W

West Lodge Calculation Policy



Please note, teachers and pupils refer to both Ones (O) and Units (U) when teaching and learning about place value, however the following document references Ones (O)

| | Addition | | | |
|--------|---|--|--|--|
| ear 1 | Use of concrete and pictorial representations to add numbers Counting and combining sets of objects Read, write and understand mathematical statements involving + and = signs Represent and use number bonds within 20 Add 1-digit and 2-digit numbers to 20, including 0 Solve problems involving addition, using concrete and pictorial representations. Missing number problems in all possible places | | | |
| | Language: put together, add, altogether, total, distance between, difference between, more than | | | |
| Year 2 | Recall and use addition facts to 20 fluently Derive and use related facts up to 100 Add numbers using concrete objects, pictorial representations and mentally for: TO + O TO + T TO+TO O+O+O Use partitioning to support the addition above, e.g.: 35 + 24 30 + 20 5 + 4 50 + 9 | | | |
| | Understand and show addition of two numbers can be done in any order 13 + 4 = 17 | | | |

| | Empty number lines Bar modelling e.g. $25 + 33 = \Box$ e.g. $17 + \Box = 39$ 25 35 45 55 58 27 ? |
|--------|---|
| Year 3 | Mentally add (with the aid of empty number lines/partitioning if needed) HTO + O HTO + T HTO + H Count on by partitioning the second number only e.g. 247 + 125 = 247 + 100 + 20 + 5 = 347 + 20 + 5 = 367 + 5 = 372 Add up to 3-digit numbers by expanded method: example, 241 + 157 8 90 300 398 Use formal column addition to add numbers up to 3 digits, including exchanging: 428 + 356 784 1 Estimate the answer to a calculation and use inverse operations to check |
| Year 4 | Solve problems, including missing number problems, using complex addition. Continue to practice mental methods for addition with increasing to be a second or addition. |
| | Continue to practice mental methods for addition with increasingly large numbers to aid fluency (with the use of empty number lines/partitioning): Mentally add through use of empty number lines/partitioning, including crossing a boundary ThHTO + T ThHTO + H ThHTO + TO ThHTO + HTO |
| | e.g 1345 + 374 1345 + 300 = 1645 1645 + 70 = 1715 1715 + 4 = 1719 • Use formal column addition to add numbers up to 4 digits, including exchanging: 2647 + 1739 4386 1 1 |
| | Estimate and use inverse operations to check answers to a calculation |

| | Solve addition two-step problems in contexts, deciding which operations and methods to use and why. |
|--------|---|
| Year 5 | Add numbers mentally with increasingly large numbers Add whole numbers with more than 4 digits, including using formal column method (As Year 4 for the methods) Add decimal numbers mentally and using formal column method, including those with different numbers of decimal places |
| | Line up the decimal points decimal points 22.3 1.234 + 34.1 + 4.1 56.4 5.334 |
| | Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy Solve addition multi-step problems in contexts, deciding which operations and methods to use and why. |
| Year 6 | Perform mental calculations, including with mixed operations and large numbers Consolidate and secure formal written methods learnt prior, progressing to larger numbers Multiply single digit decimals Solve addition multi-step problems in contexts, deciding which operations and methods to use and why Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. Explore the order of operations using brackets; for example, 2 + 1 x 3 = and (2 + 1) x 3 = |

| Year 1 | Use of concrete and pictorial representations to subtract numbers Read, write and understand mathematical statements involving - and = signs Solve problems involving subtraction, using concrete and pictorial representations. Represent and use number bonds and related subtraction facts within 20 Subtract 1-digit and 2-digit numbers to 20, including zero Understand subtraction as take-away: Understand subtraction as finding the difference: Understand subtraction as finding the difference: Solve one-step problems that involve subtraction, using concrete objects and pictorial representations Missing number problems | | | |
|--------|---|--|--|--|
| | Understand subtraction as finding the difference: 1 | | | |
| | Solve one-step problems that involve subtraction, using concrete objects and pictorial representations Missing number problems | | | |
| | Solve one-step problems that involve subtraction, using concrete objects and pictorial representations Missing number problems | | | |
| | Solve one-step problems that involve subtraction, using concrete objects and pictoria representations | | | |
| | Use the following strategies/equipment to support subtraction: Multi-link cubes Dienes 100-square Number lines Bar modelling e.g 12 - 6 = □ e.g. 9 - 3 = □ | | | |
| | 0 1 2 3 4 5 6 7 8 9 10 11 12 | | | |
| | Language: subtract, minus, take away, distance between, difference between, and less than | | | |
| Year 2 | Recall and use subtraction facts to 20 fluently Derive and use related facts up to 100 Relate subtraction facts to addition facts 13 + 4 = 17 | | | |
| | TO - O TO - T TO - TO Use partitioning to support the subtraction above, e.g.: | | | |
| | 35 - 14 35 - 10 = 25 25 - 4 | | | |
| | Solve problems involving subtraction, using concrete and pictorial representations. Use the inverse operation (addition) to check calculations Solve missing number problems 56 - 9 = -30 = 25 | | | |

| | Use the following strategies/equipment to model take-away and difference: | | | |
|--------|---|--|--|--|
| | Multi-link cubes Dienes 100-square | | | |
| | Empty number lines Bar modelling | | | |
| | e.g 47 - 23 = □ e.g. 39 – 17 = □ | | | |
| | -3 -10 -10 39 | | | |
| | 24 27 37 47 7 | | | |
| ear 3 | Mentally subtract (with the aid of empty number lines/partitioning if needed) | | | |
| ear 5 | HTO - O | | | |
| | HTO - T | | | |
| | HTO - H | | | |
| | Subtract by partitioning the second number only e.g. | | | |
| | 247 - 125 247 - 100 = 147 | | | |
| | 147 – 20 = 127 | | | |
| | 127 - 5 = 122 | | | |
| | Subtract up to 3-digit numbers by expanded method (decomposition): | | | |
| | e.g 767 - 323 | | | |
| | 700 60 7 | | | |
| | <u>- 300 20 3</u> 400 40 4 444 | | | |
| | Use formal column subtraction to subtract numbers up to 3 digits, including | | | |
| | exchanging: | | | |
| | 4.1 | | | |
| | 546 | | | |
| | - 271 | | | |
| | 275 | | | |
| | | | | |
| | Estimate the answer to a calculation and use inverse operations to check | | | |
| | Solve problems, including missing number problems, using complex subtraction. | | | |
| Year 4 | Continue to practice mental methods for subtraction with increasingly large numbers | | | |
| | to aid fluency (with the use of empty number lines/partitioning): | | | |
| | Mentally subtract through use of empty number lines/partitioning, including crossing a | | | |
| | boundary ThHTO - T | | | |
| | ThHTO - H | | | |
| | ТҺНТО - ТО | | | |
| | ThHTO - HTO | | | |
| | 1762 487 | | | |
| | e.g. 1762 – 487 1762 – 400 = 1362 | | | |
| | 1362 - 80 = 1282 | | | |
| | 1282 – 7 = 1275 | | | |
| | Use formal column subtraction to subtract numbers up to 4 digits, including | | | |
| 1 | exchanging: | | | |
| | | | | |
| | | | | |
| | - 572 - 275 | | | |

| | Estimate and use inverse operations to check answers to a calculation Solve subtraction two-step problems in contexts, deciding which operations and methods to use and why. | | | | |
|--------|--|--|--|--|--|
| Year 5 | Subtract numbers mentally with increasingly large numbers subtract whole numbers with more than 4 digits, including using formal column method (As Year 4 for the methods) Subtract decimal numbers using formal column method, including those with different numbers of decimal places | | | | |
| | 1 ¹ 0 ¹ 5 21.6 ² 25 - 11.75 | | | | |
| | 9.875 | | | | |
| | Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy Solve subtraction multi-step problems in contexts, deciding which operations and methods to use and why. | | | | |
| ear 6 | Perform mental calculations, including with mixed operations and large numbers Consolidate and secure formal written methods learnt prior, progressing to larger numbers | | | | |
| | Continue subtraction of decimals, including those with different numbers of decimals places | | | | |
| | Solve subtraction multi-step problems in contexts, deciding which operations and methods to use and why | | | | |
| | Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. | | | | |
| | Explore the order of operations using brackets; for example, 7 - 1 x 3 = and (7 - 1) x 3 = | | | | |

| Multiplication | | | |
|----------------|---|--|--|
| Year 1 | Use of x and = sign Understand multiplication is related to doubling and repeated addition Use concrete objects, pictures and arrays e.g. 5 x 2 = 10 2 x 5 = 10 5 x 2 = 10 2 + 2 + 2 + 2 + 2 = 10 5 + 5 = 10 Count in twos, fives and tens Understand multiplication can be done in any order Solve one-step problems involving multiplication, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. | | |
| Year 2 | Expressing multiplication as a number sentence using x and = Recall and use multiplication facts for the 2, 5 and 10 multiplication tables Begin to use other multiplication tables and recall facts Show that multiplication of two numbers can be done in any order (commutative) 4 x 5 = 20 | | |
| Year 3 | Recall and use multiplication facts for the 3, 4 and 8 multiplication tables (Use doubling to connect the 2, 4 and 8 multiplication tables) Write and calculate mathematical statements for multiplication using the multiplication tables that they know Using mental strategies for two-digit numbers times one-digit numbers and progress to formal written methods Multiplying TO x O using partitioning 63 x 5 = (60 x 5) + (3 x 5) = 300 + 15 = 315 Multiplying TO x O using grid method e.g. 63 x 8 x 60 3 8 480 24 = 504 | | |

 Multiplying TO x O using formal column method e.g. 68 x 3

Solve problems, including missing number problems, involving multiplication

Year 4

- Recall multiplication facts for multiplication tables up to 12×12
- Use place value, known and derived facts, to multiply mentally, including multiplying by
 0 and 1 and multiplying together three numbers
- Use place value, known and derived facts, to multiply mentally by 10 and 100
 e.g. 6 x 4 = 24 60 x 4 = 240 600 x 4 = 2400
- Multiply HTO x O using partitioning

$$323 \times 3$$

= $(300 \times 3) + (20 \times 3) + (3 \times 3)$
= $900 + 60 + 9$
= 969

 Multiplying HTO x O using grid method 463 x 8

• Multiplying HTO x O using expanded method

Multiplying HTO x O using formal column method

 Solve two step problems in context, including missing number problems, involving multiplication

| ear 5 | Commit all multiplication tables to memory and use them confidently to make larger calculations Multiply numbers mentally drawing upon known facts Multiply by 10, 100 and 1000 including decimals Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers Know and use the vocabulary of prime numbers and primary factors Multiplying ThHTO by O using formal column method e.g. 479 x 5 Th H T O 4 7 9 |
|--------|---|
| | X 3 4 5 2 3 9 5 |
| | Multiplying HTO by TO using grid method e.g 264 x 38 |
| | x 200 60 4 30 6000 1800 120 7920 8 1600 480 32 +2112 10032 |
| | Multiplying up to ThHTO x TO using formal column long multiplication ThTh H T O |
| | Solve problems involving multiplication including using their knowledge of factors and multiples, squares and cubes |
| Year 6 | Perform mental calculations, including with mixed operations, with increasingly large numbers Continue to use all the multiplication tables to calculate mathematical statements in order to maintain fluency Identify common factors, common multiples and prime numbers Continue to use short and long multiplication for larger numbers |
| | Revise multiplying up to ThHTO x TO using formal column long multiplication (see Yea 5 for method) Solve multi-step problems involving multiplication in context, and use estimation to check answers to calculations |

| | Division |
|--------|---|
| Year 1 | Use of ÷ and = sign |
| | Use arrays as a pictorial representation for division: |
| | |
| | |
| | e.g. $15 \div 5 = 3$ There are 3 groups of 5 |
| | |
| | |
| | e.g. $15 \div 3 = 5$ There are 5 groups of 3 |
| | |
| | |
| | a lice concerts altitude in the second |
| | Use concrete objects, pictures and arrays to <u>share</u> small quantities: |
| | |
| | 13 seem |
| | |
| | |
| | Time (man) |
| | Use concrete objects, pictures and arrays to group small quantities: |
| | Put the suns into groups of 5. |
| | How many groups can you make? |
| | 00000 |
| | 0000 |
| | 00000 |
| | 0000 |
| | 20 ÷ 5 = |
| | Find ½ and ¼ of objects, numbers and quantities |
| | Solve one-step problems involving division, by calculating the answer using concrete |
| | objects, pictorial representations and arrays with the support of the teacher. |
| 'ear 2 | • Expressing division as a number sentence using ÷ and = |
| | Recall and use division facts for the 2, 5 and 10 multiplication tables Begin to use other multiplication tables and recall multiplication tables. |
| | Begin to use other multiplication tables and recall related division facts Understand how multiplication and division are inverse operations |
| | $4 \times 5 = 20$ $5 \times 4 = 20$ |
| | $20 \div 4 = 5$ $20 \div 5 = 4$ |

| | Use the inverse and practical resources to solve missing number problems Solve problems involving division, using materials, arrays, mental methods and division facts. | |
|--------|---|--|
| ear 3 | Recall and use division facts for the 3, 4 and 8 multiplication tables Write and calculate mathematical statements for division using the multiplication tables that they know Using mental strategies for TO ÷ O and progress to formal written methods Dividing TO ÷ O using partitioning e.g 69 ÷ 3 = (60 + 9) ÷ 3 | |
| | 3 7 12 Solve problems, including missing number problems, involving division | |
| Year 4 | Recall division facts for multiplication tables up to 12 × 12 Use place value, known and derived facts, to divide mentally, including dividing by 1 Use place value, known and derived facts, to divide mentally by 10 and 100 e.g. 24 ÷ 6 = 4 240 ÷ 6 = 40 2400 ÷ 6 = 400 Revise dividing TO ÷ O using partitioning (See Year 3 for method) Dividing HTO ÷ O using expanded written method (chunking) e.g. 486 ÷ 9 9 4 8 6 6 4 5 0 3 6 50 × 9 50 × 9 5 4 5 0 50 × 9 | |
| | Dividing HTO ÷ O using short written method (bus stop) with no remainders e.g. 276 ÷ 6 | |
| | H T O 4 6 6 2 7 6 | |
| | Solve two step problems in context, including missing number problems, involving division | |

| | | | _ |
|----|-----|-----|--------|
| V | 2 | 200 | |
| 16 | - 0 | | \Box |

- Commit all multiplication tables and the related division facts to memory, and use them confidently to make larger calculations
- Divide numbers mentally drawing upon known facts
- Divide by 10, 100 and 1000 including decimals
- Divide numbers up to ThHTO ÷ O using formal short division (bus stop), including with remainders as fractions, as decimals or by rounding

 Solve problems involving division including using their knowledge of factors and multiples, squares and cubes

Note that some children in Year 5 will also begin to look at the following Year 6 expectations:

Divide numbers up to ThHTO ÷ TO using formal long division

Divide numbers up to ThHTO ÷ TO using "chunking"

Year 6

- Perform mental calculations, including with mixed operations, with increasingly large numbers
- Continue to use all the multiplication tables and the related division facts to calculate mathematical statements in order to maintain fluency
- Divide numbers up to ThTHO ÷ TO using formal short division where appropriate, interpreting remainders according to context

Divide numbers up to ThHTO ÷ TO using formal long division

Divide numbers up to ThHTO ÷ TO using "chunking"

- Interpret remainders as whole number remainders, fractions, or by rounding
- Solve multi-step problems involving division in context, and use estimation to check answers to calculations

