Teaching programme: Reception

Counting and recognising numbers

2–8 Counting

2 • **Say and use the number names in order In familiar contexts** such as number rhymes, songs, stories, counting games and activities (first to five, then ten, then twenty and beyond).

2, 3 • Recite the number names in order, continuing the count forwards or backwards from a given number.

4, 5 • **Count reliably up to 10 everyday objects** (first to 5, then 10, then beyond), giving just one number name to each object. Recognise small numbers without counting.

5 • Begin to recognise 'none' and 'zero' in stories, rhymes and when counting.

6 • Count reliably in other contexts, such as clapping sounds or hopping movements.

7 • Count in tens.

7 • Count in twos.

8 • Estimate a number in the range that can be counted reliably, then check by counting.

9–10 Reading and writing numbers

9 • **Recognise numerals 1 to 9**, then 0 and 10, then beyond 10.

10 • Begin to record numbers, initially by making marks, progressing to simple tallying and writing numerals.

11–13 Comparing and ordering numbers

11, 12 • **Use language such as more or less, greater or smaller, to compare two numbers** and say which is more or less, and say a number which lies between two given numbers.

12 • Order a given set of numbers: for example, the set of numbers 1 to 6 given in random order.

12 • Order a given set of selected numbers: for example, the set 2, 5, 1, 8, 4.

13 • Begin to understand and use ordinal numbers in different contexts.

Adding and subtracting

14–17 Adding and subtracting

In practical activities and discussion:

14 • **Begin to use the vocabulary involved in adding and subtracting.**

14 • **Find one more or one less than a number from 1 to 10.**

14 • **Begin to relate addition to combining two groups of objects,** counting all the objects; extend to three groups of objects.

15 • Begin to relate addition to counting on.

15 • Begin to relate the addition of doubles to counting on.

15 • Find a total by counting on when one group of objects is hidden.

16 • Separate (partition) a given number of objects into two groups.

16 • Select two groups of objects to make a given total.

16 • **Begin to relate subtraction to 'taking away'** and counting how many are left.

17 • Remove a smaller number from a larger and find how many are left by counting back from the larger number.

17 • Begin to find out how many have been removed from a larger group of objects by counting up from a number.

17 • Work out by counting how many more are needed to make a larger number.

Solving problems

18–19 Reasoning about numbers or shapes

18 • **Talk about, recognise and recreate simple patterns**: for example, simple repeating or symmetrical patterns from different cultures.

18 • Solve simple problems or puzzles in a practical context, and respond to 'What could we try next?'

19 • Make simple estimates and predictions: for example, of the number of cubes that will fit in a box or strides across the room.

19 • Sort and match objects, pictures or children themselves, justifying the decisions made.

20–21 Problems involving 'real life' or money

20 • **Use developing mathematical ideas and methods to solve practical problems** involving counting and comparing in a real or role play context.

21 • Begin to understand and use the vocabulary related to money. Sort coins, including the £1 and £2 coins, and use them in role play to pay and give change.

Measures, shape and space

22–23 Comparing and ordering measures

22 • **Use language such as more or less, longer or shorter, heavier or lighter… to compare two quantities**, then more than two, by making direct comparisons of lengths or masses, and by filling and emptying containers.

23 • Begin to understand and use the vocabulary of time. Sequence familiar events. Begin to know the days of the week in order. Begin to read o'clock time.

24–27 Exploring pattern, shape and space

24, 25 • **Use language such as circle or bigger to describe the shape and size of solids and flat shapes**. Begin to name solids such as a cube, cone, sphere… and flat shapes such as a circle, triangle, square, rectangle… Use a variety of shapes to make models, pictures and patterns, and describe them.

26 • Put sets of objects in order of size.

26 • Talk about, recognise and recreate patterns: for example, simple repeating or symmetrical patterns in the environment (see also Reasoning).

27 • **Use everyday words to describe position**, direction and movement: for example, follow and give instructions about positions, directions and movements in PE and other activities.

NOTES • Key objectives are highlighted in **bold type**.
• Page references are to the supplement of examples for Reception.

Unit	Days	Pages	Topic	Objectives: children will be taught to...
1		2–8	Counting	
2		2–8	Counting	
3		24–27	Shape and space	
4		2–8 22–23	Counting Measures	
5		2–8 14–15	Counting Adding (one more)	
6			**Assess and review**	
7		2–8 11–13	Counting Comparing and ordering numbers	
8		2–8 14–15	Counting Adding and subtracting (one more, one less)	
9		24–27 18–19	Shape and space Reasoning	
10		2–8 22–23	Counting Measures, including time	
11		2–8 20–21	Counting Money and 'real life' problems	
12			**Assess and review**	

NOTE For Reception, the number of teaching days for each unit can be determined once children have settled into school.

Unit	Days	Pages	Topic	Objectives: children will be taught to...
1		2–8 11–13	Counting Comparing and ordering numbers	
2		2–8 14–17	Counting Adding and subtracting	
3		24–27 18–19	Shape and space Reasoning	
4		2–8 22–23	Counting Measures	
5		2–8 14–17 19–20	Counting Adding and subtracting Money and 'real life' problems	
6			**Assess and review**	
7		2–9 11–13	Counting and reading numbers Comparing and ordering numbers	
8		2–9 14–17	Counting and reading numbers Adding and subtracting	
9		24–27 18–19	Shape and space Reasoning	
10		2–9 22–23	Counting and reading numbers Measures, including time	
11		2–9 14–17 20–21	Counting and reading numbers Adding and subtracting Money and 'real life' problems	
12			**Assess and review**	

Unit	Days	Pages	Topic	Objectives: children will be taught to...
1		2–10 11–13	Counting, reading and writing numbers Comparing and ordering numbers	
2		2–10 14–17	Counting, reading and writing numbers Adding and subtracting	
3		24–27 18–19	Shape and space Reasoning	
4		2–10 22–23	Counting, reading and writing numbers Measures	
5		2–10 14–17 20–21	Counting, reading and writing numbers Adding and subtracting Money and 'real life' problems	
6			**Assess and review**	
7		2–10 11–13	Counting, reading and writing numbers Comparing and ordering numbers	
8		2–10 14–17	Counting, reading and writing numbers Adding and subtracting	
9		24–27 18–19	Shape and space Reasoning	
10		2–10 22–23	Counting, reading and writing numbers Measures, including time	
11		2–10 14–17 20–21	Counting, reading and writing numbers Adding and subtracting Money and 'real life' problems	
12			**Assess and review**	

Teaching programme: Year 1

Numbers and the number system

2–7 Counting, properties of numbers and number sequences

2 • Know the number names and recite them in order to at least 20, from and back to zero.

2 • **Count reliably at least 20 objects.**

2, 4, 6 • Describe and extend number sequences:
  count on and back in ones from any small number, and in tens from and back to zero;
  count on in twos from zero, then one, and begin to recognise odd or even numbers to about 20 as 'every other number';
  count in steps of 5 from zero to 20 or more, then back again;
  begin to count on in steps of 3 from zero.

8–15 Place value and ordering

8 • **Read and write numerals from 0 to at least 20.**

8 • Begin to know what each digit in a two-digit number represents. Partition a 'teens' number and begin to partition larger two-digit numbers into a multiple of 10 and ones (TU).

10 • **Understand and use the vocabulary of comparing and ordering numbers**, including ordinal numbers to at least 20. Use the = sign to represent equality.
  Compare two familiar numbers, say which is more or less, and give a number which lies between them.

12 • **Within the range 0 to 30, say the number that is 1 or 10 more or less than any given number.**

14 • **Order numbers to at least 20**, and position them on a number track.

16–19 Estimating

16 • Understand and use the vocabulary of estimation.
  Give a sensible estimate of a number of objects that can be checked by counting (e.g. up to about 30 objects).

Calculations

24–29 Understanding addition and subtraction

24, 28 • **Understand the operation of addition, and of subtraction (as 'take away', 'difference', and 'how many more to make'), and use the related vocabulary.**
  Begin to recognise that addition can be done in any order.
  Begin to use the +, – and = signs to record mental calculations in a number sentence, and to recognise the use of symbols such as □ or △ to stand for an unknown number.

26 • Begin to recognise that more than two numbers can be added together.

30–31 Rapid recall of addition and subtraction facts

30 • **Know by heart:**
  all pairs of numbers with a total of 10 (e.g. 3 + 7);
  addition facts for all pairs of numbers with a total up to at least 5, and the corresponding subtraction facts;
  addition doubles of all numbers to at least 5 (e.g. 4 + 4).
  Begin to know:
  addition facts for all pairs of numbers with a total up to at least 10, and the corresponding subtraction facts.

32–41 Mental calculation strategies (+ and –)

32 • Use knowledge that addition can be done in any order to do mental calculations more efficiently. For example:
  put the larger number first and count on in ones, including beyond 10 (e.g. 7 + 5);
  begin to partition into '5 and a bit' when adding 6, 7, 8 or 9, then recombine (e.g. 6 + 8 = 5 + 1 + 5 + 3 = 10 + 4 = 14).

32 • Identify near doubles, using doubles already known (e.g. 6 + 5).

34 • Add 9 to single-digit numbers by adding 10 then subtracting 1.

34 • Use patterns of similar calculations (e.g. 10 – 0 = 10, 10 – 1 = 9, 10 – 2 = 8…).

36, 38 • Use known number facts and place value to add or subtract a pair of numbers mentally within the range 0 to at least 10, then 0 to at least 20.

40 • Begin to bridge through 10, and later 20, when adding a single-digit number.

NOTES • Key objectives are highlighted in **bold type**.
  • Page references are to the supplement of examples for Years 1, 2 and 3.

Solving problems

60–61 Making decisions

60 • Choose and use appropriate number operations and mental strategies to solve problems.
(For examples, see pages 62–71.)

62–65 Reasoning about numbers or shapes

62 • Solve simple mathematical problems or puzzles; recognise and predict from simple patterns and relationships. Suggest extensions by asking 'What if…?' or 'What could I try next?'

64 • Investigate a general statement about familiar numbers or shapes by finding examples that satisfy it.

64 • Explain methods and reasoning orally.

66–71 Problems involving 'real life', money or measures

66, 68, 70 • **Use mental strategies to solve simple problems** set in 'real life', money or measurement contexts, **using counting, addition, subtraction, doubling and halving, explaining methods and reasoning orally.**

68 • Recognise coins of different values.
Find totals and change from up to 20p.
Work out how to pay an exact sum using smaller coins

90–93 Organising and using data

90, 92 • Solve a given problem by sorting, classifying and organising information in simple ways, such as:
using objects or pictures;
in a list or simple table.
Discuss and explain results.

Measures, shape and space

72–79 Measures

72 • Understand and use the vocabulary related to length, mass and capacity.
Compare two lengths, masses or capacities by direct comparison; extend to more than two.
Measure using uniform non-standard units (e.g. straws, wooden cubes, plastic weights, yogurt pots), or standard units (e.g. metre sticks, litre jugs).

74, 76 • **Suggest suitable standard or uniform non-standard units and measuring equipment to estimate, then measure, a length, mass or capacity**, recording estimates and measurements as 'about 3 beakers full' or 'about as heavy as 20 cubes'.

78 • Understand and use the vocabulary related to time.
Order familiar events in time.
Know the days of the week and the seasons of the year.
Read the time to the hour or half hour on analogue clocks.

80–89 Shape and space

80 • **Use everyday language to describe features of familiar 3-D and 2-D shapes**, including the cube, cuboid, sphere, cylinder, cone…, circle, triangle, square, rectangle…, referring to properties such as the shapes of flat faces, or the number of faces or corners… or the number and types of sides.

82 • Make and describe models, patterns and pictures using construction kits, everyday materials, Plasticine…
Fold shapes in half, then make them into symmetrical patterns.
Begin to relate solid shapes to pictures of them.

86, 88 • Use everyday language to describe position, direction and movement.

88 • Talk about things that turn.
Make whole turns and half turns.
Use one or more shapes to make, describe and continue repeating patterns…

Oral and mental: eg counting, mental strategies, rapid recall

Unit	Days	Pages	Topic	Objectives: children will be taught to...
1	3	2–7	Counting and properties of numbers	
2–4	15	8–15	Place value and ordering	
		24–29	Understanding + and –	
		32–41	Mental calculation strategies (+ and –)	
		66–69	Money and 'real life' problems	
		60–61	Making decisions	
5–6	8	70–77	Measures, including problems	
		80–83	Shape and space	
		62–65	Reasoning about shapes	
7	2		**Assess and review**	

Oral and mental: eg counting, mental strategies, rapid recall

Unit	Days	Pages	Topic	Objectives: children will be taught to...
8	5	2–7	Counting and properties of numbers	
		62–65	Reasoning about numbers	
9–11	15	8–17	Place value, ordering, estimating	
		24–29	Understanding + and –	
		32–41	Mental calculation strategies (+ and –)	
		66–69	Money and 'real life' problems	
		60–61	Making decisions	
12–13	10	70–79	Measures, and time, including problems	
		90–93	Handling data	
14	2		**Assess and review**	
Total	60			

Oral and mental: eg counting, mental strategies, rapid recall

Unit	Days	Pages	Topic	Objectives: children will be taught to...
1	3	2–7	Counting and properties of numbers	
2–4	15	8–15	Place value and ordering	
		24–29	Understanding + and –	
		32–41	Mental calculation strategies (+ and –)	
		66–69	Money and 'real life' problems	
		60–61	Making decisions	
5–6	8	70–77	Measures, including problems	
		80–89	Shape and space	
		62–65	Reasoning about shapes	
7	2		**Assess and review**	

Oral and mental: eg counting, mental strategies, rapid recall

Unit	Days	Pages	Topic	Objectives: children will be taught to...
8	5	2–7	Counting and properties of numbers	
		62–65	Reasoning about numbers	
9–10	10	8–17	Place value, ordering, estimating	
		24–29	Understanding + and –	
		32–41	Mental calculation strategies (+ and –)	
		66–69	Money and 'real life' problems	
		60–61	Making decisions	
11–12	10	70–79	Measures, and time, including problems	
		90–93	Handling data	
13	2		**Assess and review**	
Total	55			

Teaching programme: Year 2

Numbers and the number system

2–7 Counting, properties of numbers and number sequences
3 • Say the number names in order to at least 100, from and back to zero.
3 • Count reliably up to 100 objects by grouping them: for example, in tens, then in fives or twos.
3, 5, 7 • **Describe and extend simple number sequences: count on or back in ones or tens, starting from any two-digit number;**
count in hundreds from and back to zero;
count on in twos from and back to zero or any small number, and **recognise odd and even numbers** to at least 30;
count on in steps of 3, 4 or 5 to at least 30, from and back to zero, then from and back to any given small number.
7 • Begin to recognise two-digit multiples of 2, 5 or 10.

8–15 Place value and ordering
9 • **Read and write whole numbers to at least 100** in figures and words.
9 • **Know what each digit in a two-digit number represents, including 0 as a place holder**, and partition two-digit numbers into a multiple of ten and ones (TU).
11 • Use and begin to read the vocabulary of comparing and ordering numbers, including ordinal numbers to 100.
Use the = sign to represent equality.
Compare two given two-digit numbers, say which is more or less, and give a number which lies between them.
13 • Say the number that is 1 or 10 more or less than any given two-digit number.
15 • **Order whole numbers to at least 100**, and position them on a number line and 100 square.

16–19 Estimating and rounding
17 • Use and begin to read the vocabulary of estimation and approximation; give a sensible estimate of at least 50 objects.
19 • Round numbers less than 100 to the nearest 10.

20–23 Fractions
21, 23 • Begin to recognise and find one half and one quarter of shapes and small numbers of objects.
Begin to recognise that two halves or four quarters make one whole and that two quarters and one half are equivalent.

Calculations

24–29 Understanding addition and subtraction
25, 29 • Extend understanding of the operations of addition and subtraction.
Use and begin to read the related vocabulary.
Use the +, – and = signs to record mental additions and subtractions in a number sentence, and recognise the use of a symbol such as □ or △ to stand for an unknown number.
Recognise that addition can be done in any order, but not subtraction: for example, 3 + 21 = 21 + 3, but 21 – 3   3 – 21.
27 • Understand that more than two numbers can be added.
Begin to add three single-digit numbers mentally (totals up to about 20) or three two-digit numbers with the help of apparatus (totals up to 100).
25, 29 • **Understand that subtraction is the inverse of addition** (subtraction reverses addition).

30–31 Rapid recall of addition and subtraction facts
31 • **Know by heart:**
all addition and subtraction facts for each number to at least 10;
all pairs of numbers with a total of 20 (e.g. 13 + 7, 6 + 14);
all pairs of multiples of 10 with a total of 100 (e.g. 30 + 70).

32–41 Mental calculation strategies (+ and –)
33 • **Use knowledge that addition can be done in any order to do mental calculations more efficiently.** For example:
put the larger number first and count on in tens or ones;
add three small numbers by putting the largest number first and/or find a pair totalling 10;
partition into '5 and a bit' when adding 6, 7, 8 or 9, then recombine (e.g. 16 + 8 = 15 + 1 + 5 + 3 = 20 + 4 = 24);
partition additions into tens and units, then recombine.
33 • Find a small difference by counting up from the smaller to the larger number (e.g. 42 – 39).
33 • Identify near doubles, using doubles already known (e.g. 8 + 9, 40 + 41).
35 • Add/subtract 9 or 11: add/subtract 10 and adjust by 1.
Begin to add/subtract 19 or 21: add/subtract 20 and adjust by 1.
35 • Use patterns of similar calculations.
35 • **State the subtraction corresponding to a given addition, and vice versa.**
37, 39 • Use known number facts and place value to add/subtract mentally.
41 • Bridge through 10 or 20, then adjust.

46–51 Understanding multiplication and division
47, 49 • **Understand the operation of multiplication as repeated addition or as describing an array**, and begin to understand division as grouping (repeated subtraction) or sharing.
Use and begin to read the related vocabulary.
Use the ×, ÷ and = signs to record mental calculations in a number sentence, and recognise the use of a symbol such as □ or △ to stand for an unknown number.
47, 49 • **Know and use halving as the inverse of doubling.**

52–53 Rapid recall of multiplication and division facts
53 • **Know by heart:**
multiplication facts for the 2 and 10 times-tables;
doubles of all number to 10 and the corresponding halves.
Begin to know:
multiplication facts for the 5 times-table.
53 • Derive quickly:
division facts corresponding to the 2 and 10 times-tables;
doubles of all numbers to at least 15 (e.g. 11 + 11 or 11×2);
doubles of multiples of 5 to 50 (e.g. 20×2 or 35×2);
halves of multiples of 10 to 100 (e.g. half of 70).

54–57 Mental calculation strategies (× and ÷)
57 • Use known number facts and place value to carry out mentally simple multiplications and divisions.

58–59 Checking results of calculations
59 • Repeat addition in a different order.
59 • Check with an equivalent calculation.

NOTES • Key objectives are highlighted in **bold type**.
• Page references are to the supplement of examples for Years 1, 2 and 3.

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Solving problems

60–61 Making decisions

61 • **Choose and use appropriate operations and efficient calculation strategies** (e.g. mental, mental with jottings) **to solve problems.**
(For examples see pages 62–71.)

62–65 Reasoning about numbers or shapes

63 • Solve mathematical problems or puzzles, recognise simple patterns and relationships, generalise and predict. Suggest extensions by asking 'What if…?' or 'What could I try next?'

65 • Investigate a general statement about familiar numbers or shapes by finding examples that satisfy it.

65 • **Explain how a problem was solved** orally and, where appropriate, in writing.

66–71 Problems involving 'real life', money or measures

67, 69, 71 • Use mental addition and subtraction, simple multiplication and division, to solve simple word problems involving numbers in 'real life', money or measures, using one or two steps. Explain how the problem was solved.

69 • Recognise all coins and begin to use £.p notation for money (for example, know that £4.65 indicates £4 and 65p). Find totals, give change, and work out which coins to pay.

90–93 Organising and using data

91, 93 • Solve a given problem by sorting, classifying and organising information in simple ways, such as:
in a list or simple table;
in a pictogram;
in a block graph.
Discuss and explain results.

Measures, shape and space

72–79 Measures

73 • Use and begin to read the vocabulary related to length, mass and capacity.

73, 75 • **Estimate, measure and compare lengths, masses and capacities, using standard units** (m, cm, kg, litre)**; suggest suitable units and equipment for such measurements.**

77 • **Read a simple scale to the nearest labelled division, including using a ruler to draw and measure lines to the nearest centimetre,** recording estimates and measurements as '3 and a bit metres long' or 'about 8 centimetres' or 'nearly 3 kilograms heavy'.

79 • Use and begin to read the vocabulary related to time.
Use units of time and know the relationships between them (second, minute, hour, day, week).
Suggest suitable units to estimate or measure time.
Order the months of the year.
Read the time to the hour, half hour or quarter hour on an analogue clock and a 12-hour digital clock, and understand the notation 7:30.

80–89 Shape and space

81 • **Use the mathematical names for common 3-D and 2-D shapes**, including the pyramid, cylinder, pentagon, hexagon, octagon…
Sort shapes and describe some of their features, such as the number of sides and corners, symmetry (2-D shapes), or the shapes of faces and number of faces, edges and corners (3-D shapes).

83 • Make and describe shapes, pictures and patterns using, for example, solid shapes, templates, pinboard and elastic bands, squared paper, a programmable robot…
Relate solid shapes to pictures of them.

85 • Begin to recognise line symmetry.

87, 89 • **Use mathematical vocabulary to describe position, direction and movement**: for example, describe, place, tick, draw or visualise objects in given positions.

87, 89 • Recognise whole, half and quarter turns, to the left or right, clockwise or anti-clockwise.
Know that a right angle is a measure of a quarter turn, and recognise right angles in squares and rectangles.
Give instructions for moving along a route in straight lines and round right-angled corners: for example, to pass through a simple maze…

Oral and mental: eg counting, mental strategies, rapid recall

Unit	Days	Pages	Topic	Objectives: children will be taught to...
1	3	2–7	Counting and properties of numbers	
2–4	15	8–19	Place value, ordering, estimating, rounding	
		24–29	Understanding + and –	
		32–41	Mental calculation strategies (+ and –)	
		66–69	Money and 'real life' problems	
		58–61	Making decisions and checking results	
5–6	8	70–77	Measures, including problems	
		80–89	Shape and space	
		62–65	Reasoning about shapes	
7	2		**Assess and review**	

Oral and mental: eg counting, mental strategies, rapid recall

Unit	Days	Pages	Topic	Objectives: children will be taught to...
8	5	2–7	Counting and properties of numbers	
		62–65	Reasoning about numbers	
9	5	8–19	Place value, ordering, estimating, rounding	
		24–29	Understanding + and –	
		32–41	Mental calculation strategies (+ and –)	
		66–69	Money and 'real life' problems	
		58–61	Making decisions and checking results	
10–11	10	46–51	Understanding × and ÷	
		54–57	Mental calculation strategies (× and ÷)	
		66–69	Money and 'real life' problems	
		58–61	Making decisions and checking results	
		20–23	Fractions	
12–13	10	70–79	Measures, and time, including problems	
		90–93	Handling data	
14	2		**Assess and review**	
Total	60			

			Oral and mental: eg counting, mental strategies, rapid recall	

Unit	Days	Pages	Topic	Objectives: children will be taught to...
1	3	2–7	Counting and properties of numbers	
2–4	15	8–19	Place value, ordering, estimating, rounding	
		24–29	Understanding + and –	
		32–41	Mental calculation strategies (+ and –)	
		66–69	Money and 'real life' problems	
		58–61	Making decisions and checking results	
5–6	8	70–77	Measures, including problems	
		80–89	Shape and space	
		62–65	Reasoning about shapes	
7	2		**Assess and review**	

			Oral and mental: eg counting, mental strategies, rapid recall	

Unit	Days	Pages	Topic	Objectives: children will be taught to...
8	5	2–7	Counting and properties of numbers	
		62–65	Reasoning about numbers	
9	5	8–19	Place value, ordering, estimating, rounding	
		24–29	Understanding + and –	
		32–41	Mental calculation strategies (+ and –)	
		66–69	Money and 'real life' problems	
		58–61	Making decisions and checking results	
10	5	46–51	Understanding $\times$ and $\div$	
		54–57	Mental calculation strategies ($\times$ and $\div$)	
		66–69	Money and 'real life' problems	
		58–61	Making decisions and checking results	
		20–23	Fractions	
11–12	10	70–79	Measures, and time, including problems	
		90–93	Handling data	
13	2		**Assess and review**	
Total	55			

Teaching programme: Year 3

Numbers and the number system

3 • Count larger collections by grouping them: for example, in tens, then other numbers.
3, 5, 7 • Describe and extend number sequences:
count on or back in tens or hundreds, starting from any two- or three-digit number.
count on or back in twos starting from any two-digit number, and recognise odd and even numbers to at least 100;
count on in steps of 3, 4 or 5 from any small number to at least 50, then back again.
7 • Recognise two-digit and three-digit multiples of 2, 5 or 10, and three-digit multiples of 50 and 100.

9 • **Read and write whole numbers to at least 1000** in figures and words.
9 • **Know what each digit represents**, and partition three-digit numbers into a multiple of 100, a multiple of ten and ones (HTU).
11 • Read and begin to write the vocabulary of comparing and ordering numbers, including ordinal numbers to at least 100. Compare two given three-digit numbers, say which is more or less, and give a number which lies between them.
13 • Say the number that is 1, 10 or 100 more or less than any given two- or three-digit number.
15 • **Order whole numbers to at least 1000**, and position them on a number line.

17 • Read and begin to write the vocabulary of estimation and approximation.
Give a sensible estimate of up to about 100 objects.
19 • Round any two-digit number to the nearest 10 and any three-digit number to the nearest 100.

21, 23 • **Recognise unit fractions such as ½, ⅓, ¼, ⅕, ¹⁄₁₀… and use them to find fractions of shapes and numbers**.
Begin to recognise simple fractions that are several parts of a whole, such as ¾, ⅔ or ³⁄₁₀.
Begin to recognise simple equivalent fractions: for example, five tenths and one half, five fifths and one whole.
Compare familiar fractions: for example, know that on the number line one half lies between one quarter and three quarters.
Estimate a simple fraction.

Calculations

25, 29 • Extend understanding of the operations of addition and subtraction, read and begin to write the related vocabulary, and continue to recognise that addition can be done in any order. Use the +, – and = signs.
27 • Extend understanding that more than two numbers can be added; add three or four single-digit numbers mentally, or three or four two-digit numbers with the help of apparatus or pencil and paper.
25, 29 • Extend understanding that subtraction is the inverse of addition.

31 • **Know by heart:**
all addition and subtraction facts for each number to 20;
all pairs of multiples of 100 with a total of 1000 (e.g. 300 + 700).
Derive quickly:
all pairs of multiples of 5 with a total of 100 (e.g. 35 + 65).

33 • Use knowledge that addition can be done in any order to do mental calculations more efficiently. For example:
put the larger number first and count on;
add three or four small numbers by putting the largest number first and/or by finding pairs totalling 9, 10 or 11;
partition into '5 and a bit' when adding 6, 7, 8 or 9 (e.g. 47 + 8 = 45 + 2 + 5 + 3 = 50 + 5 = 55);
partition into tens and units, then recombine (e.g. 34 + 53 = 30 + 50 + 4 + 3).
33 • Find a small difference by counting up from the smaller to the larger number (e.g. 102 – 97).
33 • Identify near doubles, using doubles already known (e.g. 80 + 81).
35 • **Add and subtract mentally a 'near multiple of 10' to or from a two-digit number**… by adding or subtracting 10, 20, 30… and adjusting.
35 • Use patterns of similar calculations.
35 • Say or write a subtraction statement corresponding to a given addition statement, and vice versa.
37, 39 • Use known number facts and place value to add/subtract mentally.
41 • Bridge through a multiple of 10, then adjust.

43, 45 • Use informal pencil and paper methods to support, record or explain HTU ± TU, HTU ± HTU.
Begin to use column addition and subtraction for HTU ± TU where the calculation cannot easily be done mentally.

47 • Understand multiplication as repeated addition.
Read and begin to write the related vocabulary.
Extend understanding that multiplication can be done in any order.
49 • **Understand division** as grouping (repeated subtraction) or sharing. Read and begin to write the related vocabulary.
Recognise that division is the inverse of multiplication, and that halving is the inverse of doubling.
51 • Begin to find remainders after simple division.
51 • Round up or down after division, depending on the context.

53 • **Know by heart:**
multiplication facts for the 2, 5 and 10 times-tables.
Begin to know the 3 and 4 times-tables.
53 • Derive quickly:
division facts corresponding to the 2, 5 and 10 times-tables;
doubles of all whole numbers to at least 20 (e.g. 17 + 17 or 17 × 2);
doubles of multiples of 5 to 100 (e.g. 75 × 2, 90 × 2);
doubles of multiples of 50 to 500 (e.g. 450 × 2);
and all the corresponding halves (e.g. 36 ÷ 2, half of 130, 900 ÷ 2).

55 • To multiply by 10/100, shift the digits one/two places to the left.
55 • Use doubling or halving, starting from known facts (e.g. 8 × 4 is double 4 × 4).
55 • Say or write a division statement corresponding to a given multiplication statement.
57 • Use known number facts and place value to carry out mentally simple multiplications and divisions.

59 • Check subtraction with addition, halving with doubling and division with multiplication.
59 • Repeat addition or multiplication in a different order.
59 • Check with an equivalent calculation.

NOTES • Key objectives are highlighted in **bold type**.
• Page references are to the supplement of examples for Years 1, 2 and 3.

Solving problems

60–61 Making decisions
61 • **Choose and use appropriate operations (including multiplication and division) to solve word problems,** and appropriate ways of calculating: mental, mental with jottings, pencil and paper.
(For examples, see pages 62–71.)

62–65 Reasoning about numbers or shapes
63 • Solve mathematical problems or puzzles, recognise simple patterns and relationships, generalise and predict. Suggest extensions by asking 'What if…?'
65 • Investigate a general statement about familiar numbers or shapes by finding examples that satisfy it.
65 • **Explain methods and reasoning** orally and, where appropriate, in writing.

66–71 Problems involving 'real life', money and measures
67, 69, 71 • Solve word problems involving numbers in 'real life', money and measures, using one or more steps, including finding totals and giving change, and working out which coins to pay. Explain how the problem was solved.
69 • Recognise all coins and notes. **Understand and use £.p notation** (for example, know that £3.06 is £3 and 6p).

Handling data

90–93 Organising and using data
91, 93 • **Solve a given problem by organising and interpreting numerical data in simple lists, tables and graphs**,
for example:
simple frequency tables;
pictograms – symbol representing two units;
bar charts – intervals labelled in ones then twos;
Venn and Carroll diagrams (one criterion).

Measures, shape and space

72–79 Measures
73 • Read and begin to write the vocabulary related to length, mass and capacity.
Measure and compare using standard units (km, m, cm, kg, g, l, ml), including using a ruler to draw and measure lines to the nearest half centimetre (see page 77).
Know the relationships between kilometres and metres, metres and centimetres, kilograms and grams, litres and millilitres.
Begin to use decimal notation for metres and centimetres.
75 • Suggest suitable units and measuring equipment to estimate or measure length, mass or capacity.
77 • Read scales to the nearest division (labelled or unlabelled). Record estimates and measurements to the nearest whole or half unit (e.g. 'about 3.5 kg'), or in mixed units (e.g. '3 m and 20 cm').
79 • Read and begin to write the vocabulary related to time.
Use units of time and know the relationships between them (second, minute, hour, day, week, month, year). Suggest suitable units to estimate or measure time.
Use a calendar. Read the time to 5 minutes on an analogue clock and a 12-hour digital clock, and use the notation 9:40.

80–89 Shape and space
81 • Classify and describe 3-D and 2-D shapes, including the hemisphere, prism, semi-circle, quadrilateral…
referring to properties such as reflective symmetry (2-D), the number or shapes of faces, the number of sides/edges and vertices, whether sides/edges are the same length, whether or not angles are right angles…
83 • Make and describe shapes and patterns: for example, explore the different shapes that can be made from four cubes.
Relate solid shapes to pictures of them.
85 • **Identify** and sketch **lines of symmetry in simple shapes, and recognise shapes with no lines of symmetry.**
Sketch the reflection of a simple shape in a mirror line along one edge.
87 • Read and begin to write the vocabulary related to position, direction and movement: for example, describe and find the position of a square on a grid of squares with the rows and columns labelled.
Recognise and use the four compass directions N, S, E, W.
89 • Make and describe right-angled turns, including turns between the four compass points.
Identify right angles in 2-D shapes and the environment.
Recognise that a straight line is equivalent to two right angles.
Compare angles with a right angle.

			Oral and mental: eg counting, mental strategies, rapid recall	

Unit	Days	Pages	Topic	Objectives: children will be taught to...
1	3	8–19 76–77	Place value, ordering, estimating, rounding Reading numbers from scales	
2–3	10	24–29 32–41 66–69 58–61 42–45	Understanding + and – Mental calculation strategies (+ and –) Money and 'real life' problems Making decisions and checking results and in Term 3 Pencil and paper procedures	
4–6	13	70–77 80–89 62–65	Measures, including problems Shape and space Reasoning about shapes	
7	2		**Assess and review**	

Unit	Days	Pages	Topic	Objectives: children will be taught to...
8	5	2–7 62–65	Counting and properties of numbers Reasoning about numbers	
9–10	10	46–51 54–57 66–69 58–61	Understanding × and ÷ Mental calculation strategies (× and ÷) Money and 'real life' problems Making decisions and checking results	
11	5	20–23	Fractions	
12	5	24–29 32–41 42–45 71, 79 58–61	Understanding + and – Mental calculation strategies (+ and –) and in Term 3 Pencil and paper procedures Time, including problems Making decisions and checking results	
13	5	90–93	Handling data	
14	2		**Assess and review**	
Total	60			

Oral and mental: eg counting, mental strategies, rapid recall

Unit	Days	Pages	Topic	Objectives: children will be taught to...
1	3	8–19 76–77	Place value, ordering, estimating, rounding Reading numbers from scales	
2–3	10	24–29 32–41 66–69 58–61 42–45	Understanding + and – Mental calculation strategies (+ and –) Money and 'real life' problems Making decisions and checking results and in Term 3 Pencil and paper procedures	
4–6	13	80–89 62–65 70–79	Shape and space Reasoning about shapes Measures, and time, including problems	
7	2		**Assess and review**	

Oral and mental: eg counting, mental strategies, rapid recall

Unit	Days	Pages	Topic	Objectives: children will be taught to...
8	5	2–7 62–65	Counting and properties of numbers Reasoning about numbers	
9–10	10	24–29 32–41 46–51 54–57 66–69 58–61	Understanding + and – Mental calculation strategies (+ and –) Understanding × and ÷ Mental calculation strategies (× and ÷) Money and 'real life' problems Making decisions and checking results	
11	5	20–23	Fractions	
12	5	90–93	Handling data	
13	2		**Assess and review**	
Total	55			

Teaching programme: Year 4

Numbers and the number system

2–15 Place value, ordering and rounding (whole numbers)
2 • Read and write whole numbers to at least 10 000 in figures and words, and know what each digit represents.
Partition numbers into thousands, hundreds, tens and ones.

4 • Add/subtract 1, 10, 100 or 1000 to/from any integer, and count on or back in tens, hundreds or thousands from any whole number up to 10 000.

6 • Multiply or divide any integer up to 1000 by 10 (whole-number answers), and understand the effect.
Begin to multiply by 100.

8 • Read and write the vocabulary of comparing and ordering numbers. **Use symbols correctly, including less than (<), greater than (>), equals (=).**
Give one or more numbers lying between two given numbers and order a set of whole numbers less than 10 000.

10, 12 • Read and write the vocabulary of estimation and approximation. Make and justify estimates up to about 250, and estimate a proportion. **Round any positive integer less than 1000 to the nearest 10 or 100.**

14 • Recognise negative numbers in context (e.g. on a number line, on a temperature scale).

16–21 Properties of numbers and number sequences
16 • Recognise and extend number sequences formed by counting from any number in steps of constant size, extending beyond zero when counting back: for example, count on in steps of 25 to 500, and then back to, say, –100.

18 • Recognise odd and even numbers up to 1000, and some of their properties, including the outcome of sums or differences of pairs of odd/even numbers.

18 • Recognise multiples of 2, 3, 4, 5 and 10, up to the tenth multiple.

22–31 Fractions and decimals
22 • Use fraction notation. **Recognise simple fractions that are several parts of a whole,** such as $\frac{2}{3}$ or $\frac{5}{8}$, **and mixed numbers,** such as $5\frac{3}{4}$; **recognise the equivalence of simple fractions** (e.g. fractions equivalent to $\frac{1}{2}$, $\frac{1}{4}$ or $\frac{3}{4}$).
Identify two simple fractions with a total of 1 (e.g. $\frac{3}{10}$ and $\frac{7}{10}$).

22 • Order simple fractions: for example, decide whether fractions such as $\frac{3}{8}$ or $\frac{7}{10}$ are greater or less than one half.

24 • Begin to relate fractions to division and find simple fractions such as $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{10}$… of numbers or quantities.
Find fractions such as $\frac{2}{3}$, $\frac{3}{4}$, $\frac{3}{5}$, $\frac{7}{10}$ … of shapes.

26 • Begin to use ideas of simple proportion: for example, 'one for every…' and 'one in every…'

28 • Understand decimal notation and place value for tenths and hundredths, and use it in context. For example:
order amounts of money;
convert a sum of money such as £13.25 to pence, or a length such as 125 cm to metres;
round a sum of money to the nearest pound.

30 • Recognise the equivalence between the decimal and fraction forms of one half and one quarter, and tenths such as 0.3.

Calculations

34–37 Understanding addition and subtraction
34, 36 • Consolidate understanding of relationship between + and –.
Understand the principles (not the names) of the commutative and associative laws as they apply or not to addition and subtraction.

38–39 Rapid recall of addition and subtraction facts
38 • Consolidate knowing by heart:
addition and subtraction facts for all numbers to 20.
Derive quickly:
all number pairs that total 100 (e.g. 62 + 38, 75 + 25, 40 + 60);
all pairs of multiples of 50 with a total of 1000 (e.g. 850 + 150).

40–47 Mental calculation strategies (+ and –)
40 • Find a small difference by counting up (e.g. 5003 – 4996).
40 • Count on or back in repeated steps of 1, 10 or 100.
40 • Partition into tens and units, adding the tens first.
40 • Identify near doubles, using known doubles (e.g. 150 + 160).
40 • Add or subtract the nearest multiple of 10, then adjust.
42 • Continue to use the relationship between addition and subtraction.
42 • Add 3 or 4 small numbers, finding pairs totalling 10, or 9 or 11.
Add three two-digit multiples of 10, such as 40 + 70 + 50.
44, 46 • **Use known number facts and place value to add or subtract mentally, including any pair of two-digit whole numbers.**

48–51 Pencil and paper procedures (+ and –)
48, 50 • Use informal pencil and paper methods to support, record or explain additions/subtractions.
**Develop and refine written methods for:
column addition and subtraction of two whole numbers less than 1000, and addition of more than two such numbers;**
money calculations (for example, £7.85 ± £3.49).

52–57 Understanding multiplication and division
52, 54 • Extend understanding of the operations of × and ÷, and their relationship to each other and to + and –.
Understand the principles (not the names) of the commutative, associative and distributive laws as they apply to multiplication.
56 • **Find remainders after division.**
Divide a whole number of pounds by 2, 4, 5 or 10 to give £.p.
Round up or down after division, depending on the context.

58–59 Rapid recall of multiplication and division facts
58 • **Know by heart:
multiplication facts for 2, 3, 4, 5 and 10 times-tables.**
58 • Begin to know:
multiplication facts for 6, 7, 8 and 9 times-tables.
58 • **Derive quickly:**
division facts corresponding to 2, 3, 4, 5 and 10 times-tables;
doubles of all whole numbers to 50 (e.g. 38 + 38, or 38 × 2);
doubles of multiples of 10 to 500 (e.g. 460 × 2);
doubles of multiples of 100 to 5000 (e.g. 3400 × 2);
and the corresponding halves (e.g. 74 ÷ 2, ½ of 420, half of 3800).

60–65 Mental calculation strategies (× and ÷)
60 • Use doubling or halving, starting from known facts. For example:
double/halve two-digit numbers by doubling/halving the tens first;
to multiply by 4, double, then double again;
to multiply by 5, multiply by 10 then halve;
to multiply by 20, multiply by 10 then double;
find the 8 times-table facts by doubling the 4 times-table;
find quarters by halving halves.
62 • Use closely related facts (e.g. to multiply by 9 or 11, multiply by 10 and adjust; develop the ×6 table from the ×4 and ×2 tables).
62 • Partition (e.g. 23 × 4 = (20 × 4) + (3 × 4)).
62 • Use the relationship between multiplication and division.
64 • Use known number facts and place value to multiply and divide integers, including by 10 and then 100 (whole-number answers).

66–69 Pencil and paper procedures (× and ÷)
66, 68 • Approximate first. Use informal pencil and paper methods to support, record or explain multiplications and divisions.
Develop and refine written methods for TU × U, TU ÷ U.

72–73 Checking results of calculations
72 • Check with the inverse operation.
72 • Check the sum of several numbers by adding in reverse order.
72 • Check with an equivalent calculation.
72 • Estimate and check by approximating (round to nearest 10 or 100).
72 • Use knowledge of sums or differences of odd/even numbers.

NOTES • Key objectives are highlighted in **bold type**.
• Page references are to the supplement of examples for Years 4, 5 and 6

Solving problems

74–75 Making decisions

74 • **Choose and use appropriate number operations and appropriate ways of calculating (mental, mental with jottings, pencil and paper) to solve problems.**
(For examples of problems see pages 78, 82–89, 100.)

76–81 Reasoning about numbers and shapes

76 • Explain methods and reasoning about numbers orally and in writing.

78 • Solve mathematical problems or puzzles, recognise and explain patterns and relationships, generalise and predict. Suggest extensions by asking 'What if…?'

80 • Make and investigate a general statement about familiar numbers or shapes by finding examples that satisfy it.

82–89 Problems involving 'real life', money and measures

82–89 • Use all four operations to solve word problems involving numbers in 'real life', money and measures (including time), using one or more steps, including converting pounds to pence and metres to centimetres and vice versa.

Handling data

114–117 Organising and interpreting data

114, 116 • Solve a problem by collecting quickly, organising, representing and interpreting data in tables, charts, graphs and diagrams, including those generated by a computer, for example:
tally charts and frequency tables;
pictograms – symbol representing 2, 5, 10 or 20 units;
bar charts – intervals labelled in 2s, 5s, 10s or 20s;
Venn and Carroll diagrams (two criteria).

Measures, shape and space

90–101 Measures

90 • Use, read and write standard metric units (km, m, cm, mm, kg, g, l, ml), including their abbreviations, and imperial units (mile, pint).

90 • **Know and use the relationships between familiar units of length, mass and capacity.**
Know the equivalent of one half, one quarter, three quarters and one tenth of 1 km, 1 m, 1 kg, 1 litre in m, cm, g, ml. Convert up to 1000 centimetres to metres, and vice versa.

92, 94 • Suggest suitable units and measuring equipment to estimate or measure length, mass or capacity.
Record estimates and readings from scales to a suitable degree of accuracy.

96 • Measure and calculate the perimeter and area of rectangles and other simple shapes, using counting methods and standard units (cm, cm^2).

98, 100 • Use, read and write the vocabulary related to time.
Estimate/check times using seconds, minutes, hours.
Read the time from an analogue clock to the nearest minute, and from a 12-hour digital clock.
Use am and pm and the notation 9:53.
Read simple timetables and use this year's calendar.

102–111 Shape and space

102 • Describe and visualise 3-D and 2-D shapes, including the tetrahedron and heptagon.
Recognise equilateral and isosceles triangles.
Classify polygons using criteria such as number of right angles, whether or not they are regular, symmetry properties.

104 • Make shapes: for example, construct polygons by paper folding or using pinboard, and discuss properties such as lines of symmetry.
Visualise 3-D shapes from 2-D drawings and identify simple nets of solid shapes.

106 • Sketch the reflection of a simple shape in a mirror line parallel to one side (all sides parallel or perpendicular to the mirror line).

108 • Recognise positions and directions: for example, describe and find the position of a point on a grid of squares where the lines are numbered.
Recognise simple examples of horizontal and vertical lines.
Use the eight compass directions N, S, E, W, NE, NW, SE, SW.

110 • Make and measure clockwise and anti-clockwise turns: for example, from SW to N, or from 4 to 10 on a clock face.
Begin to know that angles are measured in degrees and that:
one whole turn is 360° or 4 right angles;
a quarter turn is 90° or one right angle;
half a right angle is 45°.
Start to order a set of angles less than 180°.

Oral and mental: eg counting, mental strategies, rapid recall

Unit	Days	Pages	Topic	Objectives: children will be taught to...
1	3	2–15 94–95	Place value, ordering and rounding Reading numbers from scales	
2–3	10	34–37 40–47 48–51 82–85 72–75	Understanding + and – Mental calculation strategies (+ and –) Pencil and paper procedures (+ and –) Money and 'real life' problems Making decisions and checking results	
4–6	13	86–101 102–111 76–81	Measures, including problems Shape and space Reasoning about shapes	
7	2		**Assess and review**	

Oral and mental: eg counting, mental strategies, rapid recall

8	5	16–21 76–81	Properties of numbers Reasoning about numbers	
9–10	10	52–57 60–65 66–69 82–85 72–75	Understanding × and ÷ Mental calculation strategies (× and ÷) Pencil and paper procedures (× and ÷) Money and 'real life' problems Making decisions and checking results	
11	5	22–31	Fractions and decimals	
12	5	34–37 40–47 48–51 98–101 88	Understanding + and – Mental calculation strategies (+ and –) Pencil and paper procedures (+ and –) Time, including problems	
13	5	114–117	Handling data	
14	2		**Assess and review**	
Total	60			

Oral and mental: eg counting, mental strategies, rapid recall

Unit	Days	Pages	Topic	Objectives: children will be taught to...
1	3	2–15	Place value, ordering and rounding	
		94–95	Reading numbers from scales	
2–3	10	34–37	Understanding + and –	
		40–47	Mental calculation strategies (+ and –)	
		48–51	Pencil and paper procedures (+ and –)	
		82–85	Money and 'real life' problems	
		72–75	Making decisions and checking results	
4–6	13	86–101	Measures, including problems	
		102–111	Shape and space	
		76–81	Reasoning about shapes	
7	2		**Assess and review**	

Oral and mental: eg counting, mental strategies, rapid recall

Unit	Days	Pages	Topic	Objectives: children will be taught to...
8	5	16–21	Properties of numbers	
		76–81	Reasoning about numbers	
9–10	10	52–57	Understanding × and ÷	
		60–65	Mental calculation strategies (× and ÷)	
		66–69	Pencil and paper procedures (× and ÷)	
		82–85	Money and 'real life' problems	
		72–75	Making decisions and checking results	
11	5	22–31	Fractions and decimals	
12	5	114–117	Handling data	
13	2		**Assess and review**	
Total	55			

Teaching programme: Year 5

Numbers and the number system

2–15 Place value, ordering and rounding
- 3 • Read and write whole numbers in figures and words, and know what each digit represents.
  (For decimals, see page 29.)
- 7 • **Multiply and divide any positive integer up to 10 000 by 10 or 100 and understand the effect**
  (e.g. 9900 ÷ 10, 737 ÷ 10, 2060 ÷ 100).
- 9 • Use the vocabulary of comparing and ordering numbers, including symbols such as <, >, , , =. Give one or more numbers lying between two given numbers. Order a set of integers less than 1 million.
  (For decimals, see page 29.)
- 11, 13 • Use the vocabulary of estimation and approximation. Make and justify estimates of large numbers, and estimate simple proportions such as one third, seven tenths. Round any integer up to 10 000 to the nearest 10, 100 or 1000.
  (For rounding decimals, see page 31.)
- 15 • **Order a given set of positive and negative integers** (e.g. on a number line, on a temperature scale). Calculate a temperature rise or fall across 0 °C.

16–21 Properties of numbers and number sequences
- 17 • Recognise and extend number sequences formed by counting from any number in steps of constant size, extending beyond zero when counting back. For example:
  count on in steps of 25 to 1000, and then back;
  count on or back in steps of 0.1, 0.2, 0.3…
- 19 • Make general statements about odd or even numbers, including the outcome of sums and differences.
- 19 • Recognise multiples of 6, 7, 8, 9, up to the 10th multiple. Know and apply tests of divisibility by 2, 4, 5, 10 or 100.
- 21 • Know squares of numbers to at least 10×10.
- 21 • Find all the pairs of factors of any number up to 100.

22–33 Fractions, decimals and percentages, ratio and proportion
- 23 • Use fraction notation, including mixed numbers, and the vocabulary numerator and denominator.
  Change an improper fraction to a mixed number (e.g. change $^{13}/_{10}$ to $1^{3}/_{10}$).
  Recognise when two simple fractions are equivalent, including relating hundredths to tenths (e.g. $^{70}/_{100} = ^{7}/_{10}$).
- 23 • Order a set of fractions such as 2, 2¾, 1¾, 2½, 1½, and position them on a number line.
- 25 • **Relate fractions to division**, and use division to find simple fractions, including tenths and hundredths, of numbers and quantities (e.g. ¾ of 12, ¹⁄₁₀ of 50, ¹⁄₁₀₀ of £3).
- 27 • Solve simple problems using ideas of ratio and proportion ('one for every…' and 'one in every…').
- 29 • **Use decimal notation for tenths and hundredths.**
  Know what each digit represents in a number with up to two decimal places.
  Order a set of numbers or measurements with the same number of decimal places.
- 31 • **Round a number with one or two decimal places to the nearest integer.**
- 31 • **Relate fractions to their decimal representations**: that is, recognise the equivalence between the decimal and fraction forms of one half, one quarter, three quarters… and tenths and hundredths (e.g. $^{7}/_{10} = 0.7$, $^{27}/_{100} = 0.27$).
- 33 • Begin to understand percentage as the number of parts in every 100, and find simple percentages of small whole-number quantities (e.g. 25% of £8).
  Express one half, one quarter, three quarters, and tenths and hundredths, as percentages (e.g. know that ¾ = 75%).

Calculations

38–39 Rapid recall of addition and subtraction facts
- 39 • Derive quickly or continue to derive quickly:
  decimals that total 1 (e.g. 0.2 + 0.8) or 10 (e.g. 6.2 + 3.8);
  all two-digit pairs that total 100 (e.g. 43 + 57);
  all pairs of multiples of 50 with a total of 1000 (e.g. 350 + 650).

40–47 Mental calculation strategies (+ and −)
- 41 • Find differences by counting up through next multiple of 10, 100 or 1000, e.g. **calculate mentally a difference such as 8006 − 2993.**
- 41 • Partition into H, T and U, adding the most significant digits first.
- 41 • Identify near doubles, such as 1.5 + 1.6.
- 41 • Add or subtract the nearest multiple of 10 or 100, then adjust.
- 43 • Develop further the relationship between addition and subtraction.
- 43 • Add several numbers (e.g. four or five single digits, or multiples of 10 such as 40 + 50 + 80).
- 45, 47 • Use known number facts and place value for mental addition and subtraction (e.g. 470 + 380, 810 − 380, 7.4 + 9.8, 9.2 − 8.6).

48–51 Pencil and paper procedures (+ and −)
- 49, 51 • Use informal pencil and paper methods to support, record or explain additions and subtractions. **Extend written methods to: column addition/subtraction of two integers less than 10 000;** addition of more than two integers less than 10 000; addition or subtraction of a pair of decimal fractions, both with one or both with two decimal places (e.g. £29.78 + £53.34).

52–57 Understanding multiplication and division
- 53, 55 • Understand the effect of and relationships between the four operations, and the principles (not the names) of the arithmetic laws as they apply to multiplication. Begin to use brackets.
- 57 • Begin to express a quotient as a fraction, or as a decimal when dividing a whole number by 2, 4, 5 or 10, or when dividing £.p. Round up or down after division, depending on the context.

58–59 Rapid recall of multiplication and division facts
- 59 • **Know by heart all multiplication facts up to 10×10.**
- 59 • Derive quickly or continue to derive quickly:
  division facts corresponding to tables up to 10×10;
  doubles of all whole numbers 1 to 100 (e.g. 78 × 2);
  doubles of multiples of 10 to 1000 (e.g. 670 × 2);
  doubles of multiples of 100 to 10 000 (e.g. 6500 × 2);
  and the corresponding halves.

60–65 Mental calculation strategies (× and ÷)
- 61 • Use doubling or halving, starting from known facts. For example:
  double/halve any two-digit number by doubling/halving the tens first;
  double one number and halve the other;
  to multiply by 25, multiply by 100 then divide by 4;
  find the ×16 table facts by doubling the ×8 table;
  find sixths by halving thirds.
- 61 • Use factors (e.g. $8 \times 12 = 8 \times 4 \times 3$).
- 63 • Use closely related facts (e.g. multiply by 19 or 21 by multiplying by 20 and adjusting; develop the ×12 table from the ×10 and ×2 tables).
- 63 • Partition (e.g. $47 \times 6 = (40 \times 6) + (7 \times 6)$).
- 63 • Use the relationship between multiplication and division.
- 65 • Use known facts and place value to multiply and divide mentally.

66–69 Pencil and paper procedures (× and ÷)
- 67, 69 • Approximate first. Use informal pencil and paper methods to support, record or explain multiplications and divisions.
  Extend written methods to:
  short multiplication of HTU or U.t **by U;**
  long multiplication of TU by TU;
  short division of HTU by U (with integer remainder).

70–71 Using a calculator
- 71 • Develop calculator skills and use a calculator effectively.

72–73 Checking results of calculations
- 73 • Check with the inverse operation when using a calculator.
- 73 • Check the sum of several numbers by adding in the reverse order.
- 73 • Check with an equivalent calculation.
- 73 • Estimate by approximating (round to nearest 10 or 100), then check result.
- 73 • Use knowledge of sums and differences of odd/even numbers.

NOTES • Key objectives are highlighted in **bold type**.
• Page references are to the supplement of examples for Years 4, 5 and 6.

Solving problems

74–75 Making decisions

75 • Choose and use appropriate number operations to solve problems, and appropriate ways of calculating: mental, mental with jottings, written methods, calculator.
(For examples of problems see pages 34–37, 79, 82–89, 101.)

76–81 Reasoning and generalising about numbers or shapes

77 • Explain methods and reasoning, orally and in writing.

79 • Solve mathematical problems or puzzles, recognise and explain patterns and relationships, generalise and predict. Suggest extensions asking 'What if…?'

81 • Make and investigate a general statement about familiar numbers or shapes by finding examples that satisfy it.
Explain a generalised relationship (formula) in words.

82–89 Problems involving 'real life', money and measures

82–89 • **Use all four operations to solve simple word problems involving numbers and quantities** based on 'real life', money and measures **(including time)**, using one or more steps, including making simple conversions of pounds to foreign currency and finding simple percentages.
Explain methods and reasoning.

Handling data

112–117 Organising and interpreting data

113 • Discuss the chance or likelihood of particular events.

115, 117 • Solve a problem by representing and interpreting data in tables, charts, graphs and diagrams, including those generated by a computer, for example:
bar line charts, vertical axis labelled in 2s, 5s, 10s, 20s or 100s, first where intermediate points have no meaning (e.g. scores on a dice rolled 50 times), then where they may have meaning (e.g. room temperature over time).

117 • Find the mode of a set of data.

Measures, shape and space

90–101 Measures

91 • Use, read and write standard metric units (km, m, cm, mm, kg, g, l, ml), including their abbreviations, and relationships between them. Convert larger to smaller units (e.g. km to m, m to cm or mm, kg to g, l to ml).
Know imperial units (mile, pint, gallon).

93, 95 • Suggest suitable units and measuring equipment to estimate or measure length, mass or capacity.
Measure and draw lines to the nearest millimetre.
Record estimates and readings from scales to a suitable degree of accuracy.

97 • **Understand area measured in square centimetres (cm^2). Understand and use the formula in words 'length $\times$ breadth' for the area of a rectangle.**
Understand, measure and calculate perimeters of rectangles and regular polygons.

99, 101 • Use units of time; read the time on a 24-hour digital clock and use 24-hour clock notation, such as 19:53. Use timetables.

102–111 Shape and space

103 • **Recognise properties of rectangles.**
Classify triangles (isosceles, equilateral, scalene), using criteria such as equal sides, equal angles, lines of symmetry.

105 • Make shapes with increasing accuracy.
Visualise 3-D shapes from 2-D drawings and identify different nets for an open cube.

107 • Recognise reflective symmetry in regular polygons: for example, know that a square has four axes of symmetry and an equilateral triangle has three.
Complete symmetrical patterns with two lines of symmetry at right angles (using squared paper or pegboard).
Recognise where a shape will be after reflection in a mirror line parallel to one side (sides not all parallel or perpendicular to the mirror line).
Recognise where a shape will be after a translation.

109 • Recognise positions and directions:
read and plot co-ordinates in the first quadrant;
recognise perpendicular and parallel lines.

111 • Understand and use angle measure in degrees.
Identify, estimate and order acute and obtuse angles.
Use a protractor to measure and draw acute and obtuse angles to the nearest 5°.
Calculate angles in a straight line.

Oral and mental: eg counting, mental strategies, rapid recall

Unit	Days	Pages	Topic	Objectives: children will be taught to...
1	3	2–15 70–71	Place value, ordering and rounding Using a calculator	
2–3	10	52–57 60–65 66–69 82–85 70–75	Understanding × and ÷ Mental calculation strategies (× and ÷) Pencil and paper procedures (× and ÷) Money and 'real life' problems Making decisions and checking results, including using a calculator	
4–5	10	22–33 26–27	Fractions, decimals and percentages Ratio and proportion	
6	8	112–117 70–71	Handling data Using a calculator	
7	2		**Assess and review**	

Oral and mental: eg counting, mental strategies, rapid recall

Unit	Days	Pages	Topic	Objectives: children will be taught to...
8–10	15	102–111 76–81 86–101	Shape and space Reasoning about shapes Measures, including problems	
11	5	40–47 48–51 82–85 70–75	Mental calculation strategies (+ and –) Pencil and paper procedures (+ and –) Money and 'real life' problems Making decisions and checking results, including using a calculator	
12	5	16–21 76–81	Properties of numbers Reasoning about numbers	
13	2		**Assess and review**	
Total	60			

Oral and mental: eg counting, mental strategies, rapid recall

Unit	Days	Pages	Topic	Objectives: children will be taught to...
1	3	2–15 70–71	Place value, ordering and rounding Using a calculator	
2–3	10	52–57 60–65 66–69 82–85 70–75	Understanding × and ÷ Mental calculation strategies (× and ÷) Pencil and paper procedures (× and ÷) Money and 'real life' problems Making decisions and checking results, including using a calculator	
4	5	22–33 70–71	Fractions, decimals and percentages Using a calculator	
5	8	102–111 76–81	Shape and space Reasoning about shapes	
6	2		**Assess and review**	

Oral and mental: eg counting, mental strategies, rapid recall

Unit	Days	Pages	Topic	Objectives: children will be taught to...
7–8	10	86–101 112–117	Measures, including problems Handling data	
9–10	10	40–47 48–51 82–85 70–75	Mental calculation strategies (+ and −) Pencil and paper procedures (+ and −) Money and 'real life' problems Making decisions and checking results, including using a calculator	
11	5	16–21 76–81	Properties of numbers Reasoning about numbers	
12	2		**Assess and review**	
Total	55			

Teaching programme: Year 6

Numbers and the number system

   7 • **Multiply and divide decimals mentally by 10 or 100, and integers by 1000, and explain the effect**.
(For more on place value with decimals, see page 29.)
11, 13 • Use the vocabulary of estimation and approximation.
Consolidate rounding an integer to the nearest 10, 100 or 1000.
(For rounding decimals, see page 31.)
  15 • Find the difference between a positive and a negative integer, or two negative integers, in a context such as temperature or the number line, and order a set of positive and negative integers.

  17 • Recognise and extend number sequences, such as the sequence of square numbers, or the sequence of triangular numbers 1, 3, 6, 10, 15…
Count on in steps of 0.1, 0.2, 0.25, 0.5…, and then back.
  19 • Make general statements about odd or even numbers, including the outcome of products.
  19 • Recognise multiples up to 10×10. Know and apply simple tests of divisibility. Find simple common multiples.
  21 • Recognise squares of numbers to at least 12×12.
  21 • Recognise prime numbers to at least 20.
Factorise numbers to 100 into prime factors.

  23 • Change a fraction such as $^{33}/_8$ to the equivalent mixed number $4\frac{1}{8}$, and vice versa.
Recognise relationships between fractions: for example, that $\frac{1}{10}$ is ten times $\frac{1}{100}$, and $\frac{1}{16}$ is half of $\frac{1}{8}$.
Reduce a fraction to its simplest form by cancelling common factors in the numerator and denominator**.**
  23 • Order fractions such as $\frac{2}{3}$, $\frac{3}{4}$ and $\frac{5}{6}$ by converting them to fractions with a common denominator, and position them on a number line.
  25 • **Use a fraction as an 'operator' to find fractions,** including tenths and hundredths, **of numbers or quantities (e.g. $\frac{5}{8}$ of 32, $\frac{7}{10}$ of 40, $\frac{9}{100}$ of 400 centimetres).**
  27 • **Solve simple problems involving ratio and proportion.**
  29 • Use decimal notation for tenths and hundredths in calculations, and tenths, hundredths and thousandths when recording measurements.
Know what each digit represents in a number with up to three decimal places.
Give a decimal fraction lying between two others (e.g. between 3.4 and 3.5).
Order a mixed set of numbers or measurements **with up to three decimal places.**
  31 • Round a number with two decimal places to the nearest tenth or to the nearest whole number.
  31 • Recognise the equivalence between the decimal and fraction forms of one half, one quarter, three quarters, one eighth… and tenths, hundredths and thousandths
(e.g. $^{700}/_{1000} = {}^{70}/_{100} = {}^{7}/_{10} = 0.7$).
Begin to convert a fraction to a decimal using division.
  33 • **Understand percentage as the number of parts in every 100.** Express simple fractions such as one half, one quarter, three quarters, one third, two thirds…, and tenths and hundredths, as percentages (e.g. know that $\frac{1}{3} = 33\frac{1}{3}\%$).
Find simple percentages of small whole-number quantities (e.g. find 10% of £500, then 20%, 40% and 80% by doubling).

NOTES • Key objectives are highlighted in **bold type**.
  • Page references are to the supplement of examples for Years 4, 5 and 6.

Calculations

41, 43 • Consolidate all strategies from previous year, including:
find a difference by counting up;
add or subtract the nearest multiple of 10, 100 or 1000, then adjust;
use the relationship between addition and subtraction;
add several numbers.
45, 47 • Use known number facts and place value to consolidate mental addition/subtraction (e.g. 470 + 380, 810 – 380, 7.4 + 9.8, 9.2 – 8.6).

49, 51 • Use informal pencil and paper methods to support, record or explain additions and subtractions.
Extend written methods to column addition and subtraction of numbers involving decimals.

53, 55 • Understand and use the relationships between the four operations, and the principles (not the names) of the arithmetic laws.
Use brackets.
  57 • Express a quotient as a fraction or as a decimal rounded to one decimal place. Divide £.p by a two-digit number to give £.p.
Round up or down after division, depending on the context.

  59 • Consolidate knowing by heart:
multiplication facts up to 10×10.
  59 • **Derive quickly:
division facts corresponding to tables up to 10×10;**
squares of multiples of 10 to 100 (e.g. 60×60);
doubles of two-digit numbers (e.g. 3.8×2, 0.76×2);
doubles of multiples of 10 to 1000 (e.g. 670×2);
doubles of multiples of 100 to 10000 (e.g. 6500×2);
and the corresponding halves.

  61 • Use related facts and doubling or halving. For example:
double or halve the most significant digit first;
to multiply by 25, multiply by 100 then divide by 4;
double one number and halve the other;
find the ×24 table by doubling the ×6 table twice.
  61 • Use factors (e.g. $35 \times 18 = 35 \times 6 \times 3$).
  63 • Use closely related facts: for example, multiply by 49 or 51 by multiplying by 50 and adjusting.
Develop the ×17 table by adding facts from the ×10 and ×7 tables.
  63 • Partition (e.g. $87 \times 6 = (80 \times 6) + (7 \times 6)$;
$3.4 \times 3 = (3 \times 3) + (0.4 \times 3)$).
  63 • Use the relationship between multiplication and division.
  65 • Use known number facts and place value to consolidate mental multiplication and division.

67, 69 • Approximate first. Use informal pencil and paper methods to support, record or explain multiplications and divisions.
Extend written methods to:
multiplication of ThHTU $\times$ U (short multiplication);
**short multiplication of numbers involving decimals;
long multiplication of a three-digit by a two-digit integer;**
short division of TU or HTU by U (mixed-number answer);
division of HTU by TU (long division, whole-number answer);
short division of numbers involving decimals.

  71 • Develop calculator skills and use a calculator effectively.

  73 • Check with the inverse operation when using a calculator.
  73 • Check the sum of several numbers by adding in reverse order.
  73 • Check with an equivalent calculation.
  73 • Estimate by approximating (round to nearest 10, 100 or 1000), then check result.
  73 • Use knowledge of sums, differences, products of odd/even numbers.
  73 • Use tests of divisibility.

Solving problems

74–75 Making decisions

75 • Choose and use appropriate number operations to solve problems, and appropriate ways of calculating: mental, mental with jottings, written methods, calculator.
(For examples of problems see pages 34–37, 79, 82–89, 101.)

76–81 Reasoning and generalising about numbers or shapes

77 • Explain methods and reasoning, orally and in writing.

79 • Solve mathematical problems or puzzles, recognise and explain patterns and relationships, generalise and predict. Suggest extensions asking 'What if…?'

81 • Make and investigate a general statement about familiar numbers or shapes by finding examples that satisfy it. Develop from explaining a generalised relationship in words to expressing it in a formula using letters as symbols (e.g. the cost of *n* articles at 15p each).

82–89 Problems involving 'real life', money or measures

82–89 • **Identify and use appropriate operations (including combinations of operations) to solve word problems involving numbers and quantities** based on 'real life', money or measures (including time), using one or more steps, including converting pounds to foreign currency, or vice versa, and calculating percentages such as VAT.
Explain methods and reasoning.

Handling data

112–117 Handling data

113 • Use the language associated with probability to discuss events, including those with equally likely outcomes.

115, 117 • **Solve a problem by** representing, **extracting and interpreting data in tables, graphs, charts** and diagrams, including those generated by a computer, for example:
line graphs (e.g. for distance/time, for a multiplication table, a conversion graph, a graph of pairs of numbers adding to 8);
frequency tables and bar charts with grouped discrete data (e.g. test marks 0–5, 6–10, 11–15…).

117 • Find the mode and range of a set of data.
Begin to find the median and mean of a set of data.

Measures, shape and space

90–101 Measures

91 • Use, read and write standard metric units (km, m, cm, mm, kg, g, l, ml, cl), including their abbreviations, and relationships between them. Convert smaller to larger units (e.g. m to km, cm or mm to m, g to kg, ml to l) and vice versa.
Know imperial units (mile, pint, gallon, lb, oz).
Know rough equivalents of lb and kg, oz and g, miles and km, litres and pints or gallons.

93, 95 • Suggest suitable units and measuring equipment to estimate or measure length, mass or capacity.
Record estimates and readings from scales to a suitable degree of accuracy.

97 • **Calculate the perimeter and area of simple compound shapes that can be split into rectangles.**

99, 101 • Appreciate different times around the world.

102–111 Shape and space

103, 109 • Describe and visualise properties of solid shapes such as parallel or perpendicular faces or edges.
Classify quadrilaterals, using criteria such as parallel sides, equal angles, equal sides…

105 • Make shapes with increasing accuracy.
Visualise 3-D shapes from 2-D drawings and identify different nets for a closed cube.

107 • Recognise where a shape will be after reflection:
in a mirror line touching the shape at a point (sides of shape not necessarily parallel or perpendicular to the mirror line);
in two mirror lines at right angles (sides of shape all parallel or perpendicular to the mirror line).
Recognise where a shape will be after two translations.

109 • **Read and plot co-ordinates in all four quadrants.**

111 • Recognise and estimate angles.
Use a protractor to measure and draw **acute and obtuse angles to the nearest degree.**
Check that the sum of the angles of a triangle is 180°: for example, by measuring or paper folding.
Calculate angles in a triangle or around a point.
Recognise where a shape will be after a rotation through 90° about one of its vertices.

Oral and mental: eg counting, mental strategies, rapid recall

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1	3	2–15 70–71	Place value, ordering and rounding Using a calculator	
2–3	10	52–57 60–65 66–69 82–85 70–75	Understanding × and ÷ Mental calculation strategies (× and ÷) Pencil and paper procedures (× and ÷) Money and 'real life' problems Making decisions and checking results, including using a calculator	
4–5	10	22–33 26–27	Fractions, decimals and percentages Ratio and proportion	
6	8	112–117 70–71	Handling data Using a calculator	
7	2		**Assess and review**	

Oral and mental: eg counting, mental strategies, rapid recall

Unit	Days	Pages	Topic	Objectives: children will be taught to...
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Total	55			