

Re-presented Content Objectives Cards: Mathematics

Third Class - Sixth Class

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Re-presented Content Objectives: Mathematics is designed to give an overview of the content objectives in each strand and strand unit for Mathematics from Third Class to Sixth Class. It is not intended to replace the curriculum documents. It is still important that teachers would consult the curriculum when planning.

The child should be enabled to

	Third Class	Fourth Class	Fifth Class	Sixth Class
Place value	<p>2.4.3 explore and identify place value in whole numbers 0–999</p> <p><i>grouping and swapping activities involving units, tens, hundreds using concrete materials, e.g. lollipop sticks, abacus, notation boards, base ten materials, money</i></p> <p><i>significance of zero: 208, 420</i></p>	<p>2.4.7 explore and identify place value in whole numbers 0–9999</p> <p><i>grouping and swapping activities involving units, tens, hundreds and thousands using concrete materials and notation boards</i></p> <p><i>significance of zero: 1078, 2005, 3620</i></p>		
	<p>2.4.4 read, write and order three-digit numbers</p> <p><i>identify and record numbers represented by money and abacus</i></p> <p><i>identify and express numbers in expanded form</i> 246 = 2 hundreds + 4 tens + 6 units</p> <p><i>order numbers on the number line or hundred square</i></p> <p><i>247: what is the value of 4 in this number?</i></p> <p><i>which digit has the greatest value?</i></p> <p><i>what is the next number after 499?</i></p>	<p>2.4.8 read, write and order four-digit numbers and solve simple problems</p> <p><i>write 5683 in expanded form</i> 5000 + 600 + 80 + 3</p> <p><i>what is the value of the underlined 7 in 7<u>7</u>77?</i></p> <p><i>make as many numbers as you can from 3, 7, 0, 6 place in order, starting with the largest</i></p>	2.4.11 read, write and order whole numbers and decimals	<p><i>extend previous conceptual and practical work to include larger numbers and decimals</i></p>

Place value	<p>2.4.5 round whole numbers to the nearest ten or hundred</p> <p><i>which number is nearer to 40: 29 or 79? which number is nearer to 500: 432 or 567?</i></p>	<p>2.4.9 round whole numbers to the nearest thousand</p> <p><i>which number is nearer to 5000: 4328 or 5675?</i></p>	<p>2.4.12 round whole numbers and round decimals</p> <p><i>round whole numbers to nearest ten, hundred, thousand round decimals to nearest whole number</i></p>	<p>2.4.14 round decimals</p> <p><i>round decimals to one, two or three decimal places</i></p>
	<p>2.4.6 explore and identify place value in decimal numbers to one place of decimals</p>	<p>2.4.10 explore and identify place value in decimal numbers to two places of decimals</p>	<p>2.4.13 identify place value in whole numbers and decimals</p> <p><i>extend previous conceptual and practical work to include larger numbers and decimals</i></p>	

The child should be enabled to

		Third Class	Fourth Class	Fifth Class	Sixth Class		
Addition and Subtraction	2.5.16	add and subtract, without and with renaming, within 999 <i>estimate sums and differences (rounding where necessary) check estimates record using horizontal and vertical presentation</i>	2.5.28	add and subtract, without and with renaming, within 9999 <i>estimate sums and differences check estimates without and with a calculator</i>	2.5.35	estimate sums, differences, products and quotients of whole numbers <i>use strategies for estimation, e.g. front-end estimation, rounding, clustering, special numbers estimate calculations and compute answers with a calculator e.g. $450 \times 9 = 4500$ (estimation based on 450×10) estimate first, then use calculator to get actual result</i>	<i>use strategies for estimation estimate calculations and compute answers with a calculator</i>
		2.5.17 know and recall addition and subtraction facts					
	2.5.18	solve word problems involving addition and subtraction <i>use a calculator to develop problem-solving strategies and verify estimations</i>		2.5.36	add and subtract whole numbers and decimals (to three decimal places) without and with a calculator <i>develop and extend the use of existing algorithms</i>		

The child should be enabled to

		Third Class	Fourth Class	Fifth Class	Sixth Class
Multiplication	2.5.19	<p>develop an understanding of multiplication as repeated addition and vice versa</p> <p><i>count sets of objects in twos, threes, fours etc. to tens</i></p> <p><i>count in steps on the number line or hundred square</i></p> <p><i>construct number sentences with concrete materials and record diagrammatically</i></p> <p><i>** ** * = *****</i></p> <p>$2 + 2 + 2 = 6$</p> <p>$3 \times 2 = 6$</p> <p><i>record number sentences as $6 + 6 + 6 - 3 \times 6 - 18$</i></p>			
	2.5.20	<p>explore, understand and apply the zero, commutative and distributive properties of multiplication</p> <p><i>use concrete materials, charts and illustrations to establish and record:</i></p> <p><i>zero property, e.g. $5 \times 0 = 0$ and $0 \times 7 = 0$</i></p> <p><i>commutative property, e.g. $3 \times 4 = 4 \times 3$</i></p> <p><i>distributive property, e.g. $5 \times 4 = (3 \times 4) + (2 \times 4)$</i></p>	<p>2.5.29 explore, understand and apply the zero, commutative, distributive and associative properties of multiplication</p> <p><i>use concrete materials and charts to establish associative property, e.g. $(3 \times 4) \times 5 = 3 \times (4 \times 5)$</i></p>		

<p>2.5.21 develop and/or recall multiplication facts within 100</p> <p><i>counting in 2, 3, 5 and 10 doubles, trebles</i> $2 \times 9 = 18$, $4 \times 9 = 36$, $8 \times 9 = 72$ $3 \times 4 = 12$, $9 \times 4 = 36$</p>	<p>2.5.30 develop and recall multiplication facts within 100</p>		
<p>2.5.22 multiply a one-digit or two-digit number by 0-10</p> <p><i>use rounding to estimate products</i> <i>rounding up/down, e.g. 6×28 is near to 6×30</i> <i>represent in horizontal and vertical form</i> 23×7 and 23×7 <i>establish effect of multiplication by 1 and by 10</i> $1317 = 17$, $10353 = 530$</p>	<p>2.5.31 multiply a two-digit or three-digit number by a one or two-digit number</p> <p><i>estimate products</i> <i>represent multiplication in expanded form</i> $26 \times 37 = (20 \times 37) + (6 \times 37)$ <i>record and calculate using long multiplication algorithm</i> 37 $26X$ 222 (37×6) 740 (37×20) <i>total: 962</i></p>	<p>2.5.37 multiply a decimal (up to three places) by a whole number, without and with a calculator</p> <p><i>develop and extend the use of existing algorithms</i> 8.125×9</p>	<p>2.5.40 multiply a decimal by a decimal, without and with a calculator</p> <p><i>develop and extend the use of existing algorithms</i> 7.25×1.5; 13.2×0.75 <i>understand that multiplication does not always make larger</i></p>
	<p>2.5.32 use a calculator to check estimates</p>		
<p>2.5.23 solve and complete practical tasks and problems involving multiplication of whole numbers</p> <p><i>how many days in 9 full weeks?</i></p>	<p><i>34 children buy one packet of sweets per child each day</i> <i>how many packets altogether do they buy in a month?</i></p>		

The child should be enabled to

	Third Class	Fourth Class	Fifth Class	Sixth Class
Division	2.5.24 develop an understanding of division as sharing and as repeated subtraction, without and with remainders <i>share a quantity in equal groups of 2, 3, ...</i> <i>record using number sentences or vertically</i> $20 - 4 - 4 - 4 - 4 = 0$			
	2.5.25 develop and/or recall division facts within 100 <i>use inverse of multiplication facts</i> <i>use halves</i> <i>9 is half of 18 ($2 \times 9 = 18$)</i>			
	2.5.26 divide a one-digit or two-digit number by a one-digit number without and with remainders <i>represent division as repeated subtraction</i> <i>represent division as number sentences</i> <i>record using the division algorithm</i> <i>use different strategies to estimate quotients and check answers</i> <i>rounding up or down, e.g.</i> <i>44 divided by 12 is about 40</i> <i>divided by 10</i>	2.5.33 divide a three-digit number by a one-digit number without and with remainders <i>using regrouping</i> <i>using algorithm</i> <i>explore, understand and apply the distributive property of division</i>	2.5.38 divide a three-digit number by a two-digit number, without and with a calculator <i>explore the concept of division with concrete materials</i> <i>develop the long division algorithm from repeated subtraction and multiples of repeated subtraction</i>	2.5.41 divide a four-digit number by a two-digit number, without and with a calculator <i>develop and extend the use of existing algorithms</i> <i>7852 divided by 26</i>

Division		<p>2.5.34 use calculator to check estimates</p> <p><i>using compatible numbers (i.e. numbers easily worked with an extension of basic facts)</i></p> <p><i>338 divided by 7 is compatible with 350 divided by 7</i></p>		
	<p>2.5.27 solve and complete practical tasks and problems involving division of whole numbers</p> <p><i>problems based on the environment</i></p> <p>how many cars are needed to take 27 children to a game if only 4 children are allowed in each car? estimate, discuss and record</p>	<p><i>how many small boxes of eggs (6 per box) can be filled from a crate containing 350 eggs?</i></p> <p><i>estimate, discuss and record</i></p>		
			<p>2.5.39 divide a decimal number by a whole number, without and with a calculator</p> <p><i>explore the concept of division of decimals with concrete materials, money and measurement</i></p> <p><i>extend the algorithm in conjunction with place value</i></p> <p><i>75.6 divided by 4</i></p>	<p>2.5.42 divide a decimal number by a decimal, without and with a calculator</p> <p><i>explore the concept of division by decimals with concrete materials, money and measurement</i></p> <p><i>36.92 divided by 2.6; 27.6 divided by 0.2</i></p> <p><i>understand that division does not always make smaller</i></p>

The child should be enabled to

		Third Class	Fourth Class	Fifth Class	Sixth Class
Fractions	2.6.3	identify fractions and equivalent forms of fractions with denominators 2, 4, 8 and 10 <i>construct and cut out simple fractions of regular shapes record using diagrams or fraction charts</i>	2.6.9 identify fractions and equivalent forms of fractions with denominators 2, 3, 4, 5, 6, 8, 9, 10 and 12 <i>construct and cut out simple fractions of regular shapes record using diagrams or fraction charts</i>		
	2.6.4	compare and order fractions with appropriate denominators and position on the number line		2.6.12 compare and order fractions and identify equivalent forms of fractions with denominators 2 - 12 <i>explore, compare and record simple equivalence using concrete materials, paper folding, and fraction charts</i>	2.6.17 compare and order fractions and identify equivalent forms of fractions <i>order equivalent fractions on the number line and on fraction charts</i>
		2.6.5 calculate a fraction of a set using concrete materials			
	2.6.6	develop an understanding of the relationship between fractions and division			
	2.6.7	calculate a unit fraction of a number and calculate a number, given a unit fraction of the number	2.6.10 calculate a number, given a multiple fraction of the number		
			2.6.11 express one number as a fraction of another number	2.5.13 express improper fractions as mixed numbers and vice versa and position them on the number line	

Fractions			<i>establish equivalence by using concrete materials</i> <i>explore, compare and record simple improper fractions and mixed numbers diagrammatically, numerically and on the number line</i>	
	2.6.8 solve and complete practical tasks and problems involving fractions			
	<i>what fraction of a chart is coloured yellow/is not green?</i>			
			2.6.14 add and subtract simple fractions and simple mixed numbers	
			<i>use equivalent fractions to simplify calculations</i>	<i>common denominator should be found by listing multiples</i>
		2.6.15 multiply a fraction by a whole number	2.6.18 multiply a fraction by a fraction	
		<i>develop concepts with concrete materials, paper folding and fraction charts</i> <i>four x three quarters of a pizza is how many pizzas?</i>	<i>explore and develop concept by using concrete materials and the number line and by drawing diagrams to illustrate examples, leading to the development of an algorithm</i>	
		2.6.16 express tenths, hundredths and thousandths in both fractional and decimal form		
		<i>explore and compare using concrete materials</i> <i>express as fractions and as decimals</i>		

Fractions				<p>2.6.19 divide a whole number by a unit fraction</p> <p><i>how many quarters in 2? 2 divided by one quarter 4 ; 15 divided by one fifth 5</i></p>
				<p>2.6.20 understand and use simple ratios</p> <p><i>explore and record the relationship between the natural numbers and their multiples</i></p>

The child should be enabled to

	Third Class	Fourth Class	Fifth Class	Sixth Class
Decimals and percentages	2.7.1 identify tenths and express in decimal form express one tenth as 0.1 <i>cut out tenths and/or 0.1 of regular shapes record using diagrams or charts</i>	2.7.4 express tenths and hundredths as fractions and decimals	2.7.8 develop an understanding of simple percentages and relate them to fractions and decimals <i>express percentages as fractions and as decimals, and vice versa calculate simple percentages, e.g. 50%, 25% 10%</i>	2.7.11 use percentages and relate them to fractions and decimals <i>express quantities as percentages</i>
		2.7.5 identify place value of whole numbers and decimals to two places and write in expanded form <i>3.45 = 3 + 0.4 + 0.05</i>		
	2.7.2 order decimals on the number line <i>draw a circle around the number with the greatest value: 0.5, 0.1, 0.7, 0.2</i>	<i>identify the number with the greatest value: 0.57, 0.01, 0.72, 0.25</i>	2.7.9 compare and order fractions and decimals <i>explore, compare and record using concrete materials and money order diagrammatically or on the number line</i>	2.7.12 compare and order percentages of numbers
		2.7.6 add and subtract whole numbers and decimals up to two places		
		2.7.7 multiply and divide a decimal number up to two places by a single-digit whole number		

Decimals and percentages	2.7.3 solve problems involving decimals	2.7.10 solve problems involving operations with whole numbers, fractions, decimals and simple percentages <i>use diagrams; estimate and compute answers with a calculator, include simple discount and increase examples 10% off all jeans, 20%extra free</i>	2.7.13 solve problems relating to profit and loss, discount, VAT, interest, increases, decreases
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The child should be enabled to

	Third Class	Fourth Class	Fifth Class	Sixth Class
Number theory			<p>2.8.1 identify simple prime and composite numbers</p> <p><i>define a prime number, i.e. a number greater than 1 with exactly two divisors, itself and 1</i></p> <p><i>identify simple prime numbers by trial and error, e.g. 2, 5, 7, 11</i></p> <p><i>identify and record primes with Sieve of Eratosthenes</i></p> <p><i>define a composite number, i.e. a number that has more than two divisors, e.g. 4, 6, 9</i></p> <p><i>identify and record composite numbers using number facts and/or a calculator</i></p> <p><i>investigate relationship with odd and even numbers</i></p>	
			<p>2.8.2 identify square and rectangular numbers</p> <p><i>construct diagrams on geoboards, pegboards and squared paper to illustrate simple square and rectangular numbers</i></p> <p><i>explore, compare and record these numbers</i></p>	<p>2.8.4 identify and explore square numbers</p> <p><i>$16 = 4 \times 4 = 4$ to the power of 2</i></p>

Number theory			2.8.5 explore and identify simple square roots <i>construct diagrams</i> <i>record and relate to square numbers</i>
		2.8.3 identify factors and multiples <i>identify factors and multiples from basic multiplication facts</i>	2.8.6 identify common factors and multiples <i>explore and record factors and multiples to identify common factors and multiples</i>
			2.8.7 write whole numbers in exponential form <i>1000 = 10 x 10 x 10 = 10 to the power of 3</i> <i>8 = 2 x 2 x 2 = 2 to the power of 3</i>

The child should be enabled to

	Third Class	Fourth Class	Fifth Class	Sixth Class
Number patterns and sequences	<p>3.2.1 explore, recognise and record patterns in number, 0-999</p> <p><i>group and count in twos, threes, fours ... tens on number line and hundred square</i></p> <p><i>recognise number bonds through grouping</i></p> <p><i>17 + 3, 27 + 3, 37 + 3</i></p> <p><i>recognise links within and between multiplication tables (e.g. links between 4 and 8 times tables)</i></p> <p><i>patterns of odd and even numbers</i></p>	<p>3.2.4 explore, recognise and record patterns in number, 0-9999</p>		
	<p>3.2.2 explore, extend and describe (explain rule for) sequences</p> <p><i>patterns or sequences of objects or shapes</i></p> <p><i>whole-number sequences (e.g. 54, 44, 34, or 1, 3, 9, 27)</i></p>	<p>3.2.5 explore, extend and describe sequences</p>		
	<p>3.2.3 use patterns as an aid in the memorisation of number facts</p> <p><i>make patterns on the hundred square</i></p>			

The child should be enabled to

	Third Class	Fourth Class	Fifth Class	Sixth Class
Number sentences	3.3.1 translate an addition or subtraction number sentence with a frame into a word problem (frame not in initial position) $3 + 7 = \underline{\quad}$ <i>Mary has three sweets, she gets seven more, how many has she now?</i>	3.3.3 translate an addition, subtraction, multiplication or division number sentence with a frame into a word problem (frame not in initial position)		
		3.3.4 translate a one-step word problem into a number sentence <i>Rita has 18 toy cars She wants to arrange them in 3 rows $18 = 3 \times \underline{\quad}$</i>		
	3.3.2 solve one-step number sentences			
	$400 - \underline{\quad} = 350$ $810 + 23 = \underline{\quad}$	<i>discuss and record solutions for open number sentences $3 + \underline{\quad} < 7$ or $5 + \underline{\quad} > 8$</i>		

The child should be enabled to

Directed numbers	Third Class	Fourth Class	Fifth Class	Sixth Class
			<p>3.4.1 identify positive and negative numbers in context</p> <p><i>examine and discuss money affairs, video counters and calculator displays, sports reports, golf scores, temperature, sea level and lifts, leading to the need to distinguish between amounts above and below zero</i></p> <p><i>refer to positive and negative numbers as 'positive seven' and 'negative three' record positive and negative numbers with + or - signs raised e.g. + 7, - 3</i></p> <p><i>rewind a video tape</i></p> <p><i>pupils draw and label a thermometer, mark in temperatures, consult weather forecasts in newspapers</i></p>	<p>3.4.2 identify positive and negative numbers on the number line</p> <p><i>walk the number line to experience positive and negative numbers that arise in discussion and/or in context, identify and mark positive and negative numbers on personal and class number lines</i></p>

3.4.3 add simple positive and negative numbers on the number line

add simple positive and negative numbers by walking the number line and by counting on the class and personal number line

$$+5 + -7 = ? \quad 9 + -3 = ?$$

$$-8 + +2 =$$

add positive and negative numbers that arise contextually, e.g. a golfer's score over four rounds was 6 under par, 2 over par, 3 under par, and 1 under par; what was her final score relative to par?

The child should be enabled to

Rules and properties	Third Class	Fourth Class	Fifth Class	Sixth Class
			<p>3.5.1 explore and discuss simple properties and rules about brackets and priority of operation</p> <p><i>identify, discuss and compute expressions with brackets in a variety of positions</i></p> <p>$10 + (4 + 7) = _$ $(10 + 4) + 7 = _$ $(8 - 1) + 4 = _$ $8 - (1 + 4) = _$ $(3 \times 4) + 5 = _$ $3 \times (4 + 5) = _$ $8 \text{ divided by } (2 + 2) = _$ $(8 \text{ divided by } 2) + 2 = _$</p> <p><i>what is the significance of the positions of the brackets?</i></p> <p><i>identify, discuss and compute expressions with brackets excluded</i></p> <p>$4 + 3 \times 5 = _$ $12 \times 6 + 3 = _$ $2.45 \text{ divided by } 5 - 0.75 = _$ $96 \text{ divided by } 8 - 12 = _$</p> <p><i>what is the significance of starting operations at different points?</i> <i>e.g. $4 + 3$ before 3×5 or vice versa in $4 + 3 \times 5$</i></p> <p><i>establish the value of brackets, leading to the priority of multiplication and division over addition and subtraction</i></p> <p><i>explore these properties and rules without and with a calculator</i></p>	<p>3.5.3 know simple properties and rules about brackets and priority of operation</p> <p><i>use the calculator in exercises to find missing numerals and missing operator</i> <i>e.g. $37 ? 21 ? 23 = 800$</i> <i>$27 ? (36 ? 11) = 675$</i></p>

Rules and properties			<p>3.5.2 identify relationships and record verbal and simple symbolic rules for number patterns</p> <p><i>identify and discuss rules for simple number sequences</i> <i>2.0, 3.5, 5.0, 6.5 ... i.e.</i> <i>sequence increases by adding 1.5</i> <i>81, 27, 9 ... decreases by dividing by 3</i> <i>1, 4, 9, 16, 25, 36 ...</i></p>	<p>3.5.4 identify relationships and record symbolic rules for number patterns</p> <p><i>deduce and record rules for given number patterns</i> <i>2, 6, 12, 20, 30 ...</i> <i>4:1, 8:2, 16:4 ...</i></p>

The child should be enabled to

	Third Class	Fourth Class	Fifth Class	Sixth Class
Variables				<p>3.6.1 explore the concept of a variable in the context of simple patterns, tables and simple formulae and substitute values for variables</p> <p><i>identify and discuss simple formulae from other strands e.g. $d = 2 \times r$; $a = l \times w$ substitute values into formulae and into symbolic rules developed from number patterns</i></p>

The child should be enabled to

	Third Class	Fourth Class	Fifth Class	Sixth Class
Equations			<p>3.7.1 translate number sentences with a frame into word problems and vice versa</p> <p><i>create number stories to describe a given number sentence</i></p> <p><i>how many teams of four can the teacher make for relays from a class of twenty-eight children?</i></p> <p>$28 / 4 = _$</p> <p><i>a man has twenty-eight windows to clean; it takes him an hour to clean four; how long will it take him altogether?</i></p> <p><i>construct number sentences to describe mathematically a given word problem</i></p>	<p>3.7.3 translate word problems with a variable into number sentences</p> <p><i>Peter cut a length of ribbon into five equal parts; each part was 30 cm long. How long was the ribbon before it was cut?</i></p> <p>$x / 5 = 30$</p>
			<p>3.7.2 solve one-step number sentences and equations</p> <p>$75 - 43 = _$ $3.5 \times _ = 14$</p> <p>$25\% \text{ of } _ = 15$</p>	<p>$-3 + +6 = _$</p> <p>$-4 + _ = +1$</p> <p>$10 \times _ = 8 \times 5$</p>

The child should be enabled to

		Third Class	Fourth Class	Fifth Class	Sixth Class	
3-D Shapes	4.2.9	identify, describe and classify 3-D shapes, including, cube, cuboid, cylinder, cone, sphere, triangular prism, pyramid		4.2.15	identify and examine 3-D shapes and explore relationships, including tetrahedron (faces, edges and vertices)	
	4.2.10	explore, describe and compare the properties of 3-D shapes <i>number and shape of faces, number of edges and corners, ability to roll, slide or stack</i>	4.2.14	establish and appreciate that when prisms are sliced through (in the same direction) each face is equal in shape and size <i>keep work exploratory and simple e.g. use Plasticine, triangular prisms or suitable foods</i>	4.2.17	identify and examine 3-D shapes and explore relationships, including octahedron (faces, edges and vertices)
	4.2.11	explore and describe the relationship of 3-D shapes with constituent 2-D shapes <i>identify constituent 2-D shapes by observation and deconstruction and compile a table of results</i>				
	4.2.12	construct 3-D shapes <i>trace around nets and cut out; use straws or pipe cleaners</i>				
	4.2.13	solve and complete practical tasks and problems involving 2-D and 3-D shapes. <i>identify the use of 3-D shapes in the environment</i>				
				4.2.16	draw the nets of simple 3-D shapes and construct the shapes <i>discuss and draw simple net including flaps where necessary construct 3-D shapes from nets</i>	

The child should be enabled to

		Third Class	Fourth Class	Fifth Class	Sixth Class	
2-D Shapes	4.3.14	identify, describe and classify 2-D shapes: square, rectangle, triangle, hexagon, circle, semicircle, oval and irregular shapes	4.3.20	identify, describe and classify 2-D shapes: equilateral, isosceles and scalene triangle, parallelogram, rhombus, pentagon, octagon	4.3.21	make informal deductions about 2-D shapes and their properties
	4.3.15	explore, describe and compare the properties (sides, angles, parallel and non-parallel lines) of 2-D shapes		4.3.22	use angle and line properties to classify and describe triangles and quadrilaterals <i>name, explore and compare a wide variety of three and four-sided figures in terms of size and number of angles, type and number of sides e.g. trapezium, scalene triangle, regular hexagon</i>	
	4.3.16	construct and draw 2-D shapes <i>use templates, stencils, geostrips, geoboards</i>	<i>use ruler and set square</i>		4.3.28	construct triangles from given sides or angles <i>complete the construction of triangles, given two sides and the angle between them or given two angles and the line between them</i>
					4.3.23	identify the properties of the circle <i>explore and compare circles of various unit diameters measure and identify the relationship of diameter to radius examine area by counting square units</i> <i>relate the diameter of a circle to its circumference by measurement measure the circumference of a circle or object such as a rolling-pin or wheel e.g. use a piece of string</i>

		4.3.24 construct a circle of given radius or diameter <i>draw using a compass</i>	
4.3.17 combine, tessellate and make patterns with 2-D shapes <i>cover surfaces with 2-D shapes that tessellate or do not tessellate identify properties that facilitate or hinder tessellation combine shapes to make patterns</i>	<i>combine shapes to make patterns and to make other shapes create a tessellating pattern on squared paper</i>	4.3.25 tessellate combinations of 2-D shapes	
4.3.18 identify the use of 2-D shapes in the environment <i>buildings, road signs, printing, household objects</i>	<i>hoardings, shop fronts, paving-stones</i>	4.3.26 classify 2-D shapes according to their lines of symmetry <i>explore, compare and record lines of symmetry in 2-D shapes</i>	
			4.3.29 plot simple co-ordinates and apply where appropriate <i>use geoboards and squared paper</i>
4.3.19 solve and complete practical tasks and problems involving 2-D shapes		4.3.27 use 2-D shapes and properties to solve problems <i>make a specified shape with Tangram shapes</i>	

The child should be enabled to

	Third Class	Fourth Class	Fifth Class	Sixth Class
Symmetry	4.4.2 identify line symmetry in the environment			
	4.4.3 identify and draw lines of symmetry in two dimensional shapes <i>fold paper shapes or use a mirror to identify lines of symmetry use fold lines to draw and record lines of symmetry classify 2-D shapes according to their number of lines of symmetry</i>	4.4.4 identify lines of symmetry as horizontal, vertical or diagonal <i>using examples from the environment, e.g. an open book, windows, gates</i>		
		4.4.5 use understanding of line symmetry to complete missing half of a shape, picture or pattern <i>in drawings, on geoboard or pegboard where the fold is vertical, horizontal or diagonal</i>		

The child should be enabled to

	Third Class	Fourth Class	Fifth Class	Sixth Class
Lines and angles	<p>4.5.2 identify, describe and classify vertical, horizontal and parallel lines</p> <p><i>discuss and describe lines in the environment draw and label lines use geostrips to construct vertical and horizontal lines</i></p>	<p>4.5.6 identify, describe and classify oblique and perpendicular lines</p> <p><i>use straws to construct oblique and perpendicular lines and diagonals in a square</i></p>	<p>4.5.8 recognise, classify and describe angles and relate angles to shape and the environment</p> <p><i>explore and compare a wide variety of angles and shapes measure and record angles as acute, obtuse, reflex or right angles, and determine the number of such angles in relation to common regular shapes</i></p>	<p>4.5.12 recognise, classify and describe angles and relate angles to shape</p> <p><i>identify types of angles in the environment</i></p>
	<p>4.5.3 recognise an angle in terms of a rotation</p> <p><i>form angles by opening books and doors, by rotating clock hands and geostrip arms, by physically turning (clockwise/anti-clockwise), or on computer</i></p>	<p>4.5.7 draw, discuss and describe intersecting lines and their angles</p> <p><i>perpendicular and oblique lines, acute, obtuse and right angles</i></p>	<p>4.5.9 recognise angles in terms of a rotation</p> <p><i>examine, measure and record the angles (including the reflex angle) formed by the hands of a clock at a variety of different times extend by using manipulatives, e.g. straws, lollipop sticks, Meccano, string, 360° protractor, LOGO computer language if available</i></p>	
	<p>4.5.4 classify angles as greater than, less than or equal to a right angle</p>	<p>4.5.10 estimate, measure and construct angles in degrees</p>		

<p><i>construct and use a right-angle measure to identify right angles in the environment and in 2-D and 3-D shapes</i> <i>classify and record angles as $>$, $<$ or $=$ to a right angle</i></p>		<p><i>measure and record a wide variety of angles using a protractor</i> <i>construct angles of various sizes using a protractor</i> <i>estimate angle sizes and check by measuring with a protractor</i></p>	
	<p>4.5.5 solve problems involving lines and angles</p>	<p>4.5.11 explore the sum of the angles in a triangle</p> <p><i>cut off the three corners of a paper triangle and put them together to make 180 degrees</i> <i>measure the angles in a variety of triangles using a protractor</i> <i>calculate and record their sum</i> <i>examine and discuss results</i></p>	<p>4.5.13 explore the sum of the angles in a quadrilateral</p> <p><i>cut off the four corners of a paper quadrilateral and put them together to make 360 degrees</i> <i>measure the angles in a variety of quadrilaterals and calculate their sums</i></p>

The child should be enabled to

	Third Class	Fourth Class	Fifth Class	Sixth Class
Length	<p>5.1.9 estimate, compare, measure and record lengths of a wide variety of objects using appropriate metric units (m, cm)</p> <p><i>everyday objects, furniture, heights of children estimate length and height without and with unit of measurement present measure to check estimates</i></p>	<p>5.1.12 estimate, compare, measure and record lengths of a wide variety of objects, using appropriate metric units, and selecting suitable instruments of measurement</p> <p><i>lengths and heights of doors, corridors, school yard, paths, drives, playing-fields instruments: rulers, tape measures, trundle wheel</i></p>	<p>5.1.16 select and use appropriate instruments of measurement</p> <p><i>ruler for shorter objects metre stick for longer objects or distances trundle wheel for distances</i></p>	
	<p>5.1.10 rename units of length in m and cm</p> <p><i>125 cm = 1 m 25 cm</i></p>	<p>5.1.13 rename units of length using decimal or fraction form</p> <p><i>25 cm = 0.25 m = quarter m 2 km 150 m = 2150 m = 2.15 km</i></p>	<p>5.1.17 estimate and measure length using appropriate metric units</p> <p><i>estimate and measure a large variety of objects and places, both outdoors and indoors: books, desks, corridors, driveways, playing-pitch sidelines how far can you throw a ball? jump? run in 20 seconds? use appropriate measuring units mm (shorter objects) cm (longer objects) m (short distances) km (long distances)</i></p>	<p>5.1.19 rename measures of length</p> <p><i>rename measurements of appropriate metric units; express results as fractions and decimal fractions of appropriate metric units 233 m = 0.233 km 1 m 11 cm = 1.11 m</i></p>

Length		5.1.14 understand, estimate and measure the perimeter of regular 2-D shapes	5.1.18 estimate and measure the perimeter of regular and irregular shapes	
	5.1.11 solve and complete practical tasks and problems involving the addition and subtraction of units of length (m, cm) <i>confine to totals that can be readily checked by measuring</i>	5.1.15 solve and complete practical tasks and problems involving the addition, subtraction, multiplication and simple division of units of length (m, cm, km)		5.1.20 use and interpret scales on maps and plans <i>identify given scale on a map or plan and draw items to a larger or smaller scale</i>

The child should be enabled to

	Third Class	Fourth Class	Fifth Class	Sixth Class
Weight	<p>5.2.11 estimate, compare, measure and record the weight of a wide variety of objects using appropriate metric units (kg, g)</p> <p><i>everyday objects, books, piles of copybooks lighter and heavier than 1 kg objects showing that there is no constant relationship between weight and size handle and compare objects as an aid to estimation</i></p>	<p>5.2.13 estimate, compare, measure and record the weight of a wide variety of objects using appropriate metric units (kg, g) and selecting suitable instruments of measurement)</p> <p><i>use and select from bathroom scales, kitchen scales, spring balance become familiar with major and minor markings on scales (e.g. 100 g markings, half kg, quarter kg</i></p>	<p>5.2.17 select and use appropriate instruments of measurement</p> <p><i>choose measurement instruments appropriate to given tasks, e.g. balance, kitchen scales, bathroom scales and spring balance</i></p>	
		<p>5.2.14 rename units of weight in kg and g</p> <p><i>2 kg 250 g = 2250 g</i></p>		<p>5.2.19 rename measures of weight</p> <p><i>rename measurements of appropriate metric units express results as fractions or decimals of appropriate metric units</i></p> <p><i>750 g = 0.75 kg</i> <i>4 kg 45 g = 4.045 kg</i></p>
		<p>5.2.15 rename units of weight using decimal or fraction form</p> <p><i>250 g = 0.25 kg = quarter kg confine to examples requiring only two places of decimals</i></p>		

	<p>5.2.12 solve and complete practical tasks and problems involving the addition and subtraction of units of weight (kg and g)</p> <p><i>confine to totals which can be readily checked by weighing</i></p>	<p>5.2.16 solve and complete practical tasks and problems involving the addition, subtraction, multiplication and simple division of units of weight (kg and g)</p>	<p>5.2.18 estimate and measure weight using appropriate metric units</p> <p><i>estimate and measure a large variety of objects use appropriate measuring units grams (pencils and copybooks) kilograms (school bags and people)</i></p>	
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The child should be enabled to

	Third Class	Fourth Class	Fifth Class	Sixth Class
Capacity	<p>5.3.10 estimate, compare, measure and record the capacity of a wide variety of objects using appropriate metric units (l, ml)</p> <p><i>use cartons, spoons, cups, jugs, plastic bottles and other common containers use litre, 250 ml and 500 ml measuring containers use tall, low, wide and narrow containers</i></p>	<p>5.3.12 estimate, compare, measure and record capacity using appropriate metric units (l, ml) and selecting suitable instruments of measurement</p> <p><i>become familiar with major and minor markings on measuring containers (e.g. 100 ml markings, half l, quarter l)</i></p>	<p>5.3.16 select and use appropriate instruments of measurement</p> <p><i>choose measurement instruments appropriate to given tasks graduated jugs, litre containers or fractional litre containers</i></p>	
		<p>5.3.13 rename units of capacity in l and ml</p> <p><i>1500 ml = 1 l 500 ml</i></p>	<p>5.3.17 estimate and measure capacity using appropriate metric units</p> <p><i>estimate and measure a large variety of objects use appropriate measuring units millilitres (cups), litres (watering-can)</i></p>	
			<p>5.3.14 rename units of capacity using decimal and fraction form</p>	

		<p><i>250 ml = 0.25 l = quarter litre</i></p> <p><i>2 l 150 ml = 2150 ml = 2.15 l</i></p> <p><i>confine to examples requiring only two places of decimals</i></p>		<p><i>rename measurements of appropriate metric units</i></p> <p><i>express results as fractions or decimals of appropriate metric unit</i></p> <p><i>625 ml = 5 eighths of a litre = 0.625 l</i></p> <p><i>8 l 253 ml = 8.253 l</i></p>	
5.3.11	<p>solve and complete practical tasks and problems involving the addition and subtraction of units of capacity (l, ml)</p> <p><i>confine to totals that can be readily checked by measuring</i></p>	5.3.15	<p>solve and complete practical tasks and problems involving the addition, subtraction, multiplication and simple division of units of capacity (l, ml)</p>	5.3.19	<p>find the volume of a cuboid experimentally</p> <p><i>fill a cuboid container with water and measure capacity in litres</i></p> <p><i>fill a cuboid container with unit cubes and count</i></p>

The child should be enabled to

	Third Class	Fourth Class	Fifth Class	Sixth Class
Time	<p>5.4.12 consolidate and develop further a sense of time passing</p> <p><i>place daily, weekly, monthly and annual events in sequence</i></p> <p><i>discuss movement of hands of clock or sand in hourglass as indicating passing of time</i></p> <p><i>refine and develop vocabulary of time</i></p> <p><i>before/after, a long time ago, last year, last month, yesterday, immediately, soon, tomorrow, in a week's time, for a short/long time</i></p>			
	<p>5.4.13 read time in five-minute intervals on analogue and digital clock (12-hour)</p> <p><i>count in fives up and down number line, hundred square and clock face</i></p> <p><i>construct simple clock face and relate intervals</i></p> <p><i>quarter hour = 15 min = 3 x 5 min</i></p> <p><i>discuss and record times of a variety of common events, school and home activities, television programmes</i></p>	<p>5.4.19 read time in one-minute intervals on analogue and digital clock (12-hour)</p>		

Time	5.4.14 record time in analogue and digital forms	5.4.20 express digital time as analogue time and vice versa		
	5.4.15 read and interpret simple timetables <i>school, bus, train, television schedules.</i>		5.4.22 read and interpret timetables and the 24-hour clock (digital and analogue) <i>bus, train, air, ship, films, theatre, school, class</i>	
	5.4.16 rename minutes as hours and hours as minutes <i>confine work to five-minute intervals 70 min = 1 hour 10 min</i>		5.4.23 interpret and convert between times in 12-hour and 24-hour format <i>10:30 p.m. = 22:30 hours 07:50 hours = 7:50 a.m.</i>	
	5.4.17 read dates from calendars and express weeks as days and vice versa <i>collect and record significant personal dates and dates in life of school and family</i>			5.4.24 explore international time zones <i>identify and discuss the need for time zones calculate time differences between Ireland and other countries</i>
	5.4.18 solve and complete practical tasks and problems involving times and dates <i>practical problems that can be readily checked by measurement</i>	5.4.21 solve and complete practical tasks and problems involving times and dates and the addition and subtraction of hours and minutes <i>practical problems that can be readily checked by measurement add hours and minutes separately 4 hours 45 minutes + 3 hours 25 minutes = 7 hours 70 min</i>		5.4.25 explore the relationship between time, distance and average speed <i>measure, using a stop-watch, the time taken for short journeys to be completed or short distances to be covered and compile database to examine averages</i>

The child should be enabled to

	Third Class	Fourth Class	Fifth Class	Sixth Class
Money	5.5.8 rename amounts of euro or cents and record using symbols and decimal point	5.5.10 rename amounts of money as euro or cents and record using e symbol and decimal point <i>125 cents = €1.25 and €3.56 = 356 cents</i>	5.5.12 compare 'value for money' using unitary method <i>compare the cost of 6 apples costing 75 cents and 4 apples costing 50 cents calculate pay, based on hourly or daily rate calculate totals of shop bills</i>	5.5.13 explore value for money <i>calculate sale prices, e.g. 10% discount, 20% VAT added</i>
	5.5.9 solve and complete one-step problems and tasks involving the addition and subtraction of money	5.5.11 solve and complete practical one-step and two-step problems and tasks involving the addition, subtraction, multiplication and simple division of money		5.5.14 convert other currencies to euro and vice versa <i>identify and discuss exchange rates from newspaper calculate major currency equivalents for basic sums of euro convert sums of money in other currencies to euro equivalents</i>

The child should be enabled to

	Third Class	Fourth Class	Fifth Class	Sixth Class
Area	5.6.2 estimate, compare and measure the area of regular and irregular shapes <i>counting non-standard square units</i>	<i>use standard square units: sq. cm, sq. m (cm², m²)</i>	5.6.3 discover that the area of a rectangle is length by breadth <i>determine by repeated experiments using rectangles with sides measured in whole centimetres and square units of one square centimetre</i>	5.6.7 recognise that the length of the perimeter of a rectangular shape does not determine the area of the shape <i>construct rectangles of constant perimeter with varying areas</i>
			5.6.4 estimate and measure the area of regular and irregular 2-D shapes <i>measure a wide variety of regular and irregular shapes using square units of one square centimetre and one square metre</i>	5.6.8 calculate the area of regular and irregular 2-D shapes <i>estimate and calculate area of shapes, and check by measuring with square centimetre units circles: calculate by counting squares only</i>
				5.6.9 measure the surface area of specified 3-D shapes <i>measure 3-D surfaces by measuring individual 2-D faces or by extending into nets</i>

Area			<p>5.6.5 calculate area using square centimetres and square metres</p> <p><i>choose appropriate measuring units: square centimetres (smaller objects) square metres (large objects or rooms)</i></p>	<p>5.6.10 calculate area using ares and hectares</p> <p><i>fields, large playgrounds, car parks</i></p>
			<p>5.6.6 compare visually square metres and square centimetres</p>	<p>5.6.11 identify the relationship between square metres and square centimetres</p> <p><i>explore and compare areas of one, four, twenty-five and one hundred square centimetres to establish relationships</i></p>
				<p>5.6.12 find the area of a room from a scale plan</p> <p><i>measure and calculate area of rectangular shapes by partitioning into rectangles and combining individual areas extend to finding area of room plans (rectangular) extend to using scale to find area of rooms from plans</i></p>

The child should be enabled to

	Third Class	Fourth Class	Fifth Class	Sixth Class
Representing and interpreting data	<p>6.1.10 collect, organise and represent data using pictograms, block graphs and bar charts</p> <p><i>collect data from the environment and record in tabular form</i> <i>represent data in appropriate format</i> <i>discuss strengths and limitations of the format used</i> <i>use simple scale in block graphs and bar charts</i> <i>use computer applications if available to organise and represent data</i></p>	<p>6.1.13 collect, organise and represent data using pictograms, block graphs, bar charts and bar-line graphs incorporating the scales 1:2, 1:5, 1:10, and 1:100</p> <p><i>use scales appropriate to the range of numbers for this level</i></p>	<p>6.1.15 collect, organise and represent data using pictograms, single and multiple bar charts and simple pie charts</p> <p><i>collect data from the environment in tabular form and represent in appropriate format</i> <i>discuss and explore modes of representation</i></p>	<p>6.1.20 collect, organise and represent data using pie charts and trend graphs</p> <p><i>sales or rainfall per month</i></p>
	<p>6.1.11 read and interpret tables, pictograms, block graphs and bar charts</p>	<p>6.1.14 read and interpret bar-line graphs and simple pie charts</p> <p><i>involving use of halves, thirds and quarters</i></p>	<p>6.1.16 read and interpret pictograms, single and multiple bar charts, and pie charts</p> <p><i>examine and discuss class-based examples and interpret charts from newspapers, magazines and computer generated charts</i></p>	<p>6.1.21 read and interpret trend graphs and pie charts</p> <p><i>e.g. height or weight in relation to age</i></p>

Representing and interpreting data			<p>6.1.17 compile and use simple data sets</p> <p><i>compile lists of statistics from children's experiences e.g. personal data (height, age, hair colour) sports results (wins, losses, scores)</i></p> <p><i>use data as source for representation, interpretation and setting problems</i></p>		
			<p>6.1.18 explore and calculate averages of simple data sets</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><i>identify the most frequently occurring item in a data set calculate average by adding all the values and dividing by the number of items (use a calculator)</i></p> </td> <td style="width: 50%; vertical-align: top;"> <p><i>identify the most frequently occurring item in a data set compare calculated averages with the most frequently occurring items</i></p> </td> </tr> </table>	<p><i>identify the most frequently occurring item in a data set calculate average by adding all the values and dividing by the number of items (use a calculator)</i></p>	<p><i>identify the most frequently occurring item in a data set compare calculated averages with the most frequently occurring items</i></p>
	<p><i>identify the most frequently occurring item in a data set calculate average by adding all the values and dividing by the number of items (use a calculator)</i></p>	<p><i>identify the most frequently occurring item in a data set compare calculated averages with the most frequently occurring items</i></p>			
6.1.12 use data sets to solve and complete practical tasks and problems	<p><i>solve simple problems using data collected from own environment</i></p>	6.1.19 use data sets to solve problems	<p><i>solve problems based on data sets and representations used in class what were the most popular buns at a cake sale?</i></p>		

The child should be enabled to

	Third Class	Fourth Class	Fifth Class	Sixth Class
Chance	6.2.1 use vocabulary of uncertainty and chance: possible, impossible, might, certain, not sure	6.2.4 use vocabulary of uncertainty and chance: chance, likely, unlikely, never, definitely		
	6.2.2 order events in terms of likelihood of occurrence <i>examine and discuss the likelihood of occurrence of simple events and order from least likely to most likely</i> <i>Our school will be closed next Monday</i> <i>The sun will shine for two hours tomorrow</i> <i>The teacher will fall asleep at 11 o'clock today</i>			
	6.2.3 identify and record outcomes of simple random processes <i>toss a coin ten or twenty times and record results</i> <i>draw a cube from a bag containing, for example, 4 blue cubes and 8 red cubes a number of times, replacing the drawn cube each time; discuss results</i>	<i>toss a coin, roll a die ten or twenty times and record results</i> <i>draw a cube from a bag of two red, one blue and one yellow cube a number of times, replacing drawn cube each time; discuss results and record outcomes</i>	6.2.5 identify and list all possible outcomes of simple random processes <i>discuss and list all possible outcomes of:</i> <i>rolling a die (1,2,3,4,5,6)</i> <i>tossing two coins (2 heads, 2 tails, head and tail)</i> <i>drawing a cube from a bag containing blue, red and green cubes (blue cube, red cube, green cube)</i>	<i>discuss and list all possible outcomes of:</i> <i>rolling two dice and calculating the total (2,3,4...12)</i> <i>selecting two numbers at random from the numbers 1,2,3,4,5 (ten possibilities)</i>
			6.2.6 estimate the likelihood of occurrence of events	6.2.8 estimate the likelihood of occurrence of events; order on a scale from 0 to 100%, 0 to 1

if we toss a coin, say, 100 times, how many heads would we expect to get? a head has 50 chances in 100, or 1 chance in 2, of appearing; heads and tails are equally likely to occur if we roll a die; how often would we expect to get a 2? (1 chance in 6); each of the 6 outcomes is equally likely; this activity can be done in groups with each child or group throwing a die (or coin) 20 times and pooling the results; discuss the fairness of board games

when tossing a coin, a head has 1 chance in 2 of occurring; thus the likelihood of a head is 1 in 2, or $\frac{1}{2}$ or 50%, similarly for a tail when rolling a die, each outcome has a 1 in 6 chance of occurring – therefore the likelihood is $\frac{1}{6}$ when drawing a cube from a bag containing 3 red and 6 blue cubes, a blue cube has 6 chances in 9 of occurring and thus has a probability of $\frac{6}{9}$ or $\frac{2}{3}$; the probability of drawing a red cube is $\frac{3}{9}$ or $\frac{1}{3}$ what if the bag contains 5 red, 5 blue and 5 green cubes? or 3 red, 6 blue and 6 green?

6.2.7 construct and use frequency charts and tables

*perform the experiment (toss a coin, roll a die, draw a cube from a bag containing 3 blue cubes and 6 green cubes...) a large number of times (50-100) times
this activity can be done in groups with each child or group throwing the die (or coin) 20 times and pooling the results
record the outcomes and use to construct a frequency table; for example, if drawing a cube from a bag as above, the table might be as follows:*

*perform the experiment (toss two coins, draw a cube from a bag containing a number of different-coloured cubes) a large number of times; larger numbers of throws can be achieved by using group work
record the outcomes and use to construct a frequency table; for example, when tossing two coins, the table might look as follows:*

colour	number of times drawn
Blue	36
Green	64

we estimate the likelihood of a blue cube to be 36 in 100 and that of a green cube to be 64 in 100 discuss: is that what we expected? data sets compiled from children's experiences (personal data, weather, sports) might be used; for example, a survey of favourite cereals might have produced the following table:

cereal	number of pupils who prefer it
Corn flakes	19
Porridge	4
Crispies	9
Muesli	3

the likelihood that a pupil picked at random prefers corn flakes to be 19 in 35

outcome	frequency
2 heads	20
2 tails	28
1 head, 1 tail	52

we estimate the chance of 2 heads to be 20/100, that of 2 tails to be 28/100, that of one head and one tail to be 52/100: discuss, is this what we expected? using two coins of different colours may help examine a table of school attendance for the class what is the chance of full attendance on any one day? what is the chance of more than 20% of the class being absent on any one day? pupils are given a bag and told it contains 10 cubes in 3 different colours; by drawing a cube repeatedly, say 50 times, and constructing a frequency table, they must estimate how many cubes of each colour there are in the bag

NCCA would like to acknowledge the work of the Primary Curriculum Support Programme (PCSP) and the School Development Planning Support (SDPS) who developed similar resources for curriculum support in the past. This document, *Re-presented Content Objectives: Mathematics*, which was developed by NCCA draws on the original work of the Primary Professional Development Service (PPDS) who designed and developed 'glance cards' which highlighted key curriculum content and the progression in objectives from infants to 6th class. We would like to thank them for their contribution to the early stages of our work in re-presenting the curriculum.