



# SCHOOL CURRICULUM: ANNUAL PLANNER FOR MATHEMATICS – Y5

PNC PROGRAMME OF STUDY			SCHOOL PROGRESSION			
AOL	REF	STATEMENTS The children will be taught to	LEARNING OBJECTIVES To be able			
			1	2	★	
number & place value	1	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit	to read numbers to 100 000 to write numbers to 100 000 to determine the value of each digit in a six-digit number to compare 2 six-digit numbers using < and > to order 4 six-digit numbers to read numbers to 1000 000 to write numbers to 1000 000 to read numbers as words to 1 000 000 and match to numerals to determine the value of each digit in a seven-digit number to compare 2 seven-digit numbers using < and > to order 4 seven-digit numbers	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓    ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
	2	count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000	to count forwards in steps of 10, 100 and 1000 from any four-digit number to count forwards in steps of 10, 100, 1000 and 10 000 from any five-digit number to count forwards in steps of 10, 100, 1000, 10 000 and 100 000 from any six-digit number	✓ ✓	✓ ✓	✓ ✓
	3	interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero	to recognise where negative numbers appear in the real life situations to count forwards in single steps from a two-digit negative number through zero to count backwards in single steps from any positive two digit number through zero to count backwards in single steps from any two-digit negative number to count forwards in steps of two from a two-digit negative number through zero to count backwards in steps of two from a two-digit positive number through zero to count backwards in steps of two from any two-digit negative number	✓ ✓ ✓	✓  ✓ ✓ ✓ ✓	✓ ✓ ✓



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Number - number & place value	4	round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000	to round any five-digit number to the nearest 10 to round any six-digit number to the nearest 10 to round any five-digit number to the nearest 100 to round any six-digit number to the nearest 100 to round any five-digit number to the nearest 1000 to round any six-digit number to the nearest 1000 to round any five-digit number to the nearest 10 000 to round any six-digit number to the nearest 10 000 to round any five-digit number to the nearest 100 000 to round any six-digit number to the nearest 100 000 to round any five-digit number to the nearest 1 000 000 to round any six-digit number to the nearest 1 000 000	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
	5	solve number problems and practical problems that involve all of the above	to compare numbers up to 1 000 000 to solve number problems to compare numbers up to 1 000 000 to solve real-life problems to order numbers up to 1 000 000 to solve number problems to order numbers up to 1 000 000 to solve real-life problems to calculate the difference between a negative number and a positive number to solve number problems to calculate the difference between a negative number and a positive number to solve real-life problems to recognise and linear number sequences (including those involving fractions and decimals)	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
	6	read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	to read Roman numerals to 200 to read Roman numerals in multiples of 10 to 200 to read any two-digit Roman numeral to 999 to know that M represents 1000 to recognise years written in Roman numerals	✓ ✓	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓

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 Y5 Unit progression 1-2-15-11-4-12 5-8-16-6-13-9 3-17-7-14-10-18

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AOL	REF	STATEMENTS The children will be taught to	LEARNING OBJECTIVES To be able			3	4	★			
Number - addition and subtraction	7	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	to add 2 five-digit numbers using written methods (stage 6)	to subtract a five digit number from a larger five digit number using written methods (stage 6)	to add 2 decimal numbers using written methods (same number of decimal places)(stage 6)	to subtract a decimal number from a larger decimal number using written methods (same number of decimal places)(stage 6)	to add 2 decimal numbers using written methods (different number of decimal places)(stage 6)	to subtract a decimal number from a larger decimal number using written methods (different number of decimal places)(stage 6)	✓	✓	✓
	8	add and subtract numbers mentally with increasingly large numbers	to add a four-digit multiple of 100 to a five digit number mentally	to subtract a four-digit multiple of 100 from a five-digit number mentally					✓	✓	✓
	9	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	to round to the nearest ten, hundred or thousand to check whether an answer is likely	to know what to round to, to find the balance between accuracy and estimating					✓	✓	✓
	10	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.	to solve multi-step problems involving addition and subtraction mentally	to solve multi-step problems involving addition and subtraction using formal written methods	to justify and explain how a problem was answered				✓	✓	✓



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AOL	REF	STATEMENTS The children will be taught to	LEARNING OBJECTIVES To be able	5	6	7	8	★
Number - multiplication and division	11	identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers	to know the terms factors and multiples and give examples of each to be able to list all the factor pairs of a given number to be able to list the common factors of two numbers	✓ ✓	✓ ✓	✓ ✓	✓	✓
	12	know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers	to know the terms prime numbers and composite numbers to know that a prime number only has two factors to know what a prime factor is and be able to give an example		✓ ✓ ✓	✓		✓
	13	establish whether a number up to 100 is prime and recall prime numbers up to 19	to be able to work out whether any number <100 is a prime number to know and have rapid recall of all the prime numbers to 19		✓	✓ ✓		✓
	14	multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers	to multiply a four digit number by a one-digit number using the short method of multiplication (stage 8) to multiply 2 two-digit numbers using the compact method for long multiplication (stage 8)	✓	✓		✓ ✓	
	15	multiply and divide numbers mentally drawing upon known facts	to have rapid recall of the times tables facts to 12x12 to use their times tables knowledge to identify related division facts to use the law of distributivity to calculate harder questions mentally e.g. $a(b + c) = ab + ac$				✓	✓ ✓
	16	divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context	to divide a four-digit number by a one-digit number using short division (stage 8) to express the remainder after a division calculation as a fraction or decimal to interpret the remainder in a division calculation, rounding up or down depending on the context. (stage 8)	✓	✓		✓ ✓	✓ ✓



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Number - multiplication and division	17	multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	to multiply or divide whole number or decimal by 10 by moving the digits one place to the left or right	to multiply or divide whole number or decimal by 100 by moving the digits two places to the left or right	to multiply or divide whole number or decimal by 1000 by moving the digits three places to the left or right	✓				✓
	18	recognise and use square numbers and cube numbers, and the notation for squared ( <sup>2</sup> ) and cubed ( <sup>3</sup> )	to use an array to show where the term square numbers originates	to use x tables knowledge to give square numbers to 12x12	to know the term cubed means to multiply by itself 3 times			✓		✓
			to calculate out cube numbers to 12x12x12	to construct equivalence statements using squared and cubed numbers (e.g. $4 \times 35 = 2 \times 2 \times 35$ ; $3 \times 270 = 3 \times 3 \times 9 \times 10 = 9^2 \times 10$ )					✓	
	19	solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes	to solve multi-step problems involving multiplication and division	to solve word problems requiring interpretation of the remainder after division	to use the knowledge that multiplication is the inverse of division to solve missing digit calculations	✓		✓		
			to use the associative law with factor pairs to make a balanced calculation (e.g. $3 \times 12 = 3 \times 6 \times 2$ )	to solve problems relating to area by using square numbers	✓		✓			
			to solve problems relating to capacity by using cubed numbers					✓		
20	solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	to solve complex, multi-step problems involving use of all four operations	to understand that equals means 'the same as'	to create balanced equations with the equals sign in the middle (e.g. $1 \times 2 \times 3 = 12 - 6$ )	✓	✓	✓	✓	✓	

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Number - x & ÷	21	solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.	to use and explain the equals sign to indicate equivalence, including in missing number problems(e.g. $13 + 24 = 12 + 25$ ; $33 = 5 \times ?$ ) to multiply and divide by powers of 10 and 100 to produce scale drawings					✓	✓	✓	✓

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AOL	REF	STATEMENTS The children will be taught to	LEARNING OBJECTIVES To be able				
			9	10	11	★	
Number - fractions (including decimals and percentages)	22	compare and order fractions whose denominators are all multiples of the same number	to compare two fractions with the same denominator	✓			
			to order four fractions with the same denominator	✓			
			to find the common denominator for two fractions which are multiples of the same number	✓			
			to convert two fractions so they have a common denominator		✓		
		to compare four fractions by converting them to have a common denominator		✓			
	23	identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	to use diagrams to identify equivalent fractions	✓			
			to know how to find equivalent fractions through multiplication and division of the numerator and denominator	✓	✓		✓
			to explain why two fractions may or may not be equivalent		✓		
	24	recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements $> 1$ as a mixed number [for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$ ]	to continue a sequence of counting in fractions beyond one whole	✓			
			to know that a mixed number is a whole number and a fraction		✓		
			to know that an improper fraction shows the same information as a mixed number		✓		
			to convert from a mixed number to an improper fraction with diagrams to support and vice versa		✓		
			to convert from a mixed number to an improper fraction and vice versa		✓		
			to write mathematical statements using mixed numbers and improper fractions e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$		✓		
	25	add and subtract fractions with the same denominator and denominators that are multiples of the same number	to add and subtract two fractions with the same denominator		✓		
			to use knowledge of common denominators to convert fractions to the same denominator before adding or subtracting		✓		
			to add and subtract two fractions with different denominators that are multiples of the same number		✓		

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AOL	REF	STATEMENTS The children will be taught to	LEARNING OBJECTIVES To be able	9	10	11	★	
fractions (including decimals and percentages) Number -	26	multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	to multiply a proper fraction by a whole number using physical fraction shapes to multiply a proper fraction by a whole number using icons of fraction shapes and diagrams to multiply a mixed number by a whole number using physical fraction shapes to multiply a mixed number by a whole number using icons of fraction shapes and diagrams		✓			
	27	read and write decimal numbers as fractions [for example, $0.71 = \frac{71}{100}$ ]	to say numbers to one decimal place as a fraction and vice versa to write numbers to one decimal place as a fraction and vice versa to say numbers to two decimal places as a fraction and vice versa to write numbers to two decimal places as a fraction and vice versa	✓ ✓		✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	
	28	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	to relate thousandths in place value to thousandths in fractions to say how many thousandths are in $1/100$ , $1/10$				✓ ✓	
	29	round decimals with two decimal places to the nearest whole number and to one decimal place	to round decimals with two decimal places to the nearest tenth to round decimals with two decimal places to the nearest whole number	✓	✓	✓ ✓		
	30	read, write, order and compare numbers with up to three decimal places	to read numbers to up to three decimal places to write numbers to up to three decimal places to understand that numbers with two decimal places have a zero placeholder in place of the third decimal place to compare 2 numbers with up to two decimal places to compare 2 numbers with up to three decimal places to order 4 numbers with up to two decimal places to order 4 numbers with up to three decimal places	✓ ✓ ✓ ✓ ✓			✓ ✓ ✓ ✓ ✓	





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AOL	REF	STATEMENTS The children will be taught to	LEARNING OBJECTIVES To be able	9	10	11	★
fractions (including decimals and percentages) Number -	31	solve problems involving number up to three decimal places	to solve missing number problems involving multiplication and division by 10, 100 and 1000 with numbers up to three decimal places to solve addition and subtraction problems involving numbers <sup>3</sup> up to three decimal places to count forwards in decimals up to 3 decimal places e.g. in 0.005s from 0.125 to count backwards in decimals up to 3 decimal places e.g. in 0.005s from 0.125 to calculate the decimal compliments to 1 e.g. $0.829 + 0.171 = 1$ to solve puzzles with numbers to three decimal places			✓	
	32	recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal	to understand that per-cent means out of 100 to write percentages as fractions with 100 as the denominator to write percentages as decimals to make connections between fractions, decimals and percentages e.g. $20\% = 20/100 = 1/5 = 0.2$			✓	✓
	33	solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$ , $\frac{1}{4}$ , $\frac{1}{5}$ , $\frac{2}{5}$ , $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25.	to know the percentage and decimal equivalencies for $\frac{1}{2}$ , $\frac{1}{4}$ , $\frac{1}{5}$ , $\frac{2}{5}$ , $\frac{4}{5}$ and $\frac{1}{10}$ to know the percentage and decimal equivalencies of fractions with a denominator of a multiple of 10 or 25 to solve problems involving percentages that require knowledge of their fraction and decimal equivalencies			✓	✓

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AOL	REF	STATEMENTS The children will be taught to	LEARNING OBJECTIVES To be able			
			12	13	14	★
Measurement	34	convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)	✓			✓
				✓		✓
					✓	✓
	35	understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints	✓			✓
			✓			✓
				✓		✓
					✓	✓
	36	measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres	✓			✓
			✓			
			✓			
			✓			



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AOL	REF	STATEMENTS The children will be taught to	LEARNING OBJECTIVES To be able	12	13	14	★
Measurement	37	calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm <sup>2</sup> ) and square metres (m <sup>2</sup> ) and estimate the area of irregular shapes	to calculate the area of non-rectilinear shapes by counting squares and triangles to estimate the area of non-rectilinear shapes with irregular sides to know that area is measured in cm <sup>2</sup> , m <sup>2</sup> etc to know the algebraic formula for calculating the area of a rectilinear shape (l x w) to use the formula for calculating the area of rectilinear shapes to compare the area of rectilinear shapes	✓ ✓ ✓ ✓			✓   ✓
	38	estimate volume [for example, using 1 cm <sup>3</sup> blocks to build cuboids (including cubes)] and capacity [for example, using water]	to know that volume is the amount of space within a 3-D shape and capacity is the amount of liquid within it to know that volume is measured in cm <sup>3</sup> , m <sup>3</sup> etc to use physical objects to build cuboids e.g. cm <sup>3</sup> blocks and estimate their capacity		✓ ✓ ✓		
	39	solve problems involving converting between units of time	to use all four operations to solve problems involving time (including days – weeks – fortnights)	✓	✓	✓	✓
	40	use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.	to use all four operations to solve problems involving finding the perimeter of composite shapes to use all four operations to solve problems involving conversion between metric units of measurement to use all four operations to solve problems involving conversion between metric and imperial units of measurement to calculate the area from scale drawings using given measurements	✓ ✓ ✓ ✓			

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			15	16	17	★
Geometry – properties of shape	41	identify 3-D shapes, including cubes and other cuboids, from 2-D representations		✓		✓
	42	know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles		✓	✓	
	43	draw given angles, and measure them in degrees (°)		✓		✓
	44	Identify angles at a point and one whole turn (total 360°), angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°), and other multiples of 90°				✓
	45	use the properties of rectangles to deduce related facts and find missing lengths and angles				✓
	46	distinguish between regular and irregular polygons based on reasoning about equal sides and angles.		✓		✓



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Geometry – properties of shape	47	identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.	to reflect a simple shape on a grid in a mirror line to reflect a complex shape on a variety of grids in a mirror line to know that rotating keeps a shape the same dimensions to recognise whether a shape has been rotated or reflected to use tracing paper to rotate a shape 90° clockwise or anti-clockwise on a co-ordinate grid about one of its angles to use tracing paper to rotate a shape 90° clockwise or anti-clockwise on a co-ordinate grid about a point	✓ ✓ ✓ ✓ ✓ ✓	✓   ✓ ✓		

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AOL	REF	STATEMENTS The children will be taught to	LEARNING OBJECTIVES To be able	18	+
Statistics	48	solve comparison, sum and difference problems using information presented in a line graph	to know that a line graph is used to represent how one result is directly related to another e.g. the population of a town from year to year to explain what a line graph tells them e.g. “I can see that the population of Grantham fell from 2008 until 2010 when it began to increase slowly” to read points on a line graph that fall exactly on grid lines to read points on a line graph that fall between two grid lines to compare two results on a line graph e.g. how much did the population of Grantham increase by between 2010 and 2015?	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓
	49	complete, read and interpret information in tables, including timetables.	to read a table of discrete data to interpret and answer questions on a table of discrete data to complete a table of discrete data to meet set criteria to read a table of grouped data to interpret and answer questions on a table of grouped data to complete a table of grouped data to meet set criteria to read a timetable to interpret and answer questions on a timetable	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓