Billingshurst Primary School

Long Term Maths Plan

Year: 4

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7

AUTUMN 1

Addition and Subtraction

Review of column addition and subtraction (2 and 3 digit focus)

RtP:

- 3AS-2 Page 109

SPINES:

1.20 Algorithms: column addition

1.21 Algorithms: column subtraction

Small Steps:

1	Pupils identify the addends and the sum in column addition
2	Pupils use their knowledge of place value to correctly lay out column addition
3	Pupils add a pair of 2-digit numbers using column addition
4	Pupils add using column addition
5	Pupils use their knowledge of column addition to solve problems
6	Pupils add a pair of 2-digit numbers using column addition with regrouping in the ones column
7	Pupils add a pair of 2-digit numbers using column addition with regrouping in the tens column
8	Pupils add using column addition with regrouping
9	Pupils use known facts and strategies to accurately and efficiently calculate and check column addition
10	Pupils use their knowledge of column addition to solve problems
11	Pupils identify the minuend and the subtrahend in column subtraction
12	Pupils subtract using column subtraction
13	Pupils subtract from a 2-digit number using column subtraction with exchanging from tens to ones
14	Pupils subtract from a 3-digit number using column subtraction with exchanging from hundreds to tens (1)
15	Pupils subtract from a 3-digit number using a column subtraction with exchanging from hundreds to tens (2)
16	Pupils evaluate the efficiency of strategies for subtraction

17 Estimate and check the answer using the inverse operation (Y3)

18: Solve 2 step problems, deciding which operation to use and why

NC:

Review up to 3 digit in preparation for: Add up to 4-digits using the column method.

Review up to 3 digit in preparation for: Subtract up to 4-digits using the column method.

Place Value: Numbers to 10,000

RtP:

- 4NPV-1 Page 146
- 4NPV-2 Page 149
- 4NPV-3 Page 150
- 4NPV-4 Page 155
- 4NF-3 Page 166

Prior Learning RtP:

- 3NPV-1 Page 86
- 3NPV-2 Page 88
- 3NPV-3 Page 91
- 3NPV-4 Page 95
- 3NF-3 Page 103

SPINES:

1.22 Composition and calculation: 1,000 and four-digit numbers.

Small Steps:

1	Pupils explain how many tens, hundreds and ones 1,000 is composed of
2	Pupils use knowledge of 1,000 to explain common measure conversions
3	Pupils use knowledge of 1,000 to solve problems
4	Pupils use different strategies to add multiples of 100
5	Pupils use different strategies to subtract multiples of 100
6	Pupils use knowledge of calculation and common measure conversions to solve problems
7	Pupils compose and decompose four-digit numbers in different ways
8	Pupils use strategies to make solving calculations more efficient
9	Pupils compare and order four-digit numbers
10	Pupils calculate efficiently by using knowledge of place value, addition and subtraction
11	Pupils explain what rounding is
12	Pupils round a four-digit number to the nearest thousand
13	Pupils round a four-digit number to the nearest hundred and ten
14	Pupils round a four-digit number to the nearest thousand, hundred and ten
15	Pupils add up to 3 four-digit numbers using a column addition
16	Pupils subtract four-digit numbers using a column subtraction
17	Pupils use strategies to make solving calculations more efficient
18	Pupils explain how many '100s' and '200s', 1,000 is composed of
19	Pupils explain how many '500s' and '250s', 1,000 is composed of

NC:

Recognise thousands, hundreds, tens and units and order and compare numbers beyond 1000 .

Count in multiples of ~~6, 7, 9, 25 and~~ 1000 .

Find, show and estimate numbers using different representations, e.g. 15 could be 15 cm.

Find 1000 more or less than a number.

Mentally add or subtract numbers up to 2 digits.

Round any number to the nearest 10, 100 or 1000 .

AUTUMN 2

Perimeter

RtP:

- 4G-2 Page 197

SPINES:

2.16 Multiplicative contexts: area and perimeter 1

Small Steps:

1 A regular polygon has sides that are all the same length and interior angles that are all equal in size

2 Perimeter is the distance around the edge of a two-dimensional shape

3 Different shapes can have the same perimeter

4 Perimeter is measured in units of length and can be found by counting units

5 Perimeter can be calculated by adding together the side lengths of a 2D shape

6 The perimeter of a rectangle can be calculated by addition and multiplication

7 Unknown side lengths can be calculated from perimeter and known side lengths

8 The perimeter of a regular polygon can be calculated by multiplication

9 The side length of a regular polygon can be calculated by division where the perimeter is known

NC:

Describe and compare 2-D shapes, including quadrilaterals and triangles, based on their properties and sizes .

Y5: Distinguish between regular and irregular polygons based on reasoning about equal sides and angles .

Know the formula for measuring the perimeter of a square or rectangle in cm or m.

Multiplication

3, 6, 9 times tables

RtP:

- 4NF-1 Page 160

Prior Learning RtP:

- 3NF-2 Page 100

SPINES:

2.8 Times Tables: 3, 6 and 9, and the relationship between them

Small Steps:

1 Pupils represent counting in threes as the three times table

2 Pupils explain the relationship between adjacent multiples of three

3 Pupils use knowledge of the three times table to solve problems

4 Pupils represent counting in sixes as the six times table

5 Pupils explain the relationship between adjacent multiples of six

6 Pupils use knowledge of the six times table to solve problems

7 Pupils use known facts from the five times table to solve problems involving the six times table

8 Pupils explain the relationship between multiples of three and multiples of six

9 Pupils use knowledge of the relationships between the three and six times tables to solve problems

10 Pupils represent counting in nines as the nine times table

11 Pupils explain the relationship between adjacent multiples of nine (1)

12 Pupils explain the relationship between adjacent multiples of nine (2)

13 Pupils use known facts from the ten times table to solve problems involving the nine times table

14 Pupils explain the relationship between multiples of three and multiples of nine

15 Pupils explain the relationship between pairs of three and nine times table facts that have the same product (1)

16 Pupils explain the relationship between pairs of three and nine times table facts that have the same product (2)

17 Pupils use the divisibility rules for divisors of three

18 Pupils use the divisibility rules for divisors of six (1)

19 Pupils use the divisibility rules for divisors of six (2)

NC:

Count in multiples of 6, ~~7,~~ 9, ~~25 and 1000~~ .

Divide a 2-digit number by 2, 3, ~~4, 5~~, ~~6, 7 and 8~~ using an informal method.

Answer multiplication and division facts for multiplication tables up to 12x12 very quickly and know the commutative law .

Mentally add or subtract numbers up to 2 digits.

Multiplication

7 times table and patterns

RtP:

- 4NF-1 Page 160

Prior Learning RtP:

- 3NF-2 Page 100

SPINES:

2.9 Times Tables: 7 and patterns within / across times tables

Small Steps:

1 Pupils represent counting in sevens as the 7 times table

2 Pupils explain the relationship between adjacent multiples of seven

3 Pupils use their knowledge of the 7 times table to solve problems

4 Pupils identify patterns of odd and even numbers in the times tables

5 Pupils represent a square number

6 Pupils use knowledge of divisibility rules to solve problems

NC:

Count in multiples of ~~6~~, 7, ~~9, 25 and 1000~~ .

Divide a 2-digit number by ~~2, 3, 4, 5, 6~~, 7 ~~and 8~~ using an informal method.

Answer multiplication and division facts for multiplication tables up to 12x12 very quickly and know the commutative law .

Mentally add or subtract numbers up to 2 digits.

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SPRING 1

Understanding and manipulating multiplicative relationships

RtP:

- 4MD-1 Page 170
- 4MD-2 Page 173
- 4MD-3 Page 178
- 4NF-3 Page 166

Prior Learning RtP:

- 3NF-3 Page 103

SPINES:

2.10 Connecting multiplication and division, and the distributive law

2.13 Calculation: multiplying and dividing by 10 and 100

Small Steps:

1	Pupils explain what each factor represents in a multiplication equation
2	Pupils explain how each part of a multiplication and division equation relates to a story
3	Pupils explain where zero can be part of a multiplication or division expression and the impact it has
4	Pupils partition one of the factors in a multiplication equation in different ways using representations (I)
5	Pupils partition one of the factors in a multiplication equation in different ways using representations (II)
6	Pupils explain which is the most efficient factor to partition to solve a multiplication problem
7	Pupils use knowledge of distributive law to solve two part addition and subtraction problems, efficiently
8	Pupils use knowledge of distributive law to calculate products beyond known times tables facts
9	Pupils explain the relationship between multiplying a number by 10 and multiples of 10
10	Pupils explain why a zero can be placed after the final digit of a single-digit number when we multiply it by 10
11	Pupils explain why a zero can be placed after the final digit of a two-digit number when we multiply it by 10
12	Pupils explain why the final digit zero can be removed from a two-digit multiple of 10, when we divide by 10
13	Pupils explain why the final digit zero can be removed from a three-digit multiple of 10, when we divide by 10
14	Pupils explain the relationship between multiplying a number by 100 and multiples of 100
15	Pupils explain why two zeros can be placed after the final digit of a single-digit number when we multiply it by 100
16	Pupils explain why two zeros can be placed after the final digit of a two-digit number when we multiply it by 100
17	Pupils explain why the last two zeros can be removed from a three-digit multiple of 100 when we divide it by 100
18	Pupils explain why the last two zeros can be removed from a four-digit multiple of 100 when we divide it by 100
19	Pupils use knowledge of the composition of 100 to multiply by 100 in different ways
20	Pupils use knowledge of the composition of 100 to divide by 100 in different ways
21	Pupils explain how making a factor 10 times the size affects the product
22	Pupils explain how making the dividend 10 times the size affects the quotient
23	Pupils explain how making a factor 100 times the size affects the product
24	Pupils explain how making the dividend 100 times the size affects the quotient
25	Pupils scale known multiplication facts by 100
26	Pupils scale division derived from multiplication facts by 100

27. Solve two step problems in a context

NC:

Recognise and use factor pairs and commutivity in mental calculations.

Use place value, known and derived facts to multiply and divide mentally, including multiplying by 0 and 1; dividing by 1; multiplying three numbers together..

Recall multiplication and division facts for multiplication tables up to 12X12.

Solve problems using partitioning, e.g. 39 X 7 = 30 X 7 + 9 X 7 or using other number facts, e.g. 10 X 6 = 2 X 6 X 5.

Find the effect of dividing a one or two digit number by 10 or 100.

Solve two step problems in a context.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
SPRING 2	**Coordinates** RtP: • 4G-1 Page 192 Prior Learning RtP: • 3G-1 Page 134 (right angles) • 3G-2 Page 137 (parallel and perpendicular sides) Small Steps: 1 Pupils give directions from one position to another on a grid 2 Pupils move objects including polygons on a grid according to directions, and mark the new position 3 Pupils describe translations of polygons drawn on a square grid 4 Pupils draw polygons specified by translations 5 Pupils mark points specified as a translation from the origin 6 Pupils mark the position of points specified by coordinates in the first quadrant of a coordinate grid, and write coordinates for already-marked points 7 Pupils draw polygons specified by coordinates in the first quadrant 8 Pupils translate polygons in the first quadrant NC: Describe positions on a 2-D grid as co-ordinates in the first quadrant. Describe translations to the left / right and up / down. Plot specific points and draw sides to complete a polygon . Describe and compare 2-D shapes, including quadrilaterals and triangles, based on their properties and sizes .		**Review of fractions** RtP: • 3F-1 Page 120 SPINES: 3.1 Preparing for fractions: the part whole relationship Small Steps: 1 Pupils identify a whole and the parts that make it up 2 Pupils explain why a part can only be defined when in relation to a whole 3 Pupils identify the number of equal or unequal parts in a whole 4 Pupils identify equal parts when they do not look the same 5 Pupils explain the size of the part in relation to the whole 6 Pupils construct a whole when given a part and the number of parts NC: Preparing conceptually for NC objectives. Key themes: visualisation, ratio		**Fractions greater than 1** RtP: • 4F-1 Page 182 • 4F-2 Page 185 • 4F-3 Page 188 Prior Learning RtP: • 3F-3 Page 127 • 3F-4 Page 131 SPINES: 3.5 Working across one whole: improper fractions and mixed numbers Small Steps: Begin with brief review of identification of and generalisations around unit fractions and non-unit fractions. Ensure security of the language: numerator, denominator, unit fraction, non-unit fraction, equal, not equal https://www.ncetm.org.uk/classroom-resources/primm-302-unit-fractions-identifying-representing-and-comparing/ https://www.ncetm.org.uk/classroom-resources/primm-303-non-unit-fractions-identifying-representing-and-comparing/ 1 Pupils explain how to express quantities made up of both whole numbers and a fractional part 2 Pupils explain how a quantity made up of whole numbers and a fractional part is composed 3 Pupils compose and decompose quantities made of whole numbers and fractional parts 4 Pupils accurately label a range of number lines and explain the meaning of each part 5 Pupils identify numbers on marked but unlabelled number lines 6 Pupils estimate the position of numbers on a number line using fraction sense 7 Pupils compare and order mixed numbers using fraction sense 8 Pupils compare and order mixed numbers when the whole number is the same 9 Pupils compare and order mixed numbers when the whole number and the numerator of the fractional part is the same 10 Pupils make efficient choices about the order they solve an addition problem in 11 Pupils make efficient choices about the order they solve a subtraction problem in 12 Pupils express a quantity as a mixed number and an improper fraction (quarters) 13 Pupils convert a quantity from an improper fraction to a mixed number (quarters) 14 Pupils express and convert a quantity from an improper fraction to a mixed number (fifths) 15 Pupils explain how an improper fraction is converted into a mixed number (any unit) 16 Pupils explain how a mixed number is converted into an improper fraction 17 Pupils add mixed numbers 18 Pupils subtract a proper fraction from a mixed number (converting to an improper fraction first) 19 Pupils subtract a mixed number from a mixed number and explain which strategy is most efficient 20 Pupils use knowledge of subtraction to choose correct and efficient approaches when subtracting mixed numbers NC: Add and subtract fractions with the same denominator. Recognise mixed numbers and improper fractions and convert from one form to the other.	

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SUMMER 1	**Fractions greater than 1** continued (See previous column)			**Division with remainders** RtP: • 4NF-2 Page 163 SPINES: 2.12 Division with remainders Small Steps: 1 Pupils interpret a division story when there is a remainder and represent it with an equation (i) 2 Pupils interpret a division story when there is a remainder and represent it with an equation (ii) 3 Pupils interpret a division story when there is a remainder and represent it with an equation (iii) 4 Pupils explain how the remainder relates to the divisor in a division equation 5 Pupils explain when there will and will not be a remainder in a division equation 6 Pupils use knowledge of division equations and remainders to solve problems 7 Pupils interpret the answer to a division calculation to solve a problem (i) 8 Pupils interpret the answer to a division calculation to solve a problem (ii) NC: Recall multiplication and division facts for multiplication tables up to 12X12. Use place value, known and derived facts to multiply and divide mentally, including multiplying by 0 and 1; dividing by 1; ~~multiplying three numbers together.~~ Y5: ~~Divide numbers 4 digit numbers by 1 digit numbers using short division and~~ interpret remainders for the context.			
SUMMER 2	**Symmetry in 2D shapes** RtP: • 4G-3 Page 201 Small Steps: 1 Pupils complete a symmetrical pattern 2 Pupils compose symmetrical shapes from two congruent shapes 3 Pupils investigate lines of symmetry in 2D shapes by folding paper shape cut-outs 4 Pupils find lines of symmetry in 2D shapes using a mirror 5 Pupils reflect polygons in a line of symmetry 6 Pupils reflect polygons that are dissected by a line of symmetry NC: Identify lines of symmetry in 2-D shapes drawn in different orientations. Complete a simple symmetric figure by using a given line of symmetry. Describe and compare 2-D shapes, including quadrilaterals and triangles, based on their properties and sizes.			**Time** No specific NCETM Spine/RtP Resources for this Unit. NCETM guidance: https://www.ncetm.org.uk/classroom-resources/cp-year-4-unit-11-time/ Small Steps (Taken from White Rose): 1. Recap telling the time to 5 minutes 2. Recap Telling the time to the minute 3. Recap using a.m and p.m 4. 24-hour clock 5. Hours minutes and seconds 6. Years, months, weeks and days 7. Analogue to digital (12 hour) 8. Analogue to digital (24 hour) NC: Convert between units of measure (~~km to m and~~ hour to minute). 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.		**Consolidation** Use professional judgement and post-assessment data from end of blocks to establish a focus and fill gaps before Year 5.	

Cross Curricular opportunities:

NC: Read Roman numerals to 100: through daily dates and Romans history topic

NC: Read, write and convert time between analogue and digital 12- and 24-hour clocks.
Throughout the school day refer to when events occur, such as the start and end of the school day, lunchtime etc., increasing awareness from Year 3 by referring to how many minutes past the hour.
Focus on time intervals – for example, how many hours and minutes have passed since break time? Use both analogue and digital clocks.
Continue to support all pupils to know how many days there are in each month. Use opportunities such as writing the date, when you recognise birthdays in your class. Ask questions such as: “Jack’s birthday is on the 29th – which months could this be in? Which months could it not be in?”.

Statistics:
Present and interpret data using different scales on bar charts or time graphs.
Compare information and solve total and difference problems using information presented in bar charts, pictograms, tables and other graphs .