

Mathematics Syllabus – Year 4

4.1 NUMBER AND ALGEBRA

Learning Outcome	Notes
<p>* Counting, properties of numbers and number sequences</p>	
<ul style="list-style-type: none"> Count larger collections by grouping them. 	<p>e.g. in tens, then other numbers.</p>
<ul style="list-style-type: none"> Describe and extend simple number sequences: 	
<p>4.1.1 Count on or back in ones or tens or hundreds, starting from any two- or three-digit number;</p>	
<p>count on or back in twos starting from any two-digit number, and recognise odd and even numbers to at least 100;</p>	
<p>count on in steps of 3, 4 or 5 from any small number to at least 50, then back again.</p>	
<ul style="list-style-type: none"> Recognise and extend number sequences formed by counting from any number in steps of constant size. 	<p>e.g. Count on in steps of 25 to 500. N.B. Exclude counting beyond zero when counting back.</p>
<ul style="list-style-type: none"> Recognise two-digit and three-digit multiples of 2, 5 or 10, and three-digit multiples of 50 and 100. 	
<p>* Place-value and ordering</p>	
<p>4.1.2 Read, write and order whole numbers to at least 1000 in figures and words. Know what each digit represents.</p>	
<ul style="list-style-type: none"> Read and write whole numbers to at least 10 000 in figures and words, and know what each digit represents. 	
<ul style="list-style-type: none"> Know what each digit represents, and partition three-digit numbers into a multiple of 100, a multiple of ten and ones (HTU). 	
<ul style="list-style-type: none"> Partition numbers into thousands, hundreds, tens and ones. 	
<ul style="list-style-type: none"> Add/Subtract 1, 10, 100 or 1000 to/from any integer (whole number), and count on or back in tens, hundreds or thousands from any whole number up to 10 000. 	

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4.1 NUMBER AND ALGEBRA (contd)

Learning Outcome	Notes
* Place-value and ordering (contd)	
<ul style="list-style-type: none"> Read and begin to write the vocabulary of comparing and ordering numbers, including ordinal numbers to at least 100. 	
<ul style="list-style-type: none"> Read and write the vocabulary of comparing and ordering numbers. 	
4.1.3 Use symbols correctly, including less than (<), greater than (>), equals (=).	
<ul style="list-style-type: none"> Compare two given three-digit numbers, say which is more or less, and give a number which lies between them. 	
<ul style="list-style-type: none"> Give one or more numbers lying between two given numbers and order a set of whole numbers less than 10 000. 	
<ul style="list-style-type: none"> Say the number that is 1, 10 or 100 more or less than any given two- or three-digit number. 	
<ul style="list-style-type: none"> Order whole numbers to at least 1000, and position them on a number line. 	
* Estimating and rounding	
<ul style="list-style-type: none"> Read and begin to write the vocabulary of estimation and approximation. 	
<ul style="list-style-type: none"> Give a sensible estimate of up to about 100 objects. 	
<ul style="list-style-type: none"> Round any two-digit number to the nearest 10 and any three-digit number to the nearest 100. 	
* Fractions	
4.1.4 Recognise unit fractions and use them to find fractions of shapes and numbers.	
<ul style="list-style-type: none"> Begin to recognise simple fractions that are several parts of a whole. 	<p>such as $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{10}$.</p> <p>such as $\frac{3}{4}$, $\frac{2}{3}$, $\frac{3}{10}$.</p>

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4.1 NUMBER AND ALGEBRA (contd)

Learning Outcome	Notes
<p>* Fractions (contd)</p>	
<p>Use fraction notation.</p> <p>4.1.5 Recognise simple fractions that are several parts of a whole, and mixed numbers; recognise the equivalence of simple fractions.</p>	<p>such as $\frac{2}{3}$ or $\frac{5}{8}$.</p> <p>such as $5\frac{3}{4}$.</p> <p>e.g. fractions equivalent to $\frac{1}{2}$, $\frac{1}{4}$ or $\frac{3}{4}$.</p>
<ul style="list-style-type: none"> • Begin to recognise simple equivalent fractions. 	<p>e.g. five tenths and one half, five fifths and one whole.</p>
<ul style="list-style-type: none"> • Compare familiar fractions. 	<p>e.g. know that on the number line one half lies between one quarter and three quarters.</p>
<ul style="list-style-type: none"> • Estimate a simple fraction. 	
<p>* Understanding addition and subtraction</p>	
<ul style="list-style-type: none"> • 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 +, −, = signs. 	
<ul style="list-style-type: none"> • 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. 	
<ul style="list-style-type: none"> • Extend understanding that subtraction is the inverse of addition. 	
<ul style="list-style-type: none"> • Consolidate understanding of relationship between + and −. 	
<ul style="list-style-type: none"> • Understand the principles (not the names) of the commutative and associative laws as they apply or not to addition and subtraction. 	
<p>* Rapid recall of addition and subtraction facts</p>	
<p>4.1.6 Know by heart: all addition and subtraction facts for each number to 20.</p>	
<p>all pairs of multiples of 100 with a total of 1000.</p>	<p>e.g. $300 + 700$</p>

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4.1 NUMBER AND ALGEBRA (contd)

Learning Outcome	Notes
* Rapid recall of addition and subtraction facts (contd)	
<ul style="list-style-type: none"> Consolidate knowing by heart: addition and subtraction facts for all numbers to 20. 	
<ul style="list-style-type: none"> Derive quickly: <ul style="list-style-type: none"> all pairs of multiples of 5 with a total of 100. all number pairs that total 100. all pairs of multiples of 50 with a total of 1000. 	e.g. $35 + 65$ e.g. $62 + 38, 75 + 25, 40 + 60$ e.g. $850 + 150$
* Mental calculation strategies (+ and –)	
<ul style="list-style-type: none"> Use knowledge that addition can be done in any order to do mental calculations more efficiently: <ul style="list-style-type: none"> put the larger number first and count on; add three or four small numbers by putting the larger 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; partition into tens and units, then recombine. 	e.g. $47 + 8 = 45 + 2 + 5 + 3 = 50 + 5 = 55$ e.g. $34 + 53 = 30 + 50 + 4 + 3$
<ul style="list-style-type: none"> Continue to use the relationship between addition and subtraction. <ul style="list-style-type: none"> Add three or four small numbers, finding pairs totalling 10, or 9 or 11. 	
<ul style="list-style-type: none"> Count on or back in repeated steps of 1, 10 or 100. 	
<ul style="list-style-type: none"> Partition into tens and units, adding the tens first. 	
<ul style="list-style-type: none"> Find a small difference by counting up from the smaller to the larger number. 	e.g. $102 - 97$
<ul style="list-style-type: none"> Find a small difference by counting up. 	e.g. $5003 - 4996$
<ul style="list-style-type: none"> Identify near doubles, using doubles already known. 	e.g. $80 + 81; 150 + 160$
4.1.7 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.	

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4.1 NUMBER AND ALGEBRA (contd)

Learning Outcome	Notes
* Mental calculation strategies (+ and –) (contd)	
<ul style="list-style-type: none"> • Add or subtract the nearest multiple of 10, then adjust. • Add three two-digit multiples of 1 – 10. • Use patterns of similar calculations. • Say or write a subtraction statement corresponding to a given addition statement, and vice versa. • Use known number facts and place value to add/subtract mentally. 	such as $40 + 70 + 50$.
4.1.8 Use known number facts and place value to add or subtract mentally, including any pair of two-digit whole numbers.	
<ul style="list-style-type: none"> • Bridge through a multiple of 10, then adjust. 	
* Pencil and paper procedures (+ and –)	
<ul style="list-style-type: none"> • Use informal pencil and paper methods to support, record or explain $HTU \pm TU$, $HTU \pm HTU$. • Begin to use column addition and subtraction for $HTU \pm TU$ where the calculation cannot easily be done mentally. 	
* Understanding multiplication and division	
<ul style="list-style-type: none"> • Understand multiplication as repeated addition. • Read and begin to write the related vocabulary. • Extend understanding that multiplication can be done in any order. • Extend understanding of the operations of \times and \div, and their relationship to each other and to $+$ and $-$. 	

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4.1 NUMBER AND ALGEBRA (contd)

Learning Outcome	Notes
* Understanding multiplication and division (contd)	
4.1.9 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.	
<ul style="list-style-type: none"> • Begin to find remainders after simple division. 	
<ul style="list-style-type: none"> • Round up or down after division, depending on the context. 	e.g. Share 13 apples among 4 children.
<ul style="list-style-type: none"> • Understand the principles (not the names) of the commutative, associative and distributive laws as they apply to multiplication. 	
* Rapid recall of multiplication and division facts	
4.1.10 Know by heart: multiplication facts for the 2, 5 and 10 times-tables. Begin to know the 3 and 4 times-tables.	
Know by heart: multiplication facts for 3 and 4 times-tables. Begin to know multiplication facts for 8 times-table.	
<ul style="list-style-type: none"> • Derive quickly: division facts corresponding to the 2, 5 and 10 times-tables; 	
<ul style="list-style-type: none"> • doubles of all whole numbers to at least 20; 	e.g. $17 + 17$ or 17×2
<ul style="list-style-type: none"> • doubles of multiples of 5 to 100; 	e.g. 75×2 , 90×2
<ul style="list-style-type: none"> • doubles of multiples of 50 to 500; 	e.g. 450×2
<ul style="list-style-type: none"> • and all the corresponding halves. 	e.g. $36 \div 2$, half of 130, $900 \div 2$
4.1.11 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

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4.1 NUMBER AND ALGEBRA (contd)

Learning Outcome	Notes
* Mental calculation strategies (\times and \div)	
<ul style="list-style-type: none"> To multiply by 10/100, shift the digits one/two places to the left. 	
<ul style="list-style-type: none"> Use doubling or halving, starting from known facts. 	e.g. 8×4 is double 4×4 .
<ul style="list-style-type: none"> 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. 	
<ul style="list-style-type: none"> Say or write a division statement corresponding to a given multiplication statement. 	
<ul style="list-style-type: none"> Use the relationship between multiplication and division. 	
<ul style="list-style-type: none"> Use known number facts and place value to carry out mentally simple multiplications and divisions. 	
* Checking results of calculations	
<ul style="list-style-type: none"> Check subtraction with addition, halving with doubling and division with multiplication. 	
<ul style="list-style-type: none"> Check with the inverse operation. 	
<ul style="list-style-type: none"> Repeat addition or multiplication in a different order. 	
<ul style="list-style-type: none"> Check the sum of several numbers by adding in reverse order. 	
<ul style="list-style-type: none"> Check with an equivalent calculation. 	e.g. $18 + 7 = 25$ (bridging through 20 and counting on: $18 + 2 + 5 = 20 + 5 = 25$) or $18 + 7 = 25$ (counting on from 8)

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4.2 MEASURES, SHAPE AND SPACE

Learning Outcome	Notes
* Measures	
<ul style="list-style-type: none"> Read and begin to write the vocabulary related to length, mass and capacity. 	
<ul style="list-style-type: none"> Measure and compare using standard units, including using a ruler to draw and measure lines to the nearest half centimetre. 	km, m, cm, kg, g, l, ml
<ul style="list-style-type: none"> Know the relationships between kilometres and metres, metres and centimetres, kilograms and grams, litres and millilitres. 	
<ul style="list-style-type: none"> Begin to use decimal notation for metres and centimetres. 	
<ul style="list-style-type: none"> Suggest suitable units and measuring equipment to estimate or measure length, mass or capacity. 	
<ul style="list-style-type: none"> Read scales to the nearest division (labelled or unlabelled). 	
<ul style="list-style-type: none"> Record estimates and measurements to the nearest whole or half unit or in mixed units. 	e.g. ‘about 3.5kg’ e.g. ‘3m and 20cm’
<ul style="list-style-type: none"> Read and begin to write the vocabulary related to time. 	
4.2.1 Use units of time and know the relationships between them.	
<ul style="list-style-type: none"> Suggest suitable units to estimate or measure time. 	second, minute, hour, day, week, month, year.
<ul style="list-style-type: none"> Use a calendar. 	
<ul style="list-style-type: none"> Read the time to 5 minutes on an analogue clock and a 12-hour digital clock and use the notation 9:40. 	
* Shape and space	
<ul style="list-style-type: none"> Classify and describe 3-D and 2-D shapes, including the semi-circle, referring to properties, such as reflective symmetry, 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. 	

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4.2 MEASURES, SHAPE AND SPACE (contd)

Learning Outcome	Notes
<p>* Shape and space (contd)</p>	
<ul style="list-style-type: none"> • Make and describe shapes and patterns. 	e.g. explore the different shapes that can be made from four cubes.
<ul style="list-style-type: none"> • Relate solid shapes to pictures of them. 	
<p>4.2.2 Identify and sketch lines of symmetry in simple shapes, and recognise shapes with no lines of symmetry.</p>	
<ul style="list-style-type: none"> • Sketch the reflection of a simple shape in a mirror line along one edge. 	
<ul style="list-style-type: none"> • Read and begin to write the vocabulary related to position, direction and movement. 	e.g. describe and find the position of a square on a grid of squares with rows and columns labelled.
<ul style="list-style-type: none"> • Recognise and use the four compass directions. 	N, S, E, W
<ul style="list-style-type: none"> • Make and describe right-angled turns, including turns between the four compass points. 	
<p>4.2.3 Identify right angles in 2-D shapes and the environment.</p>	
<ul style="list-style-type: none"> • Recognise that a straight line is equivalent to two right angles. 	
<ul style="list-style-type: none"> • Compare angles with a right angle. 	

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4.3 DATA HANDLING

Learning Outcome	Notes
* Organising and using data	
<ul style="list-style-type: none">Solve a given problem by organising and interpreting numerical data in simple lists, tables and graphs.	e.g. simple frequency tables; pictograms – symbol representing two units; bar charts – intervals labelled in ones then twos.

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4.4 PROBLEM SOLVING

Learning Outcome	Notes
* Making decisions	
4.4.1 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.
* Reasoning about numbers or shapes	
<ul style="list-style-type: none"> Solve mathematical problems or puzzles, recognise simple patterns and relationships, generalise and predict. Suggest extensions. 	e.g. by asking What if ...? or What could I try next?
<ul style="list-style-type: none"> Investigate a general statement about familiar numbers or shapes by finding examples that satisfy it. 	e.g. Colour the shapes with the same number of sides.
<ul style="list-style-type: none"> Explain methods and reasoning orally and, where appropriate, in writing. 	
* Problems involving ‘real life’, money or measures	
<ul style="list-style-type: none"> 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. 	
<ul style="list-style-type: none"> Explain how a problem was solved. 	
<ul style="list-style-type: none"> Recognise all coins and notes. 	
4.4.2 Understand and use €notation.	e.g. know that €3.06 is €3 and 6c.

Teachers are expected to expose their pupils to investigative work involving solutions to non-routine problems. These activities are essential to enable children to develop problem solving skills and to link together all the strands in the syllabus.

Opportunities should be sought to link mathematics to other subjects by using the Thematic Approach ... this being “*the kind of pedagogical approach that comes closest to the idea of a holistic education, and the methodology (that) should be the dominant feature of our schools.*” (NMC Creating the Future Together” p.78) Mathematics contributes to many subjects of the primary curriculum, such as *Language, Science, Art & Craft, Social Studies and Physical Education*, often in practical ways.

Computer Software available in the classroom should be used to enhance, reinforce and consolidate any learning outcomes related to each of the four strands in this syllabus, namely: Number and Algebra; Measures, Shape and Space; Data Handling; Problem Solving.