Billingshurst Primary School

Long Term Maths Plan

Year: 5

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
AUTUMN 1	**Place Value and Decimal Fractions** RtP: • 5NPV-1 Page 212 • 5NPV-2 Page 216 • 5NPV-3 Page 219 • 5NPV-4 Page 225 • 5NF-2 Page 236		Prior Learning RtP: • 4NPV-1 Page 146 • 4NPV-2 Page 149 • 4NPV-3 Page 150 • 4NPV-4 Page 155 • 4NF-3 Page 166			**Negative Numbers** SPINE: 1.27 Negative numbers: counting, comparing and calculating Small Steps: 1 Pupils represent a change story using addition and subtraction symbols 2 Pupils interpret numbers greater than and less than zero in different contexts	

Small Steps:
Review of 4 digit place value and Y4 consolidation
Read and write 5 and 6 digit numbers
Count forwards and backwards in steps of 1,000, 10,000 and 100,000
Compare and order 5 and 6 digit numbers
  Review of rounding to the nearest 10, 100 and 1000.
  Rounding to the nearest 10,000 and 100,000

1	Pupils identify tenths as part of a whole
2	Pupils describe and represent tenths as a decimal fraction
3	Pupils count in tenths in different ways
4	Pupils describe and write decimal numbers with tenths in different ways
5	Pupils compare and order decimal numbers with tenths
6	Pupils explain that decimal numbers with tenths can be composed additively
7	Pupils explain that decimal numbers with tenths can be composed multiplicatively
8	Pupils use their knowledge to calculate with decimal numbers within and across one whole
9	Pupils use their knowledge to calculate with decimal numbers using mental methods *Ensure strategies can also be applied to whole numbers
10	Pupils use their knowledge to calculate with decimal numbers using column addition and subtraction *Ensure strategies can also be applied to whole numbers
	Recap of rounding
11	Pupils use representations to round a decimal number with tenths to the nearest whole number
12	Pupils identify hundredths as part of a whole
13	Pupils describe and represent hundredths as a decimal fraction
14	Pupils describe and write decimals numbers with hundredths in different ways
15	Pupils compare and order decimal numbers with hundredths
16	Pupils explain that decimal numbers with hundredths can be partitioned in different ways
17	Pupils use their knowledge of decimal place value to convert between and compare metres and centimetres
18	Pupils explain that different lengths can be composed additively and multiplicatively
19	Pupils use their knowledge of decimal place value to solve problems in different contexts
20	Pupils use their knowledge to calculate with decimal numbers up to and bridging one tenth
21	Pupils use their knowledge to calculate with decimal numbers using column addition and subtraction
22	Pupils round a decimal number with hundredths to the nearest tenth
23	Pupils round a decimal number with hundredths to the nearest whole number
24	Pupils read and write numbers with up to 3 decimal places
25	Pupils compare and order numbers with up to 3 decimal places

NC:
Read, write order and compare numbers to 1,000,000 .
Y3: 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.
Y4: Count up and down in hundredths and make hundredths by dividing an object by a hundred and dividing tenths by ten.
Y4: Compare numbers with the same number of decimal places up to 2 decimal places
Read, write, order and compare numbers with up to three decimal places and solve problems with numbers up to 3 decimal places.
Recognise and use thousandths and relate them to tenths and hundredths.
Add and subtract numbers with more than 4-digits using the column method .
Mentally add and subtract large numbers (e.g. 12,462 − 2,300 = 10,162) .
Y4: Round decimals with one decimal place to the nearest whole number . Y5: Round decimals with two decimal places to the nearest whole number and to one decimal place.
Convert between different units of measure (km/m; m/cm; cm/mm; kg/g; l/ml) .
Solve number problems and practical problems that involve reading, writing, ordering and comparing numbers, counting forward and backwards, using negative numbers, rounding and roman numerals.

3 Pupils read and write negative numbers
4 Pupils explain how the value of a number relates to its position from zero
5 Pupils identify and place negative numbers on a number line
6 Pupils interpret sets of negative and positive numbers in a range of contexts
7 Pupils use their knowledge of positive and negative numbers to calculate intervals
8 Pupils explain how negative numbers are used on a coordinate grid
9 Pupils use their knowledge of positive and negative numbers to interpret graphs

NC:
Y4: Count backwards through zero and understand that -2 is greater than -3 .
Use negative numbers in a context and count forwards and backwards with positive and negative numbers through zero .
Y6: Add and subtract negative numbers and use them in a context .
Solve problems using information presented in line graphs.

AUTUMN 2

Money

Small Steps:

1 Pupils explain and represent whole pounds as a quantity of money
2 Pupils explain and represent whole pounds and pence as a quantity of money
3 Pupils explain how to compare amounts of money
4 Pupils convert quantities of money between pounds and pence
5 Pupils use their knowledge of addition to efficiently add commonly used prices
6 Pupils use their knowledge of subtraction to calculate the change due when paying whole pounds or notes
7 Pupils use and explain the most efficient strategies when adding quantities of money
8 Pupils use and explain the most efficient strategies when subtracting quantities of money
9 Pupils find the change when purchasing several items
10 Pupils use the most efficient and reliable strategy to find the change when purchasing several items

Ensure that the link between previous decimals work and rounding to check calculations is made.

NC:
Add and subtract numbers with more than 4-digits using the column method .
Sole multi-step problems in contexts, deciding which operations and methods to use and why (problems involving measure and decimals).
Use rounding to check answers to calculations.
Y4: Estimate, compare and calculate different measures, including money in pounds and pence.
Y4: Solve simple measure and money problems using fractions and decimals to 2 decimal places .

Short Multiplication and Short Division

Small Steps:

1 Pupils multiply a two-digit number by a single-digit number using partitioning and representations (no regroups)
2 Pupils multiply a two-digit number by a single-digit number using partitioning and representations (one regroup)
3 Pupils multiply a two-digit number by a single-digit number using partitioning and representations (two regroups)
4 Pupils multiply a two-digit number by a single-digit number using partitioning
5 Pupils multiply a two-digit number by a single-digit number using expanded multiplication (no regroups)
6 Pupils multiply a two-digit number by a single-digit number using short multiplication (no regroups)
7 Pupils multiply a two-digit number by a single-digit number using expanded multiplication (regrouping ones to tens)
8 Pupils multiply a two-digit number by a single-digit number using short multiplication (regrouping ones to tens)
9 Pupils multiply a two-digit number by a single-digit number using expanded multiplication (regrouping tens to hundreds)
10 Pupils multiply a two-digit number by a single-digit number using short multiplication (regrouping tens to hundreds)
11 Pupils multiply a two-digit number by a single-digit number using both expanded and short multiplication (two regroups)
12 Pupils use estimation to support accurate calculation
13 Pupils multiply a three-digit number by a single-digit number using partitioning and representations
14 Pupils multiply a three-digit number by a single-digit number using partitioning
15 Pupils multiply a three-digit number by a single-digit number using expanded and short multiplication (no regroups)
16 Pupils multiply a three-digit number by a single-digit number using expanded and short multiplication (one regroup)
17 Pupils multiply a three-digit number by a single-digit number using expanded and short multiplication (multiple regroups)
18 Pupils use estimation to support accurate calculation
19 Pupils divide a two-digit number by a single-digit number using partitioning and representations (no remainders, no exchanging)
20 Pupils divide a two-digit number by a single-digit number using partitioning and representations (with exchanging)
21 Pupils divide a two-digit number by a single-digit number using partitioning and representations (with exchanging and remainders)
22 Pupils divide a two-digit number by a single-digit number using short division (no exchanging, no remainders)
23 Pupils divide a two-digit number by a single-digit number using short division (with exchanging)
24 Pupils divide a two-digit number by a single-digit number using short division (with exchanging and remainders)
25 Pupils divide a three-digit number by a single-digit number using partitioning and representations (no exchanging, no remainders)
26 Pupils divide a three-digit number by a single-digit number using partitioning and representations (one exchange, no remainders)
27 Pupils divide a three-digit number by a single-digit number using partitioning and representations (with exchanging and remainders)
28 Pupils divide a three-digit number by a single-digit number using short division
29 Pupils divide a three-digit number by a single-digit number using short division (with exchanging and remainders)
30 Pupils solve short division problems accurately when the hundreds digit is smaller than the divisor
31 Pupils will use efficient strategies of division to solve problems
32 Solve problems involving all 4 operations and a combination of these.

NC:
Multiply and divide numbers mentally using known facts.
Y4: Multiply two-digit and three-digit numbers by a one-digit number using formal written layout.
Multiply 4 digit numbers by 1 or 2 digit numbers using short or long multiplication.
Divide numbers 4 digit numbers by 1 digit numbers using short division and interpret remainders for the context.
Solve problems involving all 4 operations and a combination of these.

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SPRING 1	**Area ad Scaling** RtP: • 5G-2 Page 269 Prior Learning RtP: • 4G-2 Page 197 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1017683/Maths_guidance_KS_1_and_2.pdf SPINES: 2.16 Multiplicative contexts: area and perimeter 1 2.17 Structures: using measures and comparison to understand scaling https://www.ncetm.org.uk/media/xega5ms1/ncetm_spine2_segment17_y4.pdf#page=15 Small Steps: Ensure children can distinguish between regular and irregular polygons based on reasoning about equal sides and angles (parallel and perpendicular line recap). 1 Pupils explain what area is and can measure using counting as a strategy (1) 2 Pupils explain what area is and can measure using counting as a strategy (2) 3 Pupils explain how to make different shapes with the same area 4 Pupils explain how to compare the area of different shapes 5 Pupils measure the area of flat shapes area using square centimetres 6 Pupils measure the area of flat shapes area using square metres 7 Pupils calculate the area of a rectangle using multiplication 8 Pupils calculate the area of rectilinear shapes 9 Pupils use their knowledge of area to solve problems 10 Pupils compare and describe lengths by using their knowledge of multiplication 11 Pupils use their knowledge of multiplication to solve comparison and change problems 12 Pupils compare and describe lengths by using their knowledge of division 13 Pupils use their knowledge of division to solve comparison and change problems 14 Pupils compare and describe measurements by using their knowledge of multiplication and division (mass/capacity/time) (1) 15 Pupils compare and describe measurements by using their knowledge of multiplication and division (mass/capacity/time) (2) 16 Pupils describe the changes in measurements using their knowledge of multiplication and division 17 Pupils use their knowledge of multiplication and division to solve comparison and change problems NC: Y4: Find the area of a rectangle or rectilinear shape by counting squares. Measure and calculate the perimeter of composite rectilinear shapes in cm and m . Calculate and compare the area of rectangles in cm² and m² . State and use the properties of a rectangle (including squares) to find missing lengths and angles. Solve problems including scaling by simple fractions and problems involving simple rates . Multiply and divide numbers mentally using known facts.					**Calculating with Decimal Fractions** RtP: • 5MD-1 Page 241 Prior Learning RtP: • 4MD-1 Page 170 SPINES: 2.29 Decimal place value knowledge, multiplication and division 2.19 Calculation: x/÷ decimal fractions by whole numbers Small Steps: 1 Pupils explain the effect of multiplying and dividing a number by 10, 100 and 1,000 (1) 2 Pupils explain the effect of multiplying and dividing a number by 10, 100 and 1,000 (2) 3 Pupils explain how to multiply and divide a number by 10, 100 and 1,000 (first 'number' two or more non-zero digits) 4 Pupils use their knowledge of multiplication and division by 10/100/1,000 to convert between units of measure (length) 5 Pupils use their knowledge of multiplication and division by 10/100/1,000 to convert between units of measure (mass and capacity) NC: Multiply and divide whole numbers and those involving decimals by 10, 100 or 1000.	

SPRING 2

Calculating with Decimal Fractions

RtP:
- 5MD-1 Page 241

Prior Learning RtP:
- 4MD-1 Page 170

SPINES:
2.29 Decimal place value knowledge, multiplication and division
2.19 Calculation: x/÷ decimal fractions by whole numbers

Small Steps:
6 Pupils explain how to use known multiplication facts and unitising to multiply decimal fractions by whole numbers (tenths)
7 Pupils explain how to use known multiplication facts and unitising to multiply decimal fractions by whole numbers (hundredths)
8 Pupils use their knowledge of multiplying decimal fractions by whole numbers to solve measures problems
9 Pupils explain the relationship between multiplying by 0.1 dividing by 10
10 Pupils explain the relationship between multiplying by 0.01 dividing by 100
11 Pupils explain how to use multiplying by 10 or 100 to multiply one-digit numbers by decimal fractions (1)
12 Pupils explain how to use multiplying by 10 or 100 to multiply one-digit numbers by decimal fractions (2)
13 Pupils explain how to use the size of the multiplier to predict the size of the product compared to the multiplicand
14 Pupils explain how to use multiplying by 10 or 100 to divide decimal fractions by one-digit numbers (1)
15 Pupils explain how to use multiplying by 10 or 100 to divide decimal fractions by one-digit numbers (2)

NC:
Multiply and divide whole numbers and those involving decimals by 10, 100 or 1000.
Y6: Multiply 1-digit numbers with up to 2 decimal places by whole numbers.
Convert between different units of measure (km/m; m/cm; cm/mm; kg/g; l/ml) .
Multiply and divide numbers mentally using known facts.

Factors, Multiples and Primes

RtP:
- 5MD-2 Page 245

Prior Learning RtP:
- 4MD-2 Page 173

SPINES:
2.20 Multiplication with three factors and volume
2.21 Factors, multiples, prime numbers and composite numbers

Small Steps:
1 Pupils explain what 'volume' is using a range of contexts
2 Pupils describe the units used to measure volume
3 Pupils explain how to calculate the volume of a cuboid
4 Pupils explain what a cube number is
5 Pupils use their knowledge of calculating volume to solve problems in a range of contexts
6 Pupils explain how to calculate the volume of compound shapes
7 Pupils explain the use of the commutative and distributive laws when multiplying three or more numbers
8 Pupils explain the reasons for changing two-factor multiplication calculations to three-factor multiplications
9 Pupils explain what a factor is and how to use arrays and multiplication/division facts to find them
10 Pupils explain how to systematically find all factors of a number and how they know when they have found them all
11 Pupils use a complete list of factors to explain when a number is a square number
12 Pupils explain how to identify a prime number or a composite number
13 Pupils explain how to identify a common factor or a prime factor of a number
14 Pupils explain how to identify a multiple or common multiple of a number
15 Pupils use knowledge of properties of number to solve problems in a range of contexts
16 Pupils explain how to use the factor pairs of '100' to solve calculations efficiently

NC:
Recognise and estimate volume using cubes and capacity using water.
Y6: Calculate the volume of cubes and cuboids using centimetre³ and cubic metres and extending to other units, such as mm³ and km³.
Recognise and use square numbers (²) and cube numbers (³) and the correct notation.
Identify multiples and be able to find all factor pairs .
Identify prime numbers, prime factors and composite (non-prime) numbers and investigate whether a number up to 100 is prime.
Solve X and ÷ problems using factors, multiples, squares and cubes, e.g. 4 X 35 = 2 X 2 X 35 .

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SUMMER 1

Fractions

RtP:
- 5NPV-5 Page 229
- 5F-1 Page 255
- 5F-2 Page 258
- 5F-3 Page 262

Prior Learning RtP:
- 3F-2 Page 124

SPINES:
3.6 Multiplying whole numbers and fractions
3.7 Finding equivalent fractions and simplifying fractions
3.10 Linking fractions, decimals and percentages (Teaching Point 1 – 3 ONLY)

Small Steps:
1. Pupils explain the relationship between repeated addition of a proper fraction and multiplication of fractions (unit fractions)
2. Pupils explain the relationship between repeated addition of a proper fraction and multiplication of fractions (non-unit fractions)
3. Pupils multiply a proper fraction by a whole number (within a whole)
4. Pupils multiply a proper fraction by a whole number (greater than a whole)
5. Pupils multiply an improper fraction by a whole number
6. Pupils multiply a mixed number by a whole number (product is within a whole)
7. Pupils multiply a mixed number by a whole number (product is greater than a whole)
8. Pupils find a unit fraction of a quantity
9. Pupils explain the relationship between finding a fraction of a quantity and multiplying a whole number by a unit fraction
10. Pupils explain the relationship between dividing by a whole number and multiplying a whole number by a unit fraction
11. Pupils use their knowledge of multiplying a whole number by a unit fraction to solve problems
12. Pupils find a non-unit fraction of a quantity (mental calculation)
13. Pupils find a non-unit fraction of a quantity (written calculation)
14. Pupils multiply a whole number by a proper fraction
15. Pupils explain when a calculation represents scaling down and when it represents repeated addition
16. Pupils find the whole when the size of a unit fraction is known
17. Pupils find a unit fraction when the size of a non-unit fraction is known
18. Pupils find the whole when the size of a non-unit fraction is known
19. Pupils find the unit fraction when the size of a non-unit fraction is known
20. Pupils use representations to describe and compare two fractions (1/4 and 3/12)
21. Pupils use representations to describe and compare two fractions (1/5 and 5/10)
22. Pupils use representations to describe and compare two fractions (pouring context)
23. Pupils correctly use the language of equivalent fractions
24. Pupils explain the vertical relationship between numerators and denominators within equivalent fractions (1/5, 1/3 and equivalent)
25. Pupils use their knowledge of the vertical relationship to solve equivalent fractions problems
26. Pupils explain the horizontal relationship between numerators and denominators across equivalent fractions (1/5, 1/3 and equivalent)
27. Pupils explain the relationship within families of equivalent fractions
28. Pupils use their knowledge of equivalent fractions to solve problems
29. Pupils explain and represent how to divide 1 into different amounts of equal parts
30. Pupils identify and describe patterns within the number system
31. Pupils use their knowledge of common equivalents to compare fractions with decimals
32. Pupils practise recalling common fraction-decimal equivalents

NC:
Multiply proper fractions and mixed numbers by whole numbers up to 10, supported by materials and diagrams.
Y4: 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. (Find fractions of amounts using unit and non-unit fractions e.g. 1/5 and 2/5.)
Add and subtract fractions with the same denominator and denominators that are multiples of the same number, e.g. 2/8 + 5/16.
Compare and order fractions whose denominators are all multiples of the same number .
Y4:Recognise and show families of equivalent fractions using diagrams Y5: Identify, name and write equivalent fractions and represent them visually, including tenths and hundredths.
Y4: Recognise and write decimal equivalents of any number of tenths or hundredths. Recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$.
Read and write decimal numbers as fractions e.g. 0.7 = $\frac{7}{10}$.
Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$, 1/10 and 1/25 .

SUMMER 2	**Converting Units** RtP: • 5NPV-5 Page 229 Small Steps: 1 Pupils apply memorised unit conversions to convert between units of measure (larger to smaller units - whole number conversions) 2 Pupils apply memorised unit conversions to convert between units of measure (smaller to larger units - whole number conversions) 3 Pupils convert from and to fraction and decimal fraction quantities of larger units 4 Pupils derive common conversions over 1 5 Pupils carry out conversions that correspond to 100 parts 6 Pupils solve measures problems involving different units 7 Pupils understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints 8 Pupils convert between miles and kilometres 9 Pupils solve problems involving converting between units of time Ensure problems are a combination of all 4 operations NC: Convert between different units of measure (km/m; m/cm; cm/mm; kg/g; l/ml) . Convert metric to common imperial units and imperial to metric. Y6: Convert between miles and kilometres. Solve problems involving converting between units of time Solve problems involving all 4 operations and a combination of these. Y6: Solve problems by converting measurements of length, mass, volume and time using decimal notation to three decimal places .	**Angles and Geometry** RtP: • 5G-1 Page 265 Small Steps: Ensure children can distinguish between regular and irregular polygons based on reasoning about equal sides and angles (parallel and perpendicular line recap). 1 Pupils compare the size of angles where there is a clear visual difference 2 Pupils use the terms acute, obtuse and reflex when describing the size of angles or amount of rotation with relation to right angles 3 Pupils use a unit called degrees (°) as a standard unit to measure angles 4 Pupils estimate the size of angles in degrees using angle sets 5 Pupils measure the size of angles accurately using a protractor Additional Learning outcomes for calculating missing angles (on a straight line, around a point, etc) as stated in Y6 objective. Supplement with Maths No Problem style content and White Rose resource NC: Know angles are measured in degrees; estimate and compare acute, obtuse and reflect angles. Y4: Identify acute and obtuse angles and compare and order angles up to two right angles by size. Draw given angles and measure them in degrees . Identify multiples of 90°; angles at a point on a straight line and ½ a turn (total 180°); angles at a point and one whole turn (total 360°); reflex angles and compare different angles. Distinguish between regular and irregular polygons based on reasoning about equal sides and angles . Recognise angles where they meet at a point, are on a straight line or are vertically opposite and find unknown angles, e.g. in a parallelogram, rhombus or trapezium by working out opposite angles. Solve problems involving all 4 operations and a combination of these.

Cross Curricular opportunities:

Read Roman numerals to 1000(M) and recognise years written in Roman numerals.
Complete, read and interpret information in tables, including timetables.
Solve problems using information presented in line graphs.