Year 2

2.1 NUMBER SENSE
3-week sequence

Success criteria
Pupils can represent and explain what happens when counting forwards and backwards in tens and can compare and order two-digit numbers in different contexts.

> *I can choose some equipment to show how the numbers change when you count up in tens from 27 to 97 and back from 97 to 27 and explain what is happening. I can order the heights of the three little pigs, mark them on a number line and explain how I know which is shortest.*

Learning objectives
Pupils should be taught to:

Number, place value and rounding
- count in steps of 2 and 5 from 0 and in tens from any number, forward and backward
- recognise the place value of each digit in a two-digit number (tens, ones)
- identify, represent and estimate numbers using different representations, including the number line
- compare and order numbers from 0 up to 100
- read and write numbers to at least 100 in numerals
- use place value and number facts to solve problems

Measurement
- compare and order lengths, mass, volume / capacity
- compare and sequence intervals of time

Statistics
- ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity.

Guidance
Using materials and a range of representations, pupils practise counting, reading, writing and comparing numbers to at least 100 and solving a variety of related problems to develop fluency.

As they become more confident with numbers up to 100, pupils are introduced to larger numbers to develop further their recognition of patterns within the number system and represent them in different ways, including spatial representations.

Pupils should partition numbers in different ways (for example, 23 = 20 + 3 and 23 = 10 + 13) to support subtraction. They become fluent and apply their knowledge of numbers to reason with, discuss and solve problems that emphasise the value of each digit in two-digit numbers. They begin to understand zero as a place holder.

2.2 ADDITIVE REASONING
3-week sequence

Success criteria
Pupils can represent and solve addition and subtraction problems in different contexts, appropriately choosing and using number facts, understanding of place value and counting.

> *I can choose equipment to show and explain how I know I have saved £53 when I had £33 in my piggy bank and my granny gave me £20. I can choose equipment to show and explain how I know I have 42p left when I started with 48p and spent 6p on a bookmark at the school fair.*

Learning objectives
Pupils should be taught to:

Number and place value
- *count in tens from any number, forward and backward*
- *recognise the place value of each digit in a two-digit number (tens, ones)*
- *use place value and number facts to solve problems*

Addition and subtraction
- solve problems with addition and subtraction:
  - using concrete objects and pictorial representations, including those involving numbers, quantities and measures
  - applying their increasing knowledge of mental methods
- recall and use addition and subtraction facts to 20 fluently
- add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
  - a two-digit number and ones
  - a two-digit number and tens
  - adding three one-digit numbers

Measurement
- solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change

Statistics
- ask and answer questions about totalling and comparing categorical data.

Guidance
Pupils practise addition and subtraction to 20 to become increasingly fluent in deriving facts such as using 3 + 7 =10, 10 – 7 = 3 and 7 = 10 – 3 to calculate 30 + 70 = 100, 100 – 70 = 30 and 70 = 100 – 30. They check their calculations, including by adding to check subtraction and adding numbers in a different order to check addition (e.g. 5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5). This establishes commutativity and associativity of addition.

For further guidance see appendix.

2.3 GEOMETRIC REASONING

2-week sequence

Success criteria

Pupils can recognise and identify shapes in their environment and explain the properties of the shapes including lines of symmetry.

I can find four different quadrilaterals around the school, explain what is the same and what is different about them and identify lines of symmetry in each shape.

Learning objectives

Pupils should be taught to:

Geometry: properties of shapes
- identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line
- identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces
- identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]
- compare and sort common 2-D and 3-D shapes and everyday objects

Geometry: position and direction
- order and arrange combinations of mathematical objects in patterns and sequences

- use mathematical vocabulary to describe position, direction and movement.

Guidance

Pupils handle and name a wide variety of common 2-D and 3-D shapes including: quadrilaterals and polygons, and cuboids, prisms and cones, and identify the properties of each shape (for example, number of sides, number of faces). Pupils identify, compare and sort shapes on the basis of their properties and use vocabulary precisely, such as sides, edges, vertices and faces.

Pupils should work with patterns of shapes, including those in different orientations

Pupils draw lines and shapes using a straight edge.

2.4 NUMBER SENSE

2-week sequence

Success criteria

Pupils can represent and explain how they know ten more and ten less than any given number and read, compare and record comparison of numbers up to 100.

I can choose some equipment to show and explain how I know ten more than 64 and use this to explain ten more than 364. I can choose some equipment to show and explain how I know ten less than 86 and use this to explain ten less than 486. I can order the weights 17 g, 70 g and 71 g, use the symbols < or > to record the correct order and explain how I know.

Learning objectives

Pupils should be taught to:

- *count in steps of 2 and 5 from 0 and in tens from any number, forward and backward*
- *recognise the place value of each digit in a two-digit number (tens, ones)*
- *identify, represent and estimate numbers using different representations, including the number line*
- *compare and order numbers from 0 up to 100;* use <, > and = signs
- *read and write numbers to at least 100 in numerals*
- *use place value and number facts to solve problems*

Measurement
- *compare and order lengths, mass, volume / capacity* and record the results using >, < and =
- *compare and sequence intervals of time*

Statistics
- *ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity.*

Guidance

For guidance see 2.1 and appendix.

2.5 ADDITIVE REASONING

Success criteria

Pupils can represent, explain and record the relationship between addition and subtraction. They can represent and solve addition and subtraction problems in different contexts, appropriately choosing and using number facts, understanding of place value and counting.

> *I can choose equipment to show and explain the relationship between 3, 7 and 10, record at least four related number sentences (e.g. 3 + 7 = 10, 10 = 7 + 3, 10 – 3 = 7…) and use this to explain the relationship between 30, 70 and 100. I can explain how knowing 3 + 2 = 5 helps me to solve 50p – 20p.*

Learning objectives

Pupils should be taught to:

- *count in tens from any number, forward and backward*
- *recognise the place value of each digit in a two-digit number (tens, ones)*
- *use place value and number facts to solve problems*

Addition and subtraction

- *solve problems with addition and subtraction:*
  - *using concrete objects and pictorial representations, including those involving numbers, quantities and measures*
  - *applying their increasing knowledge of mental methods*
- *recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100*
- *add and subtract numbers using concrete objects, pictorial representations, and mentally, including:*
  - *a two-digit number and ones*
  - *a two-digit number and tens*
  - *adding three one-digit numbers*

- show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
- recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems

Measurement

- recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- find different combinations of coins to equal the same amounts of money
- *solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change*

Statistics

- *ask and answer questions about totalling and comparing categorical data.*

Guidance

For guidance see 2.2 and appendix.

2.6 NUMBER SENSE

Success criteria

Pupils can use their understanding of counting in twos, fives and tens to interpret data. They can represent and explain the difference between odd and even numbers and use this understanding to identify large multiples of two.

> *I can use my counting in twos to help me draw a pictogram to show flowers with different numbers of petals growing in the school grounds, using one picture to represent two flowers. I can explain why, when sorting 137 socks into pairs, there will be one sock left over.*

Learning objectives

Pupils should be taught to:

Number and place value

- *count in steps of 2, 3 and 5 from 0 and in tens from any number, forward and backward*

Multiplication and division

- recognise odd and even numbers

Statistics

- interpret and construct simple pictograms, tally charts, block diagrams and simple tables

- *ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity.*

Guidance

Pupils record, interpret, collate, organise and compare information (for example, using many-to-one correspondence in pictograms with simple ratios 2, 5, 10).

For further guidance see 2.1.

2.7 MULTIPLICATIVE REASONING

3-week sequence

Success criteria

Pupils can represent and explain how to use their multiplication facts to solve division problems. They can represent and solve multiplication and division problems in different contexts.

I can show and explain how knowing 5 × 10 = 50 helps me to solve the problem "How many tents will we need for 50 children if there are five children to each tent?" and record a related number sentence. I can show and explain how I know I can use 1 ps or 2 ps or 5 ps or 10 ps to make 30 p and record matching number sentences, e.g. 5 p × 6 = 30 p.

Learning objectives

Pupils should be taught to:

Number and place value
- *count in steps of 2, 3 and 5 from 0 and in tens from any number, forward and backward*

Multiplication and division
- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, *including recognising odd and even numbers*
- calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
- show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

Measurement
- *recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value*

- find different combinations of coins to equal the same amounts of money
- tell and write the time to five minutes
- know the number of minutes in an hour and the number of hours in a day.

Guidance

Pupils are introduced to the multiplication tables. They practise to become fluent in the 2, 5 and 10 multiplication tables and connect them to each other. They connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face. They begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations.

Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition. They begin to relate these to fractions and measures (for example, 40 ÷ 2 = 20, 20 is a half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (for example, 4 × 5 = 20 and 20 ÷ 5 = 4).

For further guidance see appendix.

2.8 NUMBER SENSE

3-week sequence

Success criteria

Pupils can measure in different contexts, choosing the appropriate unit and equipment and reading the scales to the nearest number.

I can explain why I chose a particular ruler to measure the height of my plant in my science experiment, and I can keep a record of the height of my plant throughout the experiment. I can use a thermometer to measure and record the temperature in different parts of the school to find the warmest place for my plant.

Learning objectives

Pupils should be taught to:

Number and place value
- *count in steps of 2, 3 and 5 from 0 and in tens from any number, forward and backward*
- *recognise the place value of each digit in a two-digit number (tens, ones)*
- *identify, represent and estimate numbers using different representations, including the number line*
- *compare and order numbers from 0 up to 100; use <, > and = signs*
- *read and write numbers to at least 100 in numerals*
- *use place value and number facts to solve problems*

Measurement
- choose and use appropriate standard units to estimate and measure length / height in any direction (m / cm); mass (kg / g); temperature (°C); capacity (litres / ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels
- *compare and order lengths, mass, volume / capacity and record the results using >, < and =*
- *compare and sequence intervals of time.*

Guidance

For guidance see 2.1.

2.9 ADDITIVE REASONING
2-week sequence

Success criteria
Pupils can represent and solve addition and subtraction problems involving two two-digit numbers in different contexts, appropriately choosing and using number facts, understanding of place value and counting.

> *I can show and explain how to total the weight of the big billy goat gruff, 42 kg, and the middle billy goat gruff, 25 kg, and how to work out how heavy the little billy goat gruff must be if they weigh 80 kg altogether, recording matching number sentences.*

Learning objectives
Pupils should be taught to:

Number and place value
- *count in tens from any number, forward and backward*
- *recognise the place value of each digit in a two-digit number (tens, ones)*
- *use place value and number facts to solve problems*

Addition and subtraction
- *solve problems with addition and subtraction:*
  - *using concrete objects and pictorial representations, including those involving numbers, quantities and measures*
  - *applying their increasing knowledge of mental methods*
- *recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100*
- *add and subtract numbers using concrete objects, pictorial representations, and mentally, including:*
  - *a two-digit number and ones*
  - *a two-digit number and tens*
  - *two two-digit numbers*
  - *adding three one-digit numbers*

- *show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot*
- *recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems*

Measurement
- *recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value*
- *find different combinations of coins to equal the same amounts of money*
- *solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change*

Statistics
- *ask and answer questions about totalling and comparing categorical data.*

Guidance
For guidance see 2.2 and appendix.

2.10 GEOMETRIC REASONING
3-week sequence

Success criteria
Pupils can identify different possible 3-D shapes from seeing one of the faces and describe the properties of the face (2-D shape) and the 3-D shapes.

> *I can identify a square face on a 3-D shape and suggest different shapes it could be (e.g. a cube, a cuboid, a square-based pyramid) and shapes it could not be (e.g. a cylinder, a sphere) and explain why.*

Learning objectives
Pupils should be taught to:

Geometry: properties of shape
- *identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line*
- *identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces*
- *identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]*
- *compare and sort common 2-D and 3-D shapes and everyday objects*

Geometry: position and direction
- *order and arrange combinations of mathematical objects in patterns and sequences*
- *use mathematical vocabulary to describe position, direction and movement.*

Guidance
Pupils draw lines and shapes, including those in different orientations.

For further guidance see 2.3.

2.11 NUMBER SENSE

3-week sequence

Success criteria

Pupils can measure in different contexts, choosing the appropriate unit and equipment and reading the scales to the nearest number.

I can explain which equipment I would use to measure rainwater being collected in a bowl and I can keep a record of the water collected each day for two weeks. I can use a clock to measure and record how long it takes my friends to do a trail around the school, record the different times and identify who was fastest.

Learning objectives

Pupils should be taught to:

Number and place value

- *count in steps of 2, 3 and 5 from 0 and in tens from any number, forward and backward*
- *recognise the place value of each digit in a two-digit number (tens, ones)*
- *identify, represent and estimate numbers using different representations, including the number line*
- *compare and order numbers from 0 up to 100; use <, > and = signs*
- *read and write numbers to at least 100 in numerals* and in words
- *use place value and number facts to solve problems*

Measurement

- *choose and use appropriate standard units to estimate and measure length / height in any direction (m / cm); mass (kg / g); temperature (°C); capacity (litres / ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels*

- *compare and order lengths, mass, volume / capacity and record the results using >, < and =*
- *compare and sequence intervals of time*

Statistics

- *interpret and construct simple pictograms, tally charts, block diagrams and simple tables*
- *ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity.*

Guidance

Pupils use standard units of measurement with increasing accuracy, using their knowledge of the number system. They use the appropriate language and record using standard abbreviations.

For further guidance see 2.1.

2.12 ADDITIVE REASONING

3-week sequence

Success criteria

Pupils can represent and solve addition and subtraction problems involving two two-digit numbers in different contexts, appropriately choosing and using number facts, understanding place value and counting.

I can show and explain how I know how much water is needed altogether to fill two water trays, when one holds 65 litres and the other holds 26 litres, and record a matching number sentence. I can show and explain how I know that our sand tray holds 20 litres more than the class next door when ours holds 75 litres and theirs holds 55 litres, recording a matching number sentence.

Learning objectives

Pupils should be taught to:

Number and place value

- *count in tens from any number, forward and backward*
- *recognise the place value of each digit in a two-digit number (tens, ones)*
- *use place value and number facts to solve problems*

Addition and subtraction

- *solve problems with addition and subtraction:*
  - *using concrete objects and pictorial representations, including those involving numbers, quantities and measures*
  - *applying their increasing knowledge of mental methods and written methods*
- *recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100*

- *add and subtract numbers using concrete objects, pictorial representations, and mentally, including:*
  - *a two-digit number and ones*
  - *a two-digit number and tens*
  - *two two-digit numbers*
  - *adding three one-digit numbers*
- *show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot*
- *recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems*

Statistics

- *ask and answer questions about totalling and compare categorical data.*

Guidance

For guidance see 2.2 and appendix.

2.13 MULTIPLICATIVE REASONING

3-week sequence

Success criteria

Pupils can represent and explain how to find halves, thirds and quarter in the context of both discrete objects and continuous measures. They can show and tell the time, on an analogue clock, including quarter past and quarter to the hour.

I can compare two pieces of ribbon and explain how I know that one piece is a third of the other. I can show and explain how to share a cake between four people, how to share a packet of biscuits between four people and set the clock for quarter past four when they have a snack.

Learning objectives

Pupils should be taught to:

Number and place value

● count in steps of 2, 3 and 5 from 0 and in tens from any number, forward and backward

Multiplication and division

● recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
● calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (<u>x</u>), division (÷) and equals (=) signs
● show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
● solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

Fractions

● <u>recognise, find, name and write fractions ⅓, ¼, ²⁄₄ and ¾ of a length, shape, set of objects or quantity</u>
● <u>write simple fractions for example ½ of 6 = 3 and recognise the equivalence of ²⁄₄ and ½.</u>

Measurement

● *tell and write the time to five minutes*, <u>including quarter past / to the hour and draw the hands on a clock face to show these times</u>
● *know the number of minutes in an hour and the number of hours in a day.*

Guidance

Pupils use fractions as 'fractions of' discrete and continuous quantities by solving problems using shapes, objects and quantities. They connect unit fractions to equal sharing and grouping, to numbers when they can be calculated, and to measures, finding fractions of lengths, quantities, a set of objects or shapes. They meet ¾ as the first example of a non-unit fraction.

Pupils should count in fractions up to 10, starting from any number and using the ½ and ²⁄₄ equivalence on the number line (for example, 1¼, 1²⁄₄ [or 1½], 1¾, 2). This reinforces the concept of fractions as numbers and that they can add up to more than one.

They become fluent in telling the time on analogue clocks and recording it.

For additional guidance see 2.7.

2.14 GEOMETRIC REASONING

2-week sequence

Success criteria

Pupils can use their understanding of fractions to talk about shapes and movement (turns) and solve related problems.

I can explain how to programme a programmable toy to draw a rectangle on paper and then go back the way it came.

Learning objectives

Pupils should be taught to:

Geometry: properties of shape

● *identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line*
● *identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces*
● *identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]*
● *compare and sort common 2-D and 3-D shapes and everyday objects*

Geometry: position and direction

● *order and arrange combinations of mathematical objects in patterns and sequences*
● *use mathematical vocabulary to describe position, direction and movement,* <u>including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)</u>

Fractions

● *recognise, find, name and write fractions ⅓, ¼, ²⁄₄ and ¾ of a length, shape, set of objects or quantity*
● *write simple fractions for example, ½ of 6 = 3 and recognise the equivalence of ²⁄₄ and ½.*

Guidance

Pupils use the concept and language of angles to describe 'turn' by applying rotations, including in practical contexts (for example, pupils themselves moving in turns, giving instructions to other pupils to do so, and programming robots using instructions given in right angles).

For further guidance see 2.3.