero to negative numbers - Solve number and practical problems will all of the above.	Multiplication and Division – Week 1-3 - Recognise and use factor pairs and commutativity in mental calculations - Multiply 2 digit and 3-digit numbers by a one-digit number using formal written layout - Solve problems involving multiplying and adding including using the distributive law to multiply 2-digit numbers by 1 digit; integer scaling problems and correspondence problems such as n objects are connected to m objects	Decimals -Week 1-2 - Compare numbers with the same number of decimal places up to two decimal places. - Round decimals with one decimal place to the nearest whole number. - Recognise and write decimal equivalents to $\frac{1}{4}$ $\frac{1}{2}$ and $\frac{3}{4}$ - Understand the effect of dividing a one- or two-digit number by 10 or 100. - Identifying the value of the digits in the answer as ones, tenths and hundredths.
Addition and Subtraction – Week 5-7 - Add and subtract numbers with up to 4 digits using the formal written method 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 context, deciding which operations and methods to use and why.	Measurement: Length and Perimeter – Week 4-5 - Measure and calculate the perimeter of a rectilinear figure (including squares) in cm and m - Convert between different units of measure e.g. km to m	Measurement: Money - Week 3-4 - Estimate, compare and calculate different measures, including money in pounds and pence. - Solve simple measure and money problems involving fractions and decimals to two decimal places.
Measurement: Area – Week 8 Find the area of rectilinear shapes by counting squares	Fractions – Week 6-9 - 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 - Add and subtract fractions with the same denominator - 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	Measurement: Time – Week 5-7 - Read, write and convert time between analogue and digital 12- and 24-hour clocks. - Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.
Multiplication and Division – Week 9-11 Recall and use multiplication and division	Decimals – Week 10-12 Recognise and write decimal equivalents of any	Geometry: Properties of Shape – Week 8-9 Identify acute and obtuse angles

facts for multiplication tables up to 12 X 12 • Count in multiples of 6, 7, 9, 25 and 1000 • 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 • Solve problems involving multiplying and adding including using the distributive law to multiply 2-digit numbers by 1 digit; integer scaling problems and correspondence problems such as n objects are connected to m objects	number of tenths or hundredths. • Find the effect of dividing a one- or two-digit number by 10 or 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 two decimal places. • Convert between different units of measure [for example, kilometre to metre]	• Compare and order angles up to 2 right angles by size • Compare and classify geometric shapes including quadrilaterals and triangles, based on their properties and size. • Identify lines of symmetry in 2D shapes presented in different orientations
Consolidation – Week 12		Statistics – Week 10 • 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.
		Geometry: Position and Direction – Week 11-12 • Describe on a 2D 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.

Year 5 Curriculum End Points

Autumn	Spring	Summer
Place Value – Week 1-3 • Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit • Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 • Interpret negative numbers in context • Count forwards and backwards with positive and negative whole numbers including through zero • Round any number up to 1,000,000 to the nearest 10, 100,1000, 10,000 and 100,000 • Solve number and practical problems that involve all the above • Read Roman numerals up to 1,000 (M) and recognise years written in Roman numerals	Multiplication and Division – Week 1-3 • Multiply and divide numbers mentally drawing upon known facts. • Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for 2-digit numbers. • Divide numbers up to 4 digits by a 1- digit number using the formal written method of short division and interpret remainders appropriately for the context. • Solve problems involving addition and subtraction, multiplication and division and a combination of these, including understanding the use of the equals sign.	Geometry: Properties of Shapes – Week 1-3 • 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 $\frac{1}{2}$ a turn (total 180°) other multiples of 90°
Addition and Subtraction – Week 4-5 • 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) • 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 with operations and methods to use and why.	Fractions – Week 4-5 • Compare and order fractions whose denominators are 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	Geometry: Position and Direction – Week 4-5 • 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.
Multiplication and Division – Week 6-8 • Multiply and divide numbers mentally drawing upon known facts • Multiply and divide whole numbers by 10, 100 and 1000 • Identify multiples and factors • Find all factor pairs of a number and common factors of 2 numbers	Decimals and Percentages – Week 6-8 • Read, write, order and compare numbers with up to three decimal places. • Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents. • Round decimals with two decimal places to the nearest whole number and to one decimal place.	Decimals – Week 6-8 • Recognise and write decimal equivalents of any number of tenths or hundredths. • Find the effect of dividing a one- or two-digit number by 10 or 100, identifying the value of the digits in the answer as ones, tenths and hundredths • Solve simple measure and money problems

• Recognise and use square numbers and cube numbers using the notations (<i>e. g</i> 3^2 and 4^3) • Solve problems involving multiplication and division including using knowledge of factors and multiples, squares and cubes • Know and use vocabulary of prime numbers, prime factors and composite (non-prime) numbers • Establish whether a number up to 100 is a prime and recall prime numbers up to 19	• Solve problems involving number up to three decimal places. • Recognise the percent symbol (%) and understand that percent relates to 'number of parts per hundred', • Write percentages as a fraction with denominator 100, and as a decimal. • Solve problems which require knowing percentage and decimal equivalents of and those fractions with a denominator of a multiple of 10 or 25	involving fractions and decimals to two decimal places. • Convert between different units of measure [for example, kilometre to metre]
Fractions – Week 9-12 • Add and subtract fractions with the same denominator and denominators that are multiples of the same number.	Measurement: Perimeter and Area – Week 9-10 • Measure and calculate the perimeter of composite rectilinear shapes in cm and m • Calculate and compare the area of rectangles (including squares) using standard units cm^2/m^2 • Estimate the area of irregular shapes	Negative Numbers – Week 9 • Interpret numbers greater than and less than zero in different contexts. • Identify and place negative numbers on a number line • Interpret sets of negative and positive numbers in a range of contexts • Use their knowledge of positive and negative numbers to calculate intervals
	Statistics – Week 11-12 • Solve comparison, sum and difference problems using information presented in a line graph. • Complete, read and interpret information in tables including timetables.	Measuring: Converting Units – Week 10-11 • Convert between different units of metric measure [for example, km and m; cm and m; cm and mm; g and kg; l and ml] • Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints. • Solve problems involving converting between units of time.
		Measurement: Volume – Week 12 • Estimate volume (e.g. using 1cm^3 blocks to build cuboids, including cubes) and capacity (e.g. using water) • Use all 4 operations to solve problems involving measure

Year 6 Curriculum End Points

Autumn	Spring	Summer
Place Value – Week 1-2 • Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit • Round any whole number to a required degree of accuracy • Use negative numbers in context and calculate intervals across zero • Solve number and practical problems that involve all the above	Ratio – Week 1-2 • 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.	Geometry: Properties of Shapes – Week 1-2 • Draw 2-D shapes using given dimensions and angles. • Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals and regular polygons. • Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. • Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius • Recognise, describe and build simple 3-D shapes, including making nets
Four Operations – Week 3-7 • 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 2-digit number using the formal written method of long multiplication • Divide numbers up to 4 digits by a 2-digit whole number using the formal written method of long division. • Divide numbers up to 4 digits by a 2-digit number using the formal written method of short division • Interpret remainders as whole number remainders, fractions or by rounding as appropriate for 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 four operations • Solve problems involving addition, subtraction, multiplication and division. • Use estimation to check answers to calculations and	Algebra - Week 3-4 • Use simple formulae. • Generate and describe linear number sequences. • Express missing number problems algebraically. • Find pairs of numbers that satisfy an equation with two unknowns. • Enumerate possibilities of combinations of two variables.	Geometry: Position and Direction – Week 4 • Describe positions on the full co-ordinate grid (all 4 quadrants) • Draw and translate simple shapes on the co-ordinate plane and reflect them in the axes

determine in context of a problem, an appropriate degree of accuracy		
Fractions – Week 8-11 • Use common factors to simplify fractions • Use common multiples to express fractions in the same denomination • Compare and order fractions, including fractions >1 • Generate and describe linear number sequences (with fractions) • Add and subtract fractions with different denominations and mixed numbers, using the concept of equivalent fractions • Multiply simple pairs of proper fractions writing the answer in its simplest form • Divide proper fractions by whole numbers • Associate a fraction with division and calculate decimal fraction equivalents. • Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts	Decimals – Week 5-6 • Identify the value of each digit in numbers given to 3 decimal places and multiply numbers by 10, 100 and 1,000 giving answers up to 3 decimal places. • Multiply 1-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.	SATS Week Problem Solving and Investigations – Week 5 – 11 Reasoning and problem solving in all aspects of previous learning
Measurement: Converting Units – Week 12 • 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 3 decimal places. • Convert between miles and kilometres.	Fractions, Decimals and Percentages – Week 7-8 • Solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison. • Recall and use equivalences between simple fractions, decimals and percentages including in different contexts.	
	Measurement: Perimeter, Area and Volume – Week 9-10 • Recognise that shapes with the same areas can have different perimeters and vice versa. • Recognise when it is possible to use formulae for area and volume of shapes. • Calculate the area of parallelograms and triangles. • Calculate, estimate and compare volume of cubes and	

	cuboids using standard units, including cm ³ , m ³ and extending to other units (mm ³ , km ³)	
	Statistics – Week 11-12 • Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius. • Interpret and construct pie charts and line graphs and use these to solve problems. • Calculate the mean as an average.	

SMSC in Mathematics at St Matthew's



	We promote spiritual development by...	We promote moral development by...	We promote social development by...	We promote cultural development by...
Maths	Children are engaged in deeper thinking with regards to problem solving. There is a sense of wonder in the exactness of mathematics as well as a sense of personal achievement in solving problem. Making connections between pupils' numeracy skills and real life.	Maths encourages children to look at, discuss and evaluate a range of social and moral issues in the world. It can sometimes draw upon other areas of study such as history and geography.	A requirement for verbal reasoning. Working in groups or teams to solve problems. Sharing resources. Children have the opportunity to discuss their learning with their peers	Maths exposes the children to range of approaches to solving problems and reasoning skills.

Mathematics Vocabulary



Stretton St Matthew's
C.E. Primary School

	1	2	3	4	5	6
Autumn A	one more, one less, equal to, more than, less than, most, least, total, count, symbol, add, more, plus, make, altogether, subtract, take away, less, equals,	<u>Place Value</u> represents, greater than/less than, more than, fewer, most, least, equal to, tens and ones <u>Addition and Subtraction</u> Add, more, plus, sum, total, equals, tens and ones, number line, take away, subtract, minus, less, leave	<u>Place Value</u> Compare, greater than >, less than <, numeral, place value, ones, tens, hundreds, digit, count in fifties, represent, increase, decrease	<u>Place value:</u> Increase, decrease, rounding, nearest, negative number, compare, order, digit, sequence, place value, ones, tens, hundreds, thousands <u>Addition/subtraction:</u> Add, addition, subtract, subtraction, calculate, calculation, mental calculation, written method, operation, total, amount, exchange, regroup	add/addition subtract/subtraction calculate/calculation mental calculation written method operation, total amount, exchange, regroup, inverse, estimate increase/decrease, less than/greater than, equal to, rounding, nearest, negative number, compare, order, partitioning, place value, ones, tens, hundreds, thousands, ten thousands, hundred thousands, actor, multiple, prime number, square number, squared, cube number, cubed	<u>Place Value:</u> increase/decrease, less than/greater than, equal to, rounding, nearest, negative number, compare, order, partitioning, place value, Part, part whole, ones, tens, hundreds, thousands, ten thousands, hundred thousands, millions, ten million <u>Addition & Subtraction</u> calculate/calculation, mental calculation, written method, Invers, estimate, operation, total, amount, exchange, regroup calculate/calculation, mental calculation , written method, Inverse, estimate, operation, total, amount, exchange, regroup <u>Multiplication & Division</u> multiply , times, groups of product, lots of, divide, share , equal
Autumn B	number bonds, number line, part-whole model, tens frame, fewer than, equal to, numeral, Circle, Square, Rectangle, Triangle, Cube, Cuboid, Pyramid, Sphere, Cylinder, Cone, 2D shape, 3D shape	<u>Addition and Subtraction</u> Add, more, plus, sum, total, equals, tens and ones, number line, take away, subtract, minus, less, leave <u>Geometry</u> Pentagon, hexagon, sides, curved/straight, edges, vertex/vertices/corners, Faces, cuboid, polygon, symmetry, vertical, horizontal,	<u>Addition and Subtraction</u> add/addition, subtract/subtraction, calculate/calculation, mental calculation, written method, operation, total, amount, exchange, regroup	<u>Area:</u> area, rectilinear, shapes, space, surface, compare, equal to, greater than, less than, order <u>Multiplication/Division:</u> Multiply, multiplication, divide, division, calculate, calculation, mental calculation, operation, commutative	Numerator, denominator, equivalent, mixed number, mproper fraction	<u>Fractions</u> Numerator, denominator, factors, multiples, equivalent, simplify, mixed numbers, proper fractions, improper fractions <u>Measurement</u> metric / imperial, length / mass / volume / capacity, mm / cm / m / km. miles, inches / foot grams / kilograms / tonnes, ounces / pounds / stone litres / millilitres gallons / pints, estimate / approximate, convert
Spring A	Number line, Part-whole model, Tens frame, More than, Less than, Fewer than, Equal to, Most, Least, Total, Count, Numeral, Multiple,	<u>Money</u> Pounds, pence, penny, equal, coins, notes, value, change, equivalent, <u>Multiplication and Division</u>	<u>Multiplication and Division</u> Multiply, times, groups of, lots of, array, divide, share, divide, commutativity	<u>Multiplication/Division:</u> Remainder, factor, factor pairs, efficient, exchange, commutative <u>Length and Perimeter:</u> Convert, distance, kilometre, length, measure, metre,	Decimal, numerator, denominator, equivalent, mixed number, improper fraction	<u>Ratio</u> ratio / proportion quantity / value 'for every' part / whole symbol / colon scale factor / enlargement fraction / numerator / denominator <u>Algebra</u>

		equal groups, grouping, sharing, lots of, groups of, array, divide, multiply, multiple		perimeter, rectangle, rectilinear, width		algebra formulae express equation rule function input / output substitute integer value variable <u>Decimals</u> decimal fraction equivalent convert value digit integer round tenths / hundredths / thousandths <u>Decimals, fractions & percentages</u> percentage decimal fraction equivalent convert amount value
Spring B	Length, height, centimetres, mass, weight, capacity, volume, long, longer, short, shorter, tall, taller, heavy, heavier, light, lighter, equal,	<u>Measurement</u> metres/centimetres(m/cm), kilograms/grams (kg/g), litres/millilitres (l/ml), degrees Celsius, more than, less than, taller/tallest, longer/longest, short/shortest, heavier/lighter/heaviest/lightest, warm/cold/warmer/colder	<u>Fractions</u> Fraction, numerator, denominator, equivalent, unit fraction, tenths	<u>Fractions:</u> fraction, numerator, denominator, equivalent, unit fraction, hundredths, tenths <u>Decimals:</u> decimal, decimal place, tenths, hundredths, round, compare	decimal, numerator, denominator, equivalent, mixed number, improper fraction	<u>Area perimeter & Volume</u> area / perimeter / volume rectilinear formula / formulae approximate estimate base perpendicular parallelogram / triangle cubic units cube / cuboid <u>Shape</u> 2D / 3D shapes nets acute / right / obtuse / reflex angle vertically opposite angle protractor compass triangle quadrilateral polygon circle radius diameter circumference <u>Position & Direction</u> position direction coordinates quadrants shapes translate units plane reflect axis axes
Summer A	Equal groups, Equal rows, Grouping, Sharing, Doubles, Halves, Count in (2s, 5s, 10s), Lots of, Groups of, Array, Equal, Whole, Parts, Half/ halve, Quarter, Share, forwards, backwards, left, right, up, down, top, middle, bottom, on top of, above, between, around, near, close	<u>Fractions</u> Equal, whole, parts, half/halve, quarter, third, divided, unit fraction, equivalent <u>Time</u> quarter past, half past, quarter to, o'clock, minutes, hour, half an hour	<u>Fractions (as above)</u> <u>Money</u> pounds, pence, penny, equal, coins / notes, value, amount, equivalent, add / subtract, change	<u>Money:</u> pounds, pence, coins, notes, value, amount, total, change, estimate, convert, compare, order <u>Time:</u> analogue, digital, convert, duration, 12- hour clock, 24-hour clock, hour, minute, second, day, week, month, year	2D/3D regular/irregular acute /obtuse/ reflex angles degree protractor inside/outside scales position, direction, coordinates, axis axes , origin, x-axis/ y-axis, vertices/vertex, quadrant, scale, plot, movement, translation, left/ right/ up/ down, reflection, mirror line	

Summer B	number line, number track, part-whole model, tens frame, more, less than, fewer, equal to • most, least, count, numeral, multiple, Pence, Pound Coin, Note, Value, Worth, Greater than, Less than, The same as, Hour, Minutes, Seconds, Before, After, First, Next, Earlier, Later, Quicker, Slower, Yesterday, Today, Tomorrow, Morning, Afternoon, Evening, Days of the week, Months of the year., O'clock, Half past	<u>Position and Direction</u> Forwards, backwards, left, right, north, south, east, west, quarter turn, half turn, three-quarter turn, clockwise, anticlockwise, pattern, sequence <u>Statistics</u> Pictogram, tally chart, table, total, compare, scale, data, record, most/least, popular	Shapes Edge Apex Faces Vertices Dimension Quarter/Three-Quarter Turn Right Angle Obtuse Acute Horizontal Vertical Parallel Perpendicular	Shape: acute, right, obtuse, polygon, triangle, equilateral, scalene, isosceles, right-angles, quadrilateral, parallelogram, rhombus, trapezium, regular, irregular, parallel, perpendicular, symmetry, symmetrical, Statistics: discrete, continuous, bar chart, pictogram, time/line graph, comparison, sum, difference, scale, axis, axes	metric/imperial, length/mass/ volume/capacity, millimetres / centimetres/ metres/kilometres, inches, grams/ kilograms, pounds, litres/millilitres, pints, estimate/ approximate, convert volume, capacity, cubic measures / cm^3 / m^3, millilitres, estimate	
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Knowledge Organisers (Examples)



Stretton St Matthew's
C.E. Primary School

YR1 PLACE VALUE KNOWLEDGE ORGANISER

Key Concepts

- Sort objects
- Count objects
- Read and write numbers up to 10 in numerals and in words
- Find one more and one less
- Represent numbers using objects and pictures
- Compare objects

Key Vocabulary

- One more
- One less
- Equal to
- More than
- Less than
- Most
- Least
- Total
- Count



Numbers to 10

1		one		6		six	
2		two		7		seven	
3		three		8		eight	
4		four		9		nine	
5		five		10		ten	

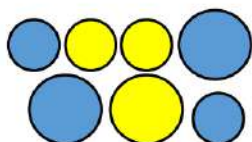


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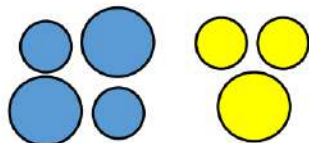
YR1 PLACE VALUE KNOWLEDGE ORGANISER

Sorting Objects

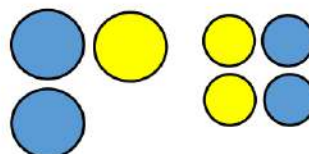
Look at these counters. We can sort them in different ways.



We can sort them by colour, like this...



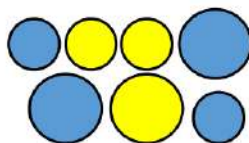
Or we could sort them by size, like this...



Counting Objects

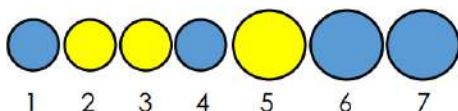


When we count objects, we must start counting from the number 1.



Count the objects one at a time. The last number you say is the total amount.

To help you count, you can put the objects in a line.



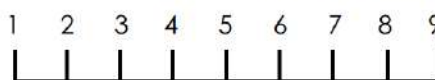
We can now see there are 7 counters in total.



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Finding One More and One Less

When we count, 'one more' is the number **after** the number we are saying.



One more than 4 is 5.

'One less' is the number **before** the number we are saying.

One less than 4 is 3.

Comparing Objects and Numbers



We can compare objects using words like 'more' and 'fewer'.

There are **more** red triangles than green.

There are **fewer** green triangles than red.

YR2 PLACE VALUE KNOWLEDGE ORGANISER

Key Concepts

- Recognising the place value of each digit in a two digit number
- Read and write numbers up to 100 in numerals and in words
- Compare and order numbers from 0 up to 100
- Partitioning tens and ones
- Understanding place value charts
- Counting in 2s, 3s, 5s and 10s

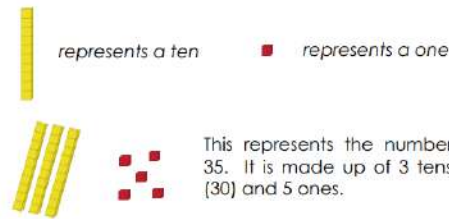
Key Vocabulary

- represents
- greater than/less than
- more than
- fewer
- most
- least
- equal to
- tens and ones
- place value

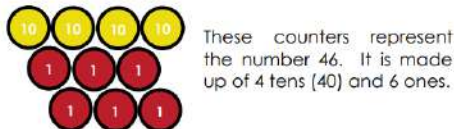


Numbers to 100

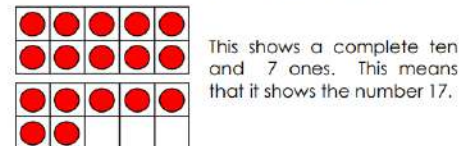
A two-digit number is made up of tens and ones.
Base 10 can be used to represent numbers.



Numbers can also be represented with place value counters.



Numbers can also be shown in a ten frame.



Place Value Charts

Place value helps us know the value of a digit, depending on its place in the number.

T	O

This place value chart shows a number using base 10. There are 4 tens (40) and 8 ones so it represents the number 48.

T	O

This place value chart shows a number using counters. There are 2 tens (20) and 4 ones. It represents the number 24.

T	O
2	5

In this place value chart, the 2 digit is in the tens place, so it really means 20. The 5 digit is in the ones place so it means 5.



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YR2 PLACE VALUE KNOWLEDGE ORGANISER

Counting in 2s, 5s and 10s.

2s - 2, 4, 6, 8, 10, 12, 14, 16, 18, 20



I have noticed that when I count in 2s, all the numbers are even.

5s - 5, 10, 15, 20, 25, 30, 35, 40, 45

I have noticed that when I count in 5s, all the numbers I say end with either a 5 or a 0.



10s - 10, 20, 30, 40, 50, 60, 70, 80



I have noticed that when I count in 10s, all the numbers end in a zero.

Counting in 3s

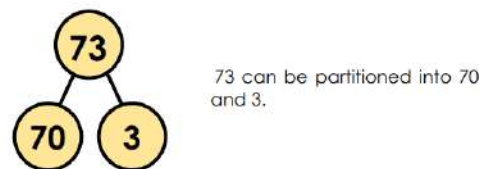
3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36

I have noticed that when I count in 3s, the numbers I say go odd, even, odd, even in a pattern.

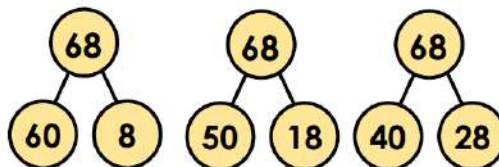


Partitioning Tens and Ones

Partitioning is where we split a number up into smaller parts. For example:



Numbers can be partitioned (broken apart) in more than one way.



Here are three different ways that the number 68 can be partitioned. The images show that...

$$60 + 8 = 68 \quad \text{and} \quad 50 + 18 = 68 \quad \text{and} \quad 40 + 28 = 68$$



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Ordering and Comparing Numbers

When we put numbers in order, we need to compare the value of their digits.



First, look at the tens digits in each number. They are the same so we then look at the ones digits. 4 is the smaller ones digit so 24 is the smaller number.

We can compare numbers and objects using the < and > symbols. < = less than > = greater than.



Read and Write Numbers in

Numerals and Words

Numbers can be written in both numerals and words. When writing a number in words, it is useful to think about the place value of the digits.

T	O
8	5

This would be written as eighty-five.

T	O
8	0

When there is a zero, we don't need to write anything for that column. This is just eighty, not eighty-zero.

YR3 PLACE VALUE KNOWLEDGE ORGANISER

Key Concepts

- Recognising the place value of each digit in a three digit number
- 100s, 10s and 1s
- Read and write numbers up to 1000 in numerals and in words
- Number line to 1000
- Finding 10 and 100 more or less
- Compare and order objects and numbers up to 1000
- Count in 50s

Key Vocabulary

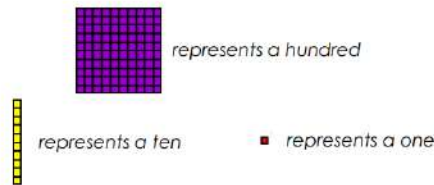
- compare
- greater than >
- less than <
- numeral
- place value
- ones, tens, hundreds
- digit
- count in fifties
- represent
- increase
- decrease



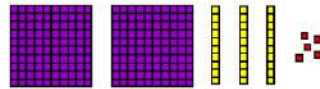
Numbers to 1000 - Base 10

A three-digit number is made up of hundreds, tens and ones.

Base 10 can be used to represent numbers:



This represents the number 235. It is made up of 2 hundreds, 3 tens and 5 ones.

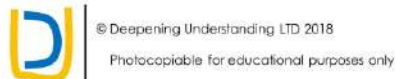


Numbers to 1000 - Place Value Counters

Numbers can also be represented with place value counters:



These counters are representing the number 312. It is made up of 3 hundreds, 1 ten and 2 ones.



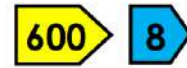
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Numbers to 1000 - Arrow Cards

Numbers can also be represented with place value arrow cards. These cards represent the number 638. It is made up of 6 hundreds, 3 tens and 8 ones.



In this second example, we only have a hundreds card and a ones card.



If we write 68, the 6 would not represent the 600 anymore. We need to have a place holder digit in the tens place and we use a zero for this. The number is written like this - 608.

Place Value of Digits

Place value helps us know the value of a digit, depending on its place in the number.

H	T	O
8	2	5

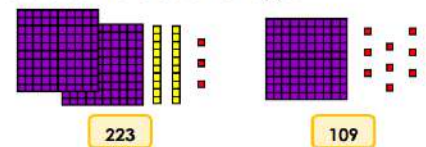
In the number above, the 8 digit is in the hundreds place so it really means 800.

The 2 digit is in the tens place so it really means 20.

The 5 digit is in the ones place so it means 5.

Ordering and Comparing Numbers

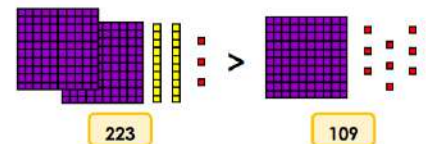
When we put numbers in order, we need to compare the value of their digits.



First, look at the hundreds digits in each number. 1 is the smaller hundred digit so 109 is the smaller number.

We can compare numbers and objects using the < and > symbols.

< = less than > = greater than.



Read and Write Numbers in Numerals and Words

Numbers can be written in both numerals and words. When writing a number in words, it is useful to think about the place value of the digits.

H	T	O
7	2	5

This would be written as seven hundred and twenty five.

H	T	O
4	0	3

When there is a zero, we don't need to write anything for that column. This is four hundred and three.

YR3 PLACE VALUE KNOWLEDGE ORGANISER

Number Line to 1000

Numbers can be placed on a number line. A number line can start and finish with any number e.g.



When estimating where to place 200 on this number line, you need to look at the numbers that are already labelled. I know that 200 is halfway between 100 and 300 therefore I need to label 200 halfway along the number line.



Counting in 50s

50, 100, 150, 200, 250, 300, 350



I have noticed there are 2 lots of 50 in a hundred.

I have noticed I can use my 5 times table to help me count in 50s.



10 and 100 More or Less

To find 10 more or less than a number, you first need to find the digit in the tens place.

H	T	O
6	3	9

Finding 10 more will increase the tens digit by 1. So, in this example, the 3 will become a 4. 10 more than 639 will be 649.

Finding 10 less will decrease the tens digit by 1. So in this example, the 3 will become a 2. 10 less than 639 is 629.



I've noticed that the hundreds and ones digits didn't change.

H	T	O
6	9	4

Finding 10 more when the number has a 9 in the tens place is slightly different. Adding 1 to the tens place would give 10, so to show that, the hundreds increases by 1 and a 0 is put in the tens place. 10 more than 694 is 704.

Finding 100 more or less is very similar to finding 10 more or less. Instead of changing the tens number, you change the hundreds numbers.



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YR4 PLACE VALUE KNOWLEDGE ORGANISER

Key Concepts

- Roman Numerals to 100
- Rounding to the nearest 10, 100 and 1000
- Counting in 25s and 1000s
- Recognising the place value of each digit in a four digit number
- Partitioning
- Comparing and ordering numbers
- 1000 more or less
- Negative numbers

Key Vocabulary

- increase/decrease
- rounding
- nearest
- negative number
- compare
- order
- digit
- sequence
- place value
- ones, tens, hundreds, thousands

Rounding

Rounding to the nearest 10

To round a number to the nearest 10, you should look at the ones digit. If the ones digit is 5 or more, round up. If the ones digit is 4 or less, round down.



In the number **427**, the ones digit is the **7**. **7** rounds up so **427** rounds up to **430**.

Rounding to the nearest 100

To round a number to the nearest 100, you should look at the tens digit. If the tens digit is 5 or more, round up. If the tens digit is 4 or less, round down.



In the number **328**, the tens digit is the **2**. **2** rounds down so **328** rounds down to **300**.

Rounding to the nearest 1000

To round a number to the nearest 1000, you should look at the hundreds digit. If the hundreds digit is 5 or more, round up. If the hundreds digit is 4 or less, round down.



In the number **1532**, the hundreds digit is the **5**. **5** rounds up so **1532** rounds up to **2000**.



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Place Value of Digits

Place value helps us know the value of a digit, depending on its place in the number.

TH	H	T	O
4	8	2	5

In the number above, the 4 digit is in the thousands place so it really means 4000.

The 8 digit is in the hundreds place so it really means 800.

The 2 digit is in the tens place so it really means 20.

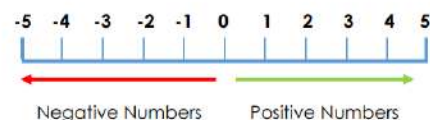
The 5 digit is in the ones place so it means 5.

Negative Numbers

If you count backwards from zero, you reach negative numbers.

Positive numbers are any numbers **more than** zero e.g. 1, 2, 3, 4, 5.

Negative numbers are any numbers **less than** zero e.g. -1, -2, -3, -4, -5.



YR4 PLACE VALUE KNOWLEDGE ORGANISER

Roman Numerals

I = 1	X = 10
II = 2	XX = 20
III = 3	XXX = 30
IV = 4	XL = 40
V = 5	L = 50
VI = 6	LX = 60
VII = 7	LXX = 70
VIII = 8	LXXX = 80
IX = 9	XC = 90
X = 10	C = 100

Counting in 25s and 1000s

Counting in 25s

25, 50, 75, 100, 125, 150, 175, 200



I notice a pattern when counting in 25s. There are 4 lots of 25 in a hundred.

Counting in 1000s

1000, 2000, 3000, 4000, 5000



I notice a pattern. I'm adding 1 to the thousands digit.

1000 More or 1000 Less

To find 1000 more or less than a number, you first need to find the digit in the thousands place.

TH	H	T	O
5	6	3	9

Finding 1000 more will increase the thousands digit by 1. So in this example, the 5 will become a 6. **1000 more than 5639 is 6639.**

Finding 1000 less will decrease the thousands digit by 1. So in this example, the 5 will become a 4. **1000 less than 5639 is 4639.**



I've noticed that the hundreds, tens and ones digits didn't change.

TTH	TH	H	T	O
0	9	6	3	9

Finding 1000 more when the number has a 9 in the thousands place is slightly different. Adding 1 to the thousands place would give 10, so to show that, the ten thousands increases by 1 and a 0 is put in the thousands place. **1000 more than 9639 is 10, 639.**



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Partitioning

Numbers can be partitioned (broken apart) in more than one way...

$$3271 = 3000 + 200 + 70 + 1$$

$$3271 = 2000 + 1200 + 60 + 11$$

$$3271 = 3000 + 100 + 170 + 1$$

Ordering and Comparing Numbers

When we put numbers in order, we need to compare the value of their digits.

3518 3736 2845

First, look at the thousands digits in each number. 2 is the smallest thousand digit so 2845 is the smallest number. The other two numbers both have a 3 in the thousands place so we then need to compare the hundreds digit. 5 is smaller than 7 therefore 3518 is smaller than 3736.

We can compare numbers using symbols:
< = less than and > = greater than

2845 < 3518 3736 > 3518

YR5 PLACE VALUE KNOWLEDGE ORGANISER

Key Concepts

- Roman Numerals to 1000
- Numbers to a million
- Rounding to the nearest 10, 100, 1000 and 10,000
- Recognising the place value of numbers up to 100,000
- Partitioning
- Compare and order numbers
- Negative numbers

Key Vocabulary

- increase/decrease
- less than/greater than
- equal to
- rounding
- nearest
- negative number
- compare
- order
- partitioning
- place value
- ones, tens, hundreds, thousands, ten thousands, hundred thousands



Place Value of Digits

Place value helps us know the value of a digit, depending on its place in the number.

HTH	TTH	TH	H	T	O
7	1	4	8	2	5

In the number above, the 7 digit is in the hundred thousands place so it really means 700,000.

The 1 digit is in the ten thousands place so it really means 10,000.

The 4 digit is in the thousands place so it really means 4,000.

The 8 digit is in the hundreds place so it really means 800.

The 2 digit is in the tens place so it really means 20.

The 5 digit is in the ones place so it means 5.

Partitioning

Numbers can be partitioned (broken apart) in more than one way. The number 714,825 could be partitioned in many ways such as:

$700,000 + 10,000 + 4,000 + 800 + 20 + 5$ or

$714,000 + 825$ or $700,000 + 14,000 + 700 + 125$ or

$600,000 + 140,000 + 600 + 220 + 5$



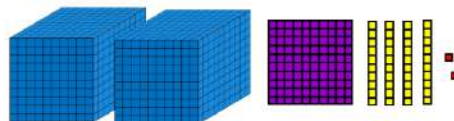
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Representing Numbers to 10,000

A four-digit number is made up of thousand, hundreds, tens and ones. Different concrete manipulatives and pictorial diagrams can be used to represent these numbers.

The number 2,132 can be represented like this:



This shows 2 thousands, 1 hundred, 4 tens and 2 ones.

The same number can also be represented with place value counters:



Roman Numerals

I = 1	XXX = 30	C = 100
II = 2	XL = 40	D = 500
III = 3	L = 50	M = 1000
IV = 4	LX = 60	
V = 5	LXX = 70	MMXVIII = 2018
X = 10	LXXX = 80	
XX = 20	XC = 90	

YR5 PLACE VALUE KNOWLEDGE ORGANISER

Negative Numbers

If you count backwards from zero, you reach negative numbers.

Positive numbers are any numbers **more than** zero e.g. 1, 2, 3, 4, 5.

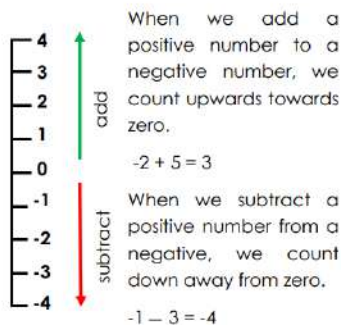
Negative numbers are any numbers **less than** zero e.g. -1, -2, -3, -4, -5.



Negative numbers Positive numbers

The number line shows that -5 is smaller than -1.

Negative numbers are often shown vertically such as on thermometers.



Rounding

When rounding, you first need to identify which digit will tell you whether to round up or down.

- To round a number to the **nearest 10**, you should look at the ones digit.
- To round a number to the **nearest 100**, you should look at the tens digit.
- To round a number to the **nearest 1000**, you should look at the hundreds digit.
- To round a number to the **nearest 10,000**, you should look at the thousands digit.
- To round a number to the **nearest 100,000**, you should look at the ten thousands digit.



I've noticed a pattern. You always need to look at the digit that is one place value lower than that which you are rounding to.

27,356 to the **nearest 10** is 27,360
27,356 to the **nearest 100** is 27,400



27,356 to the **nearest 1000** is 27,000
27,356 to the **nearest 10,000** is 30,000



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Ordering Numbers

When we put numbers in order, we need to compare the value of their digits.

123,518 123,736 122,845

First, look at the hundred thousands digits in each number. Each number has the same digit in the hundred thousand place so you then keep comparing digits of the same place value until you find ones that are different. The thousands digits are different so that tells us that 122,845 is the smallest number because it has a 2 in the thousands place. Looking at the hundreds digits, we can see that 123,518 is the next smallest.

122,845 123,518 123,736

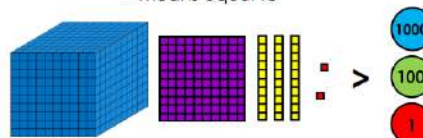
Smallest

Comparing Numbers

We can compare numbers using the < and > symbols.

< means less than > means greater than

= means equal to



$123,518 < 123,845$

$549,736 > 547,736$

YR6 PLACE VALUE KNOWLEDGE ORGANISER

Key Concepts

- Numbers to ten million
- Rounding any whole number to a required degree of accuracy
- Recognising the place value of numbers up to 10,000,000
- Compare and order numbers
- Negative numbers

Key Vocabulary

- increase/decrease
- less than/greater than
- equal to
- rounding
- nearest
- negative number
- compare
- order
- partitioning
- place value
- Part, part whole
- ones, tens, hundreds, thousands, ten thousands, hundred thousands, millions, ten million



Place Value of Digits

Place value helps us know the value of a digit, depending on its place in the number.

TM	M	HTH	TTH	TH	H	T	O
1	3	7	6	4	8	2	5

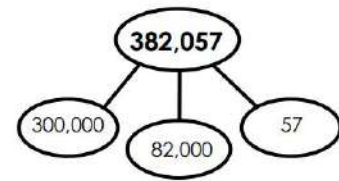
- In the number above, the 1 digit is in the ten millions place so it really means 10,000,000 (ten million).
- The 3 digit is in the millions place so it really means 3,000,000 (3 million).
- The 7 digit is in the hundred thousands place so it really means 700,000 (seven hundred thousand).
- The 6 digit is in the ten thousands place so it really means 60,000 (sixty thousand).
- The 4 digit is in the thousands place so it really means 4,000 (four thousand).
- The 8 digit is in the hundreds place so it really means 800 (eight hundred).
- The 2 digit is in the tens place so it really means 20 (twenty).
- The 5 digit is in the ones place so it means 5 (five).



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Representing Numbers

Numbers can be represented in a variety of ways:



4,812,300	
4,000,000	812,300

The above representations are often called part, part, whole diagrams. They can show different ways to partition a number.

M	HTH	TTH	TH	H	T	O
2	1	3	4	2	1	0

The counters on this place value chart show the number 2,130,421. This is written as two million, one hundred and thirty thousand, four hundred and twenty-one.

YR6 PLACE VALUE KNOWLEDGE ORGANISER

Negative Numbers

If you count backwards from zero, you reach negative numbers.

Positive numbers are any numbers **more than** zero e.g. 1, 2, 3, 4, 5.

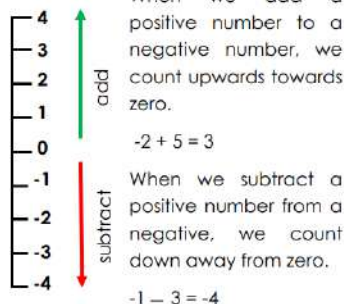
Negative numbers are any numbers **less than** zero e.g. -1, -2, -3, -4, -5.



Negative numbers Positive numbers

The number line shows that -5 is smaller than -1.

Negative numbers are often shown vertically such as on thermometers.



Rounding

When rounding, you first need to identify which digit will tell you whether to round up or down.

- To round a number to the **nearest 10**, you should look at the ones digit.
- To round a number to the **nearest 100**, you should look at the tens digit.
- To round a number to the **nearest 1000**, you should look at the hundreds digit.
- To round a number to the **nearest 10,000**, you should look at the thousands digit.
- To round a number to the **nearest 100,000**, you should look at the ten thousands digit.
- To round a number to the **nearest 1,000,000**, you should look at the hundred thousands digit.

527,356 to the **nearest 10** is 527,360
527,356 to the **nearest 100** is 527,400
527,356 to the **nearest 1000** is 527,000



527,356 to the **nearest 10,000** is 530,000
527,356 to the **nearest 100,000** is 500,000
527,356 to the **nearest 1,000,000** is 1,000,000



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Ordering Numbers

When we put numbers in order, we need to compare the value of their digits.

2,123,518 2,123,736 2,122,845

First, look at the millions digits in each number. Each number has the same digit in the millions place so you then keep comparing digits of the same place value until you find ones that are different. The thousands digits are different so that tells us that 2,122,845 is the smallest number because it has a 2 in the thousands place. Looking at the hundreds digits, we can see that 2,123,518 is the next smallest.

2,122,845 2,123,518 2,123,736

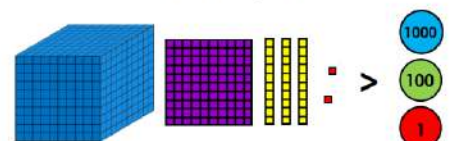
Smallest

Comparing Numbers

We can compare numbers using the < and > symbols.

< means less than > means greater than

= means equal to



1,122,845 < 123,518

2,579,736 > 2,579,436