

Mathematical Development Area of Learning

During the Foundation Phase, children develop their skills, knowledge and understanding of mathematics through oral, practical and play activities. They enjoy using and applying mathematics in practical tasks, in real-life problems, and within mathematics itself. They use a variety of ICT resources as tools for exploring number, for obtaining real-life data and for presenting their findings.

Much of their work will be oral. They develop their use and understanding of mathematical language in context, through communicating/talking about their work. They ask and respond to questions, and explore alternative ideas. They use appropriate mathematical language to explain their thinking and the methods they use to support the development of their reasoning. They develop a range of flexible methods for working mentally with number, in order to solve problems from a variety of contexts, checking their answers in different ways, moving on to using more formal methods of working and recording when they are developmentally ready. They explore, estimate and solve real-life problems in both the indoor and outdoor environment. They develop their understanding of measures, investigate the properties of shape and develop early ideas of position and movement through practical experiences. They sort, match, sequence and compare objects and events, explore and create simple patterns and relationships, and present their work in a variety of ways.

Mathematical Development



Foundation Phase pedagogy

Children should be given opportunities to develop their skills, knowledge and understanding through:

- a developmentally appropriate curriculum where the seven (six in Welsh-medium settings/schools) Areas of Learning complement each other and work together
- continuous and enhanced provision and focused activities in the indoor and outdoor learning environments
- different types of play and a range of planned activities, including those that are child-initiated
- experiences that allow them to adopt a variety of roles, including leadership within a small group, paired learning or working within a team
- different resources, including ICT
- active learning opportunities that build on prior experiences and support them to become independent thinkers and learners
- activities that allow them to use their senses, be creative and imaginative
- tasks and challenges that encourage problem solving and discussion.

Range of experiences

Children should be given opportunities to:

- experience a mathematically-rich environment that allows them to explore and develop mathematical concepts and language
- develop practical mathematical skills in a range of contexts
- communicate in a range of mathematical contexts for a variety of purposes and audiences
- practise, develop and refine their mathematical skills within all aspects of provision, including continuous provision, and through all Areas of Learning
- experience and use a range of media and stimuli including emerging technologies
- understand and use a range of measures and recognise and use shapes within play and structured activities.

Key

Within the table, text taken from the LNF will appear as normal text. Text that has been extended from the LNF or that is a specific Mathematical Development Area of Learning skill will appear as bold. These skills are further identified by the following icons.

Extended skill ▲ **Area of Learning skill** ❖ When combined with the LNF statements, these skills form the Foundation Phase Mathematical Development Area of Learning.

N.B.

In order to comply with accessibility and legibility, these tables have been designed to be printed at their optimum size of A3.

Mathematical Development



	Nursery	Reception	Year 1	Year 2
Strands	Elements	Children are able to:	Children are able to:	Children are able to:
Developing numerical reasoning	Identifying processes and connections	transfer mathematical skills to play and classroom activities		
		identify steps to complete the task or reach a solution		
		select appropriate mathematics and techniques to use		
		select and use relevant number facts and mental strategies		
		select appropriate equipment and resources		
	Represent and communicate	use knowledge and practical experience to inform estimations		
		use everyday and mathematical language to talk about their own ideas and choices		
		present work orally, pictorially and in written form, and use a variety of ways to represent collected data		
		devise and refine informal, personal methods of recording, moving to using words and symbols in number sentences		
		use checking strategies to decide if answers are reasonable		
	Review	interpret answers within the context of the problem and consider whether answers are sensible		
		interpret information presented in charts and diagrams and draw appropriate conclusions		

Key: Normal text: LNF statement Extended skill Area of Learning skill

Mathematical Development



Strands	Elements	Nursery	Reception	Year 1	Year 2
		Children are able to:	Children are able to:	Children are able to:	Children are able to:
Using number skills	Use number facts and relationships	listen to and join in with rhymes, songs, stories and games that have a mathematical theme ❖	recite a range of number rhymes and songs ❖		
		realise that anything can be counted, not just objects, e.g. claps, steps ❖			
		count reliably up to 5 objects	count reliably up to 10 objects	count reliably up to 20 objects	count sets of objects by grouping in 2s, 5s or 10s
		recite numbers from 0 to 10 forwards and backwards using songs and rhymes ❖	recite numbers up to 20, forwards and backwards, and from different starting points ❖	recite numbers up to 100, forwards and backwards and from different starting points ❖	recite numbers beyond 100, forwards and backwards and from different starting points ❖
		recognise numbers 0 to 5 and relate a number 0 to 5 to its respective quantity	read and write numbers to at least 10	read and write numbers to at least 20 forming and orientating them correctly ▲	read and write numbers to at least 100 ▲
		use mark making to represent numbers in play activities that can be interpreted and explained ❖			
		compare and order numbers to at least 5	compare and order numbers to at least 10	compare and order numbers to at least 20	compare and order 2-digit numbers
		demonstrate an understanding of one-to-one correspondence by matching pairs of objects or pictures	understand that zero means 'none' ❖	demonstrate an understanding of place value, e.g. one 10 and four units equal 14, up to at least 20 ❖	demonstrate an understanding of place value up to at least 100 ❖
			use number facts up to 5 ❖	use number facts within 10, i.e.: – doubling and halving, e.g. 4 + 4 – bonds of 10, e.g. 6 + 4	use mental recall of number facts to 10 to derive other facts, i.e.: – doubling and halving, e.g. derive 40 + 40 from knowing 4 + 4 – bonds of 10, e.g. derive 60 + 40 from knowing 6 + 4

Key: Normal text: LNF statement Extended skill ▲ Area of Learning skill ❖

Mathematical Development



Strands	Elements	Nursery	Reception	Year 1	Year 2
		Children are able to:	Children are able to:	Children are able to:	Children are able to:
Using number skills	Use number facts and relationships			recall doubles and near doubles up to 10 ❖	recall doubles up to 20 ❖
				recognise and understand odd and even numbers up to 20 ❖	recognise and understand odd and even numbers up to 100 ❖
			count in 2s to 10 and in 10s to 100 ❖	count in 2s, 10s and 5s to 100 ❖	count on in 2s, 5s and 10s from any given number ❖
					recall and use 2, 5 and 10 multiplication tables
					begin to link multiplication with simple division, e.g. <i>grouping and sharing in 2s, 5s and 10s</i> ❖
		use the terms 'first', 'second', 'third' and 'last' in daily activities and play ❖	use ordinal numbers to 10 in daily activities and play ❖	use ordinal numbers to 20 in practical situations ❖	use and record ordinal numbers in practical situations ❖
Fractions, decimals, percentages and ratio			begin to read number words ❖	read and write number words to 10 ❖	read and write number words to 100 ❖
				find halves in practical situations	find halves and quarters in practical situations
				recall halves up to 10 ❖	partition 2-digit numbers and know the value of each digit ❖

Key: Normal text: LNF statement Extended skill ▲ Area of Learning skill ❖

Mathematical Development



	Nursery	Reception	Year 1	Year 2
Strands	Children are able to:	Children are able to:	Children are able to:	Children are able to:
Using number skills	understand and use the concept of 'one more' in their play	mentally recall 'one more' of a number within 10 ❖	mentally recall 'one more' of a number within 20 ❖	mentally add 10 or 20 to a given number up to 100 ❖
Calculate using mental and written methods	understand and use the concept of 'one less' in their play	mentally recall 'one less' of a number within 10 ❖	mentally recall 'one less' of a number within 20 ❖	mentally subtract 10 or 20 from a given number up to 100 ❖
		combine two groups of objects to find 'how many altogether?'	use 'counting on' strategies to add two collections, starting with the larger number, e.g. $8 + 5$	find small differences within 20 by using 'counting on' strategies
		take away objects to find 'how many are left?'	add and subtract numbers involving up to 10 objects	use mental recall of number facts to 10 and place value to add or subtract larger numbers, e.g. $24 + 4$, $30 + 5$, $34 + 10$
			use a range of strategies to mentally solve problems within 10 ❖	find a small difference between two numbers by counting on, e.g. $44 - 28 = \square$ ❖
	use counting to solve simple mathematics problems in everyday and play situations ❖	solve simple problems in a practical situation that involve simple addition and subtraction up to 5 ❖	solve one-step problems that involve addition and subtraction, including missing number problems, e.g. $7 + \square = 9$, using concrete objects and pictorial representations ❖	solve one- and two-step problems that involve addition and subtraction, multiplication and simple division including missing number problems, e.g. $40 - \square = 19$ ❖
			use known facts to solve simple problems within 10, e.g. <i>doubling and halving, number bonds</i> ❖	use partitioning strategies to double and halve 2-digit numbers ❖
			use known number facts when adding three single digit numbers and realise addition can be done in any order ❖	understand that multiplication is repeated addition, e.g. $2 + 2 + 2$ is the same as 'three twos' ❖
				add/subtract 9 or 11 from given number by adding/subtracting 10 and adjusting ❖

Key: Normal text: LNF statement Extended skill Area of Learning skill ❖

Mathematical Development



	Nursery		Reception		Year 1	Year 2
Strands	Elements	Children are able to:	Children are able to:	Children are able to:	Children are able to:	Children are able to:
Using number skills	Calculate using mental and written methods		talk about addition and subtraction instructions in play activities ❖	understand and use the mathematical symbols for addition, subtraction and equals ❖	understand and use the different mathematical terms for addition and subtraction, e.g. <i>add, combine, find the difference</i> ❖	understand and use mathematical symbols for addition, subtraction, multiplication, division and equals ❖
	Estimate and check		make a sensible estimate of up to 10 objects that can be checked by counting ❖	make a sensible estimate of a number of objects that can be checked by counting	understand and use the different mathematical terms for addition, subtraction, multiplication, division and equals, e.g. <i>find the total, share, goes into</i> ❖	understand and use the different mathematical terms for addition, subtraction, multiplication, division and equals, e.g. <i>find the total, share, goes into</i> ❖
	Manage money	demonstrate an awareness of the purpose of money through role play	use 1p, 2p, 5p and 10p coins to pay for items	use different combinations of money to pay for items up to 20p	use different combinations of money to pay for items up to £1	use different combinations of money to pay for items up to £1
Using measuring skills	Length, weight/mass, capacity			find totals and give change from 10p		find totals and give change from multiples of 10p
		compare, sort and order two objects in terms of size, weight or capacity by direct observation	use direct comparisons with: – length, height and distance, e.g. <i>longer/shorter than</i> – weight/mass, e.g. <i>heavier/lighter than</i> – capacity, e.g. <i>holds more/less than</i>	use non-standard units to measure: – length, height and distance – weight/mass – capacity	use standard units to measure: – length, height and distance: metres, half metres or centimetres – weight/mass: kilograms or 10 gram weights – capacity: litres	use symbols related to length, weight/mass and capacity ❖

Key: Normal text: LNF statement Extended skill Area of Learning skill ❖

Mathematical Development



Strands	Elements	Nursery	Reception	Year 1	Year 2
		Children are able to:	Children are able to:	Children are able to:	Children are able to:
Using measuring skills	Time	anticipate events related to elements of daily routines and use the terms 'before' and 'after'	use the concept of time in terms of their daily activities	use the concept of time in terms of their daily and weekly activities and the seasons of the year	read hours and minutes on a 12-hour digital clock
		sing/chant the days of the week ❖	sing/chant the days of the week, months and seasons of the year in meaningful contexts, e.g. when changing the class calendar ❖	understand and order the days of the week, the months and seasons of the year in meaningful contexts ❖	record the days of the week, the months and seasons of the year ❖
			demonstrate a developing sense of how long tasks and everyday events take	use standard units of time to read 'o'clock' using both analogue and 12-hour digital clocks	read 'half past', 'quarter past' and 'quarter to' on an analogue clock
		use words that describe temperature during everyday activities, e.g. hot/cold	use direct comparisons when describing temperature, e.g. hot/cold	use descriptive words for a range of temperatures, e.g. cooler/warmer	compare daily temperatures using a thermometer (°C)
		follow two-step instructions for simple movements within games and play activities	move in given directions	make whole turns and half turns	recognise half and quarter turns, clockwise and anti-clockwise
	Area and volume Angle and position				recognise that a quarter turn is a right angle
		demonstrate an awareness of prepositions and movement during their own physical activities ❖	use prepositions to describe position ❖	describe position, direction and movement ❖	use mathematical vocabulary to describe position, direction and movement ❖

Key: Normal text: LNF statement Extended skill Area of Learning skill ❖

Mathematical Development



Strands	Elements	Nursery	Reception	Year 1	Year 2
		Children are able to:	Children are able to:	Children are able to:	Children are able to:
Using geometry skills	Shape	recognise and use the names for 2D shapes (<i>circle, square and triangle</i>) within play activities and the environment ❖	recognise and name common 2D shapes (<i>circle, square, triangle and rectangle</i>) and some 3D shapes (<i>cube, cuboid and sphere</i>) within play activities and the environment ❖	recognise and name common 2D shapes (<i>square, triangle, rectangle, circle and semi-circle</i>) and 3D shapes (<i>cube, cuboid, cone and sphere</i>) in order to begin to compare and sort ❖	recognise and name regular and irregular 2D and 3D shapes, understand and use the properties of shape ❖
		use and build with 2D and 3D shapes within play-based activities ❖	use 2D and 3D shapes to make models and pictures ❖	use 2D and 3D shapes and describe how they fit together ❖	make increasingly more complex or accurate models with 3D shapes and tessellate 2D shapes ❖
	Movement	use a variety of media to develop concept of symmetry ❖	complete a simple symmetrical picture through a variety of media ❖	recognise and complete a symmetrical picture or simple shape ❖	identify a line of symmetry for 2D shapes and complete symmetrical pictures ❖
Using data skills	Collect and record data	sort and match sets of objects by recognising similarities	sort and classify objects using one criterion	sort and classify objects using more than one criterion	sort and classify objects using more than two criterion ❖
	Present and analyse data	use mark making to begin to record collections	record collections using marks, numbers or pictures	collect information by voting or sorting and represent it in pictures, objects or drawings	gather and record data from: – lists and tables – diagrams – block graphs – pictograms where the symbol represents one unit
	Pattern	copy a range of simple patterns and sequences visually and aurally, e.g. <i>clapped patterns, threading activities</i> . ❖	recognise and repeat three object/colour/clapped patterns and sequences. ❖	demonstrate an understanding of repeating patterns, including shape and number, by describing, reproducing and extending. ❖	order and identify patterns in combinations of mathematical objects, including number and number tables, and discuss the relationship between them. ❖

Key: Normal text: LNF statement Extended skill Area of Learning skill ❖

Mathematical Development Outcomes

Foundation Phase Outcome Bronze

Children select countable objects, simple tactile shapes and materials. They keep a very simple clapping pattern.

Foundation Phase Outcome Silver

Children mimic an adult counting and recognise and indicate familiar objects. They fit simple 2D shapes into spaces and can repeat a very simple clapping pattern. They listen to familiar number rhymes, songs and stories and say or indicate at least one number. They explore the distinctions between two objects.

Foundation Phase Outcome Gold

Children count or indicate two objects with support and associate 1 and 2 with number activities. They may explore tactile number shapes and ask for 'more' in relation to personal wants. They explore 2D shapes and 3D objects in play and can copy a simple auditory pattern. They listen to familiar number rhymes, songs and stories and say or indicate more than one number. They anticipate a routine event from an adult action. They start to understand the language of size and can find the 'big' object. They can find coins from a limited collection and find and retrieve an object when prompted by an adult. They imitate simple movements when modelled.

Foundation Phase Outcome 1

With support, children recite or indicate numbers 1 to 3. They use one-to-one correspondences to count or indicate up to three objects and recognise numbers 0 to 3 and begin to make marks to represent numbers. They recognise 'more' and 'less' in their play. They use everyday language to compare sizes of objects and describe temperature and explore regular 2D and 3D shape in play. They begin to show recognition of pattern in environment. They use everyday language to compare sizes of objects and find similar coins when prompted by an adult. They understand simple time-related vocabulary. They find similar objects when prompted by an adult. They follow one-step instructions for simple movements.

Foundation Phase Outcome 2

Children recite up to 10 forwards and backwards using songs and rhymes and they recognise, compare and order numbers up to 5. They use one-to-one correspondence to count up to five objects and make marks to represent numbers in their play and to record collections. They can understand and use the concept of 'one more' and 'one less' in their play and are beginning to make a sensible estimates of up to five objects. They compare, sort and order two objects by direct observation and use words that describe temperature during everyday activities. They anticipate events related to elements of the day and begin to use simple time-related words. They recognise and name simple 2D shapes, and use 2D and 3D shapes and show an awareness of money in their play. They copy a range of simple patterns visually and aurally and sort and match objects and pictures by recognising similarities. They follow two-step instructions for simple movements.

Foundation Phase Outcome 3

Children recite up to 20 and in simple sequences and count up to 10 objects reliably. They read, write and compare and order numbers to 10 and understand that zero means none. They understand very simple addition and subtraction and mentally recall 'one more' and 'one less' within 10. They use 1p, 2p, 5p and 10p coins to 'pay' for items. They make a sensible estimate up to 10 and understand that this can be checked by counting. They use direct comparisons and simple terminology in terms of measure and temperature and understand that measurements must start at the same point. They use the concept of time in terms of daily events and demonstrate a sense of how long things take. They recognise simple 2D and 3D shapes, describe them in simple language and use them in their play. They recognise and repeat patterns of up to three visually and aurally. They sort and classify objects using one criterion and record collections using marks, numbers or pictures. They move in given directions.

Foundation Phase Outcome 4

Children recite numbers in simple sequences to 100, including different starting points and compare and order numbers to 20. They count up to 20 objects, sometimes using small groups. They read and write numbers to 20. They understand and describe how to partition numbers below 20 into tens and units. They recall halves and doubles up to 10 and recognise and understand odd and even numbers up to 20. They can perform simple addition and subtraction using their preferred strategy and mentally recall 'one more' and 'one less' of a number within 20. They make sensible estimates of larger groups of objects, and use estimation and checking with calculations and measurements. They 'pay' for items up to 20p and find totals and give change from 10p. They use non-standard units when measuring and use descriptive words when describing temperature. They use the concept of time in daily and weekly activities and use standard units of time to read hours on a clock. They find halves in practical situations and recognise and name common regular 2D and 3D shapes and describe and experiment with how they fit together in their play. They copy, describe and extend patterns including shape and number. They can sort or match more than one criterion. They collect information by voting or sorting and represent the total in pictures, objects or lists and tables. They make whole and half turns.

Foundation Phase Outcome 5

Children recite in simple sequences beyond 100, including different starting points and compare and order two-digit numbers. They count larger sets of objects reliably using grouping. They read and write numbers to 100 and understand and explain the position of the digit determines the value up to 100. They partition two-digit numbers and know the value of each digit. They recall doubles up to 20 and recognise and understand odd and even numbers up to 100. They can perform more difficult additions and subtractions using their preferred strategy and mentally recall '10 more' or '20 more' within 100. They 'pay' for items up to £1 and find totals and give change from multiples of 10p. They begin to understand the link between multiplication and division, and use 2, 5 and 10 multiplication tables to solve problems. They use a variety of estimation and checking strategies that are appropriate to calculations and measurements. They use standard units to measure and show an awareness of different scales of units and compare daily temperatures using a thermometer. They use standard units of time to read hours and minutes on a clock. They find halves and quarters in practical situations. They recognise, name and describe the properties of regular and irregular 2D and 3D shapes, and use them in increasingly more complex or accurate ways in their play. They order and identify patterns in mathematical objects and discuss them. They sort and classify using more than two criteria and gather and record data from a range of sources, and recognise half and quarter turns and that a quarter turn is a right angle.

Foundation Phase Outcome 6

Children recite in less predictable sequences to 1 000, including different starting points. They read and write numbers to 1 000 and understand and explain that the position of the digit determines the value up to 1 000 and make approximations based upon place value. They count large sets of objects using a range of strategies. They perform more difficult additions and subtractions using their preferred strategy including mental strategies. They use 2, 3, 4, 5 and 10 multiplication tables to solve multiplication and division problems, and begin to understand remainders. They use finer estimations and checking strategies including inverse addition/subtraction and halving/doubling, understand some large and small units in relation to each other and use negative number in the context of temperature. They 'pay' for items up to £2 and calculate change. They can order and compare items up to £10. They use standard units of time to read hours and minutes on a clock and can calculate simply everyday durations. They find halves and quarters in practical situations, recall number halves and recognise simple joining of fractions. They recognise and classify regular and irregular 2D and 3D shapes. They explore and extend number patterns including addition and subtraction. They sort and classify using more than two criteria, explain their reasoning in mathematical language and use sorting diagrams. They represent data using more complex methods, and extract and interpret information from data representations. They relate right angles to full, half and quarter turns.

