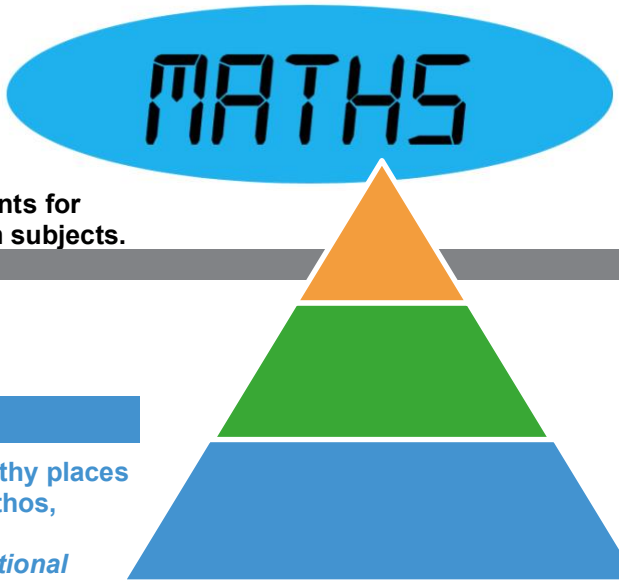
Scholes (Elmet) Primary
St James' CE Primary
Moortown Primary



Maths:
Our intent statement

Date: January 2022 and reviewed on an on-going basis
This Curriculum Statement sits alongside similar documents for Reading, Writing, Early Years and Science and foundation subjects.

Our curriculum intent

Our curriculum intent has three layers:

Layer 1: Our schools' core aim

We want Sphere Federation schools to be happy and healthy places to learn. This core aim permeates our schools and their ethos, whether in the classroom or around and about school.
(*At St James' CE Primary, this is expressed with one additional element: 'happy and healthy place to achieve and believe'.*)

Layer 2: Knowledge and skills

The knowledge and skills we are required to teach are set out in The National Curriculum (Department for Education, 2014). We set these out in a year-group based sequence of learning (NCETM curriculum prioritisation overviews). Challenge and fluency are key aspects: pupils who grasp concepts rapidly are challenged through being offered rich and sophisticated problems that extend and deepen their learning; and we want our children to be fluent in the recall of number facts (addition and subtraction, multiplication and division) and arithmetic whilst developing children's ability to reason and problem solve.

Layer 3: Attitudes

We deliver the content in ways which achieve four intentions ('ERIC') that promote positive attitudes to learning (many of which feature in the National Curriculum Purpose of Study):

Enjoyable

We want Sphere Federation schools to be happy and healthy places to learn. The more enjoyable Maths is, the more engaged our pupils will be, and the more we will be able to meet the needs of all children in our school community. We want our children to have a positive experience of Maths in a range of purposes and to reflect on their learning with confidence and pride.

Relevant

Maths is a really important part of everyday life: it helps us to make sense of our world; tackle real life problems; communicate information, develop skills which are essential in other areas of the curriculum; develop skills for life to achieve success in the work place and economic well-being.

Inspiring

Children find Maths inspiring because it can be challenging, but they know they can work towards an end-point and achieve satisfaction and a sense of success. Through providing a range of questions, tasks and activities, we ensure our children are inspired and motivated to work mathematically. We use a small steps approach so learning is successful and children feel successful.

Creative

Maths consists of all sorts of patterns and connections. Rather than seeing it as purely knowledge, rules and answers that are either right or wrong, we want children to be creative, too. By developing creativity in maths, we enable children to apply their knowledge in the real world. Children are given opportunities to work with open-ended problems. They're encouraged to discuss and share ideas and strategies, appreciating that there are often different solutions to the same problems.

Overview (key points)

Rationale

'Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.'
National curriculum in England: English programmes of study (Department for Education, 2013)

The following pages present an overview of how we implement our maths curriculum.

To meet our curriculum aims, teachers will deliver lessons which are:

- coherently planned, and
- sequenced to ensure cumulatively sufficient **knowledge** and **skills** for future learning

The aims of the National Curriculum are to develop fluency and the ability to reason mathematically and solve problems.

fluency	reasoning	problem-solving
• quick and efficient recall of facts • quick and efficient recall of procedures • flexibility to move between different contexts and representations of mathematics	• following a line of enquiry • conjecturing relationships and generalisations • developing an argument, justification or proof using mathematical language	• applying mathematics to a variety of routine and non-routine problems with increasing sophistication • breaking down problems into a series of simpler steps • persevering in seeking solutions.

Teaching and learning
The National Curriculum (2014) sets out expectations for each year group in Key Stage 1 and 2. We have created lists of Maths age-related expectations ('ARE Grids') which have taken the National Curriculum content and listed these in a format which teachers can use as an overview for the year and for their planning and assessments.

Teachers use the White Rose Maths Schemes of Learning as the basis of their planning whilst using their professional judgement to adapt these to meet the needs of their class. *However, following lockdowns due to Covid, we use NCETM Curriculum Prioritisation materials which incorporate the DfE's Ready to Progress Criteria (part of Mathematics guidance: key stages 1 and 2 - Non-statutory guidance for the national curriculum in England, Department for Education, 2020). As the name suggests, this helps us to prioritise content following the pandemic.*

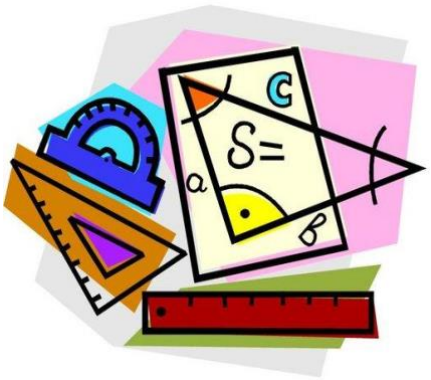
NCETM Curriculum Prioritisation
Teachers use the Curriculum Prioritisation resource as the basis of their planning whilst using their professional judgement to adapt these to meet the needs of their class. This is a term-by-term framework to support planning and teaching in 2021/22 and beyond – subject to review post-Covid. It provides a coherent sequencing of the primary maths curriculum. It draws together the DfE guidance on curriculum prioritisation (using ready-to-progress criteria) with high quality professional development and classroom resources provided by the National Centre for Excellence in the Teaching of Mathematics (NCETM). The materials include:

- **Years 1-6 Overviews**
  These map each year's curriculum into around 12 units.
- **Units of Learning**
  Each unit has a PowerPoint, with sequenced classroom slides, carrying comprehensive links to pages in the DfE Primary Mathematics Guidance, and to associated pedagogy and professional development in the NCETM Primary Mastery professional development materials.
- **Small Step Learning Outcomes**
  Each unit is broken down into smaller steps to provide a coherent journey through the learning. These small steps typically become daily maths lessons. However, teachers are encouraged to use their professional judgement to re-order, adapt, extend or shorten where necessary to meet the needs of the class.

Implementation: organisation and time

Key Stage 1

In KS1, there is a daily Maths lesson of between 45 and 60 minutes for all children. There is also a *Mastering Number* lesson of between 10 and 15 minutes four times a week.



Key Stage 2

In KS2, we have a daily Maths lesson of approximately 60 minutes for all children. In addition to the daily Maths lessons, teachers also provide short fluency sessions (5-10 minutes) each day to practise key calculating skills, counting, times tables (and corresponding division facts) or addition and subtraction facts.

The importance of mastery

A mastery approach is a set of principles and beliefs. Mastery is the belief that all pupils are capable of understanding and doing mathematics, given sufficient time. With good teaching, appropriate resources, effort and a 'can do' attitude, all children can achieve in and enjoy Maths.

Children's chances of success are maximised if they have a deep and lasting understanding of mathematical procedures and concepts. We use the phrase 'teaching for mastery' to describe elements of classroom practice that give pupils the best chances of mastering Maths. The essential idea behind mastery is that all children need a deep understanding of the mathematics they are learning so that future mathematical learning is built on solid foundations which do not need to be re-taught.

The importance of reasoning

The teaching of Maths focuses on fluency, reasoning and problem-solving.

Research by Nunes (Development of Maths Capabilities and Confidence in Primary School, 2009) identified the ability to reason mathematically as the most important factor in a pupil's success in Maths. Opportunities to develop mathematical reasoning skills are therefore integrated fully into the curriculum, enabling pupils to become more proficient at reasoning throughout all of their mathematics learning rather than just at the end of a particular unit or topic.

Vocabulary and mathematical language

The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof.

We support children to use precise mathematical vocabulary and to express their mathematical thinking in complete sentences. The 'I say, you say, you say, you say, we all say' technique enables us to provide a sentence-stem for children to communicate their ideas with mathematical precision and clarity. These sentence structures often express key conceptual ideas or generalities and provide a framework to embed conceptual knowledge and build understanding.

Cross-curricular links

Maths is mainly taught in discrete lessons. There are opportunities to use, apply and practise Maths learning in other subjects. In addition, some specific aspects of the Maths curriculum are taught in different subjects; for example, Roman numerals are taught in Latin lessons, and constructing and presenting data in Science and topic subjects, where data-handling is learnt in a relevant context, such as in Science or Geography.

Revisiting prior learning

Number fact fluency and, more broadly, arithmetic is revisited regularly as part of a spiral curriculum:

> ***'A spiral curriculum is one in which there is an iterative revisiting of topics, subjects or themes throughout the course. A spiral curriculum is not simply the repetition of a topic taught. It requires also the deepening of it, with each successive encounter building on the previous one.'***
> *'What is a spiral curriculum?', R M Harden, 2009*

Teachers provide regular opportunities for children to revisit prior learning; this learning could be from the previous lesson, week, term or year. Often, this will take the form of a short, focussed task at the beginning of a lesson. Occasionally, this may be a whole lesson or mini-series of lessons to address any identified gaps in knowledge or skills.

Special educational needs and/or disabilities (SEND)
Sphere Federation schools are inclusive and are committed to meeting the needs of children with SEND in **the most effective way** so that they achieve **the best possible outcomes**:

- we want pupils with SEND to acquire the knowledge and skills they need to reach their full potential,
- to be ready for the next stage in their education and,
- ultimately, to succeed in life.

To do this, we adapt how we implement the Maths curriculum to meet the needs of pupils with SEND so that we can develop their knowledge, skills and abilities to apply what they know and can do with increasing fluency and independence. The adaptations we make are appropriate and reasonable, and are made in accordance with the Equality Act 2010 and the SEND code of practice.

Challenge and deeper learning
Across all subjects, teachers provide opportunities for challenge and deeper learning. Sometimes, the challenge may not be evident in books; for example, challenge might be provided by less support during the teacher input; an additional, practical task that isn't recorded; and teacher questioning which is targeted to meet the needs of different pupils. Often, there is evidence in books of challenge for pupils: for example, teacher feedback which provides an additional task or thought-provoking question; an open-ended activity that promotes reasoning; and 'flipping over' the learning or activity by considering the opposite or reverse (eg by coming up with their own questions or criteria).

Impact: how we evaluate the impact of our Maths curriculum
We measure pupil achievement – the acquisition of knowledge and skills – and progress using a number of strategies, including:

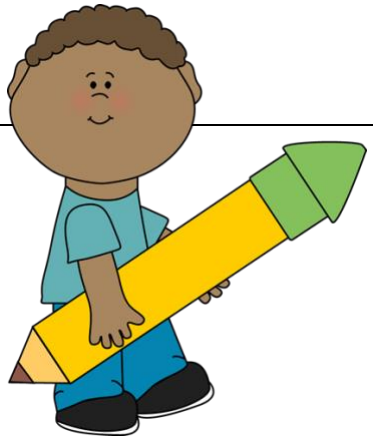
- on-going teacher assessments, based on questioning in class, observations and pupil outcomes (which includes their work in books).
- number facts and times tables screening checks. For children in Year 1 and 2, we assess children's rapid recall of addition and subtraction facts up to 20 (number bonds) each term. For children in Year 3 upwards, we assess children's rapid recall of tables facts each term. Results are communicated to parents and are acted on in school.
- in-year and end of year assessments (for Maths, these are a combination of teacher assessments and external tests, including Key Stage 1 and Key Stage 2 National Curriculum tests – 'SATs' and the Y4 multiplication tables check)

Scrutiny of progress in books and learning conversations with children are additional ways to assess impact. We explore how successful our children have been in acquiring knowledge and skills in relation to their stage of learning. In conversations with children, teachers and school leaders ask questions relating directly to age-related expectations and to times when they might have needed more support or when they experienced greater challenge. Lesson visits and the monitoring of planning support our assessment of impact. Whole school areas for development are identified as a result of evaluating the impact of what we do.

We also measure pupil attitudes using a number of strategies, including feedback during learning conversations and in pupil and parent/carer surveys; attitudes and behaviour in lessons across the curriculum; the quality of the work they produce, including taking pride in presentation. To support us in this, we refer back to Layer 3 of our curriculum intent: Attitudes. Children, particularly older children, will be encouraged to reflect on and self-assess their learning in terms of enjoyment, relevance, inspiration and creativity.

Age-related expectations: **Maths in Early Years Foundation Stage**

Nursery (expectations for the end of the year)	**Reception** (expectations for the end of the year)
Nursery and Reception learning experiences are taken from **Development Matters: Non-statutory curriculum guidance for the Early Years Foundation Stage**	
N1 Fast recognition of up to 3 objects, without having to count them individually ('subitising').	**R1** Fast recognition of up to 3 objects, without having to count them individually ('subitising').
N2 Recite numbers past 5.	**R2** Recite numbers past 5.
N3 Say one number for each item in order: 1,2,3,4,5.	**R3** Say one number for each item in order: 1,2,3,4,5.
N4 Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').	**R4** Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').
N5 Show 'finger numbers' up to 5.	**R5** Show 'finger numbers' up to 5.
N6 Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.	**R6** Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.
N7 Experiment with their own symbols and marks as well as numerals.	**R7** Experiment with their own symbols and marks as well as numerals.
N8 Solve real world mathematical problems with numbers up to 5.	**R8** Solve real world mathematical problems with numbers up to 5.
N9 Compare quantities using language: 'more than', 'fewer than'.	**R9** Compare quantities using language: 'more than', 'fewer than'.
N10 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'.	**R10** 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'.
N11 Understand position through words alone – for example, "The bag is under the table," – with no pointing.	**R11** Understand position through words alone – for example, "The bag is under the table," – with no pointing.
N12 Describe a familiar route.	**R12** Describe a familiar route.
N13 Discuss routes and locations, using words like 'in front of' and 'behind'.	**R13** Discuss routes and locations, using words like 'in front of' and 'behind'.
N14 Make comparisons between objects relating to size, length, weight and capacity.	**R14** Make comparisons between objects relating to size, length, weight and capacity.
N15 Select shapes appropriately: flat surfaces for building, a triangular prism for a roof etc.	**R15** Select shapes appropriately: flat surfaces for building, a triangular prism for a roof etc.
N16 Combine shapes to make new ones – an arch, a bigger triangle etc.	**R16** Combine shapes to make new ones – an arch, a bigger triangle etc.
N17 Talk about and identifies the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper.	**R17** Talk about and identifies the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper.
N18 Use informal language like 'pointy', 'spotty', 'blobs' etc.	**R18** Use informal language like 'pointy', 'spotty', 'blobs' etc.
N19 Extend and create ABAB patterns – stick, leaf, stick, leaf.	**R19** Extend and create ABAB patterns – stick, leaf, stick, leaf.
N20 Notice and correct an error in a repeating pattern.	**R20** Notice and correct an error in a repeating pattern.
N21 Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'	**R21** Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'



NCETM year group overviews: **Year 1**

Year 1

1

Previous Reception experiences and counting within 100

- 1NPV–1 Count within 100, forwards and backwards, starting with any number.
- 1.9 Composition of numbers: 20–100

2

Comparison of quantities and part–whole relationships

- 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 =.
- 1.1 Comparison of quantities and measures
- 1.2 Introducing 'whole' and 'parts': part–part–whole

3

Numbers 0 to 5

- 1NPV–2 Reason about the location of numbers to 20 within the linear number system, including comparing using < > and =.
- 1AS–1 Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers.
- 1.3 Composition of numbers: 0–5

4

Recognise, compose, decompose and manipulate 2D and 3D shapes

- 1G–1 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.
- 1G–2 Compose 2D and 3D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations.

5

Numbers 0 to 10

- 1NPV–2 Reason about the location of numbers to 20 within the linear number system, including comparing using < > and =.
- 1AS–1 Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers.
- 1.4 Composition of numbers: 6–10

6

Additive structures

- 1AS–2 Read, write and interpret equations containing addition (+), subtraction (-) and equals (=) symbols, and relate additive expressions and equations to real-life contexts.
- 1.5 Additive structures: introduction to aggregation and partitioning
- 1.6 Additive structures: introduction to augmentation and reduction

7

Addition and subtraction facts within 10

- 1NF–1 Develop fluency in addition and subtraction facts within 10.
- 1.7 Addition and subtraction: strategies within 10

8

Numbers 0 to 20

- 1NPV–2 Reason about the location of numbers to 20 within the linear number system, including comparing using < > and =.
- 1.10 Composition of numbers: 11–19

9

Unitising and coin recognition

- 1NF–2 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.
- 2.1 Counting, unitising and coins

10

Position and direction

- This topic is part of the National Curriculum but is not included in the DfE 2020 guidance or the NCETM Mastery PD Materials.

11

Time

- This topic is part of the National Curriculum but is not included in the DfE 2020 guidance or the NCETM Mastery PD Materials.

Number and place value
Number facts
Addition and subtraction
Multiplication and division
Fractions
Geometry
Other

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Both are available online

NCETM year group overviews: **Year 2**

Year 2

1	**Numbers 10 to 100** • 2NPV–1 Recognise the place value of each digit in two-digit numbers, and compose and decompose two-digit numbers using standard and non-standard partitioning. • 2NPV–2 Reason about the location of any two-digit number in the linear number system, including identifying the previous and next multiple of 10. • 1.8 Composition of numbers: multiples of 10 up to 100 • 1.9 Composition of numbers: 20–100
2	**Calculations within 20** • 2AS–1 Add and subtract across 10. • 2AS–2 Recognise the subtraction structure of 'difference' and answer questions of the form, "How many more…?". • 1.11 Addition and subtraction: bridging 10 • 1.12 Subtraction as difference
3	**Fluently add and subtract within 10** • 2NF–1 Secure fluency in addition and subtraction facts within 10, through continued practice. • 1.7 Addition and subtraction: strategies within 10
4	**Addition and subtraction of two-digit numbers (1)** • 2AS–3 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract only ones or only tens to/from a two-digit number. • 1.13 Addition and subtraction: two-digit and single-digit numbers • 1.14 Addition and subtraction: two-digit numbers and multiples of ten
5	**Introduction to multiplication** • 2MD–1 Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2, 5 and 10 multiplication tables. • 2.2 Structures: multiplication representing equal groups • 2.3 Times tables: groups of 2 and commutativity (part 1) • 2.4 Times tables: groups of 10 and of 5, and factors of 0 and 1 • 2.5 Commutativity (part 2), doubling and halving
6	**Introduction to division structures** • 2MD–2 Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotitive division). • 2.6 Structures: quotitive and partitive division
7	**Shape** • 2G–1 Use precise language to describe the properties of 2D and 3D shapes, and compare shapes by reasoning about similarities and differences in properties.
8	**Addition and subtraction of two-digit numbers (2)** • 2AS–4 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract any 2 two-digit numbers. • 1.15 Addition: two-digit and two-digit numbers • 1.16 Subtraction: two-digit and two-digit numbers
9	**Money** • This topic is part of the National Curriculum but is not included in the DfE 2020 guidance or the NCETM Mastery Professional Development Materials.
10	**Fractions** • 3.0 Guidance on the teaching of fractions in Key Stage 1
11	**Time** • This topic is part of the National Curriculum but is not included in the DfE 2020 guidance or the NCETM Mastery Professional Development Materials.
12	**Position and direction** • This topic is part of the National Curriculum but is not included in the DfE 2020 guidance or the NCETM Mastery Professional Development Materials.
13	**Multiplication and division – doubling, halving, quotitive and partitive division** • 2.5 Commutativity (part 2), doubling and halving • 2.6 Structures: quotitive and partitive division
14	**Sense of measure – capacity, volume, mass** • This topic is part of the National Curriculum but is not included in the DfE 2020 guidance or the NCETM Mastery Professional Development Materials.

Number and place value
Number facts
Addition and subtraction
Multiplication and division
Fractions
Geometry
Other

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NCETM year group overviews: **Year 3**

Year 3

1 Adding and subtracting across 10
- 2AS–1 Add and subtract across 10.
- 3NF–1 Secure fluency in addition and subtraction facts that bridge 10, through continued practice.
- 1.11 Addition and subtraction: bridging 10

2 Numbers to 1,000
- 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.
- 3AS–1 Calculate complements to 100.
- 3NF–3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10).
- 1.17 Composition and calculation: 100 and bridging 100
- 1.18 Composition and calculation: three-digit numbers

3 Right angles
- 3G–1 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.

4 Manipulating the additive relationship and securing mental calculation
- 3AS–3 Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction, and how both relate to the part–part–whole structure. Understand and use the commutative property of addition, and understand the related property for subtraction.
- 1.19 Securing mental strategies: calculation up to 999

5 Column addition
- 3AS–2 Add and subtract up to three-digit numbers using columnar methods.
- 1.20 Algorithms: column addition

6 2, 4, 8 times tables
- 3MD–1 Apply known multiplication and division facts to solve contextual problems with different structures, including quotitive and partitive division.
- 3NF–2 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.
- 3NF–3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10).
- 2.7 Times tables: 2, 4 and 8, and the relationship between them

7 Column subtraction
- 3AS–2 Add and subtract up to three-digit numbers using columnar methods.
- 1.21 Algorithms: column subtraction

8 Unit fractions
- 3F–1 Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts.
- 3F–2 Find unit fractions of quantities using known division facts (multiplication tables fluency).
- 3.1 Preparing for fractions: the part–whole relationship
- 3.2 Unit fractions: identifying, representing and comparing

9 Non-unit fractions
- 3F–1 Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts.
- 3F–3 Reason about the location of any fraction within 1 in the linear number system.
- 3F–4 Add and subtract fractions with the same denominator, within 1.
- 3.3 Non-unit fractions: identifying, representing and comparing
- 3.4 Adding and subtracting within one whole

10 Parallel and perpendicular sides in polygons
- 3G–2 Draw polygons by joining marked points, and identify parallel and perpendicular sides.

11 Time
- This topic is part of the National Curriculum but is not included in the DfE 2020 guidance or the NCETM Mastery PD Materials.

Number and place value
Number facts
Addition and subtraction
Multiplication and division
Fractions
Geometry
Other

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NCETM year group overviews: **Year 4**

Year 4

1 Review of column addition and subtraction

- 3AS–2 Add and subtract up to three-digit numbers using columnar methods.
- 1.20 Algorithms: column addition
- 1.21 Algorithms: column subtraction

2 Numbers to 10,000

- 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.
- 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.
- 4NF–3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 100).
- 1.22 Composition and calculation: 1,000 and four-digit numbers

3 Perimeter

- 4G–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.
- 2.16 Multiplicative contexts: area and perimeter 1

4 3, 6, 9 times tables

- 4NF–1 Recall multiplication and division facts up to 12×12, and recognise products in multiplication tables as multiples of the corresponding number.
- 2.8 Times tables: 3, 6 and 9, and the relationship between them

5 7 times table and patterns

- 4NF–1 Recall multiplication and division facts up to 12×12, and recognise products in multiplication tables as multiples of the corresponding number.
- 2.9 Times tables: 7 and patterns within/across times tables

6 Understanding and manipulating multiplicative relationships

- 4MD–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.
- 4MD–2 Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication.
- 4MD–3 Understand and apply the distributive property of multiplication.
- 4NF–3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 100)
- 2.10 Connecting multiplication and division, and the distributive law
- 2.13 Calculation: multiplying and dividing by 10 or 100

7 Coordinates

- 4G–1 Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant.

8 Review of fractions

- 3F–1 Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts.
- 3.1 Preparing for fractions: the part–whole relationship

9 Fractions greater than 1

- 4F–1 Reason about the location of mixed numbers in the linear number system.
- 4F–2 Convert mixed numbers to improper fractions and vice versa.
- 4F–3 Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers.
- 3.5 Working across one whole: improper fractions and mixed numbers

10 Symmetry in 2D shapes

- 4G–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.

11 Time

- This topic is part of the National Curriculum but is not included in the DfE 2020 guidance or the NCETM Mastery PD Materials.

12 Division with remainders

- 4NF–2 Solve division problems, with two-digit dividends and one-digit divisors, that involve remainders.
- 2.12 Division with remainders

Number and place value
Number facts
Addition and subtraction
Multiplication and division
Fractions
Geometry
Other

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Both are available online

NCETM year group overviews: **Year 5**

Year 5

1 Decimal fractions

- **5NPV–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.**
- **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.**
- **5NPV–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.**
- **5NPV–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.**
- **5NF–2 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth).**
- 1.23 Composition and calculation: tenths
- 1.24 Composition and calculation: hundredths and thousandths

2 Money

- 1.25 Addition and subtraction: money

3 Negative numbers

- 1.27 Negative numbers: counting, comparing and calculating

4 Short multiplication and short division

- **5MD–3 Multiply any whole number with up to 4 digits by any one-digit number using a formal written method.**
- **5MD–4 Divide a number with up to 4 digits by a one-digit number using a formal written method, and interpret remainders appropriately for the context.**
- 2.14 Multiplication: partitioning leading to short multiplication
- 2.15 Division: partitioning leading to short division

5 Area and scaling

- **5G–2 Compare areas and calculate the area of rectangles (including squares) using standard units.**
- 2.16 Multiplicative contexts: area and perimeter 1
- 2.17 Structures: using measures and comparison to understand scaling

6 Calculating with decimal fractions

- **5MD–1 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.**
- 2.19 Calculation: ×/÷ decimal fractions by whole numbers
- 2.29 Decimal place-value knowledge, multiplication and division

7 Factors, multiples and primes

- **5MD–2 Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.**
- 2.20 Multiplication with three factors and volume
- 2.21 Factors, multiples, prime numbers and composite numbers

8 Fractions

- **5NPV–5 Convert between units of measure, including using common decimals and fractions.**
- **5F–1 Find non-unit fractions of quantities.**
- **5F–2 Find equivalent fractions and understand that they have the same value and the same position in the linear number system.**
- **5F–3 Recall decimal fraction equivalents for 1/2, 1/4, 1/5 and 1/10, and for multiples of these proper fractions.**
- 3.6 Multiplying whole numbers and fractions
- 3.7 Finding equivalent fractions and simplifying fractions
- 3.10 Linking fractions, decimals and percentages

9 Converting units

- **5NPV–5 Convert between units of measure, including using common decimals and fractions.**

10 Angles

- **5G–1 Compare angles, estimate and measure angles in degrees (°) and draw angles of a given size.**

Number and place value
Number facts
Addition and subtraction
Multiplication and division
Fractions
Geometry
Other

Dark grey references are ready-to-progress criteria from the DfE Guidance 2020
Light grey references are from the NCETM Primary Mastery Professional Development materials
Both are available online

NCETM year group overviews: **Year 6**

Year 6

1 Calculating using knowledge of structures (1)
- 6AS/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).
- 6AS/MD–2 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.
- 1.28 Common structures and the part–part–whole relationship
- 1.29 Using equivalence and the compensation property to calculate

2 Multiples of 1,000
- 1.26 Composition and calculation: multiples of 1,000 up to 1,000,000

3 Numbers up to 10,000,000
- 6NPV–1 Understand the relationship between 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).
- 6NPV–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.
- 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.
- 1.30 Composition and calculation: numbers up to 10,000,000

4 Draw, compose and decompose shapes
- 6G–1 Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.

5 Multiplication and division
- 6AS/MD–2 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.
- 2.18 Using equivalence to calculate
- 2.23 Multiplication strategies for larger numbers and long multiplication
- 2.24 Division: dividing by two-digit divisors
- 2.25 Using compensation to calculate

6 Area, perimeter, position and direction
- 2.30 Multiplicative contexts: area and perimeter 2

7 Fractions and percentages
- 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.
- 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.
- 3.8 Common denomination: more adding and subtracting
- 3.9 Multiplying fractions and dividing fractions by a whole number
- 3.10 Linking fractions, decimals and percentages

8 Statistics
- This topic is part of the National Curriculum but is not included in the DfE 2020 guidance or the NCETM Mastery PD Materials.

9 Ratio and proportion
- 6AS/MD–3 Solve problems involving ratio relationships.
- 2.27 Scale factors, ratio and proportional reasoning

10 Calculating using knowledge of structures (2)
- 6AS/MD–2 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.
- 1.29 Using equivalence and the compensation property to calculate

11 Solving problems with two unknowns
- 6AS/MD–4 Solve problems with 2 unknowns.
- 1.31 Problems with two unknowns

12 Order of operations
- 2.22 Combining multiplication with addition and subtraction
- 2.28 Combining division with addition and subtraction

13 Mean average
- 2.26 Mean average and equal shares

Number and place value
Number facts
Addition and subtraction
Multiplication and division
Fractions
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