St. John the Evangelist Catholic Academy

Part of the Newman Catholic Collegiate

Mathematics Progression Ladders
Year 6

- Blue highlighting denotes specific material moved down from a higher year.
- Yellow highlighting denotes content not explicit in the PNS for the year. It often indicates little more than an expansion and clarification of what was already being taught using the PNS. Also highlighted is the same material in all 3 terms, where it is typically taught in the autumn term, but used and reinforced in subsequent terms.
- **Purple text** denotes repeated statements.
- *Italics* indicate illustrative examples, non-statutory notes and guidance from the new PoS. (NB most of the non-statutory notes and guidance are new, from a higher year, or beyond the PNS.)

Y6 section	Advancing 2	Deep 1	Deep 2
NUMBER			
Number and place value	• Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit *e.g. What must be added to 26 523 to change it to 54 525?* • Numbers up to 10 000 000 and beyond can be quickly ordered independently. Numbers up to 10 000 000 are quickly ordered independently • Round any whole number to a required degree of accuracy *e.g. round 265 496 to the nearest 10 000 (270 000)* • Solve number and practical problems that involve number, place value and rounding *e.g. What is the largest 5-digit number whose digits sum to 20? (99200).* • Generally, negative numbers in contexts are used and intervals across zero are calculated. • Generally, numbers up to 10 000 000 can be written. • Generally, Roman numerals are read up to 1000 (M). • With support, years written in Roman form are beginning to be deciphered. • With reminders, numbers up to 10	• Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit • Round any whole number to a required degree of accuracy *e.g. Give an example of a number which you might round to the nearest 10? Nearest 10 000?* • Use negative numbers in context, and calculate intervals across zero *e.g. how much warmer is 5°C than -4°C? (9°C)* • Solve number and practical problems that involve number, place value and rounding *e.g. What is the smallest number which rounds to 35 000, to the nearest 1000?* (34 500). •	• Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit • Round any whole number to a required degree of accuracy *e.g. What is the smallest number which rounds to 500 000, to the nearest 1000?* (499 500). • Use negative numbers in context, and calculate intervals across zero • The value of each digitin any whole number is identified independently. • The value of each digitin any number with up to four decimal places is identified. • Roman numerals are read beyond 1000 (M) and years written in Roman form are deciphered. • Explanations of methods are provided. • • Solve number and practical problems that involve number, place value and rounding *e.g. What is the smallest 4-digit integer whose digits sum to 20? (10199).*

	000 000 can be ordered using all digits. • Numbers up to 10 000 000 are generally compared using all digits. • Generally, the value of each digit in any whole number up to seven-digit numbers, is identified. • • When reminders are given, the value of each digitin a number with up to three decimal places is identified		
Addition, subtraction, multiplication and division	• *Continue to use all the multiplication tables to 12 × 12 in order to maintain their fluency e.g. 84÷12* • *Continue to practise the four operations for larger numbers using the formal written methods of columnar addition and subtraction, short and long multiplication, and short and long division* • start to understand the use of brackets • use calculators to develop and investigate patterns and sequences • use calculators to develop and investigate patterns and sequences • Multiply multi-digit numbers up to 4 digits by a two-digit whole number	• *Continue to use all the multiplication tables to 12 × 12 in order to maintain their fluency* • *Continue to practise the four operations for larger numbers using the formal written methods of columnar addition and subtraction, short and long multiplication, and short and long division* • use their knowledge of the order of operations to carry out calculations involving the four operations • solve problems involving addition, subtraction, multiplication and division■explore the order of operations using brackets e.g. 2+1x3=5; [2+1]x3=9 •	• *Continue to use all the multiplication tables to 12 × 12 in order to maintain their fluency* • *Continue to practise the four operations for larger numbers using the formal written methods of columnar addition and subtraction, short and long multiplication, and short and long division* • Mental strategies to answer calculations, involving adding and subtracting more than two whole numbers, with more than three digits, are developing. • Mental calculations involving increasingly large numbers are solved accurately • Independently calculations are rounded to check and determine levels of accuracy, in the context

	using the formal written method of long multiplication • Generally long division is understood and used correctly. • Remainders are generally accurately interpreted • Generally short division is understood and used correctly. • Remainders are generally accurately interpreted • Multiplication and division questions involving multiples of 10, 100, 1000, etc. are answered by using times table facts, e.g. 6 x 6 = 36, so 60 x 6 = 360 • Simple decimals can be multiplied by a one-digit number. • Generally, the inverse relationship between multiplication and division can be used to check answers. When prompts are provided, estimations and rounding are used to check answers to a calculation. • Generally, common factors, common multiples are identified. • Generally prime numbers are understood and identified • Generally, prime numbers up to 19 are recalled at an increasing speed. • Generally. prime numbers up to 100 are recognised. • With reminders, multiplication and division questions involving multiples	• Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context • use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. • Perform mental calculations, including with mixed operations and large numbers • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why *e.g. Three people won £365 496 on the lottery; one received £197 540, another received £40 010; how much did the third person receive?*	of a problem. • There is an understanding when adding and subtracting negative integers that: - Two unlike signs become a negative sign, e.g.: 8 ! (+2) = 8 ! 2 = 6 7 + (!2) = 7 ! 2 = 5 - Two like signs become a positive sign, e.g.: - 6 ! (!3) = 6 + 3 = 9 • Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • Perform mental calculations, including with mixed operations and large numbers e.g. *(13 400 + 10 600) × 4 ÷ 12 = 8000* • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why *e.g. Write a number story for this number sentence: 23.5 = 20.4 + 4.9 - 1.8* • Multi-step problems involving the four operations can be solved independently and accurately. • Problems involving all four operations are identified, solved independently. • Scaling by fractions is fluent and

	of 10, 100, 1000, etc. are answered correctly. Generally, decimal numbers are multiplied and divided by 10, 100 and 1000 • Generally, there is a secure understanding that a square number is an integer multiplied by itself and the notation for this is 2. • There is an emerging understanding of cubed numbers being an integer multiplied by itself twice and that the notation for this is 3 . • Perform mental calculations, including with mixed operations and large numbers *e.g. (13 500 × 2) ÷ 9 = 3000* • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why *e.g. There are 6534 cars parked in a 3-storey car park; 1398 are on the first floor and 3765 are on the second floor; how many cars are parked on the third floor?* • Solve problems involving addition, subtraction, multiplication and division *e.g. 396 children and 37*	• Solve problems involving addition, subtraction, multiplication and division *e.g. I think of a number and subtract 5.6 from it then multiply the result by 6; the answer is 7.2; what was my number?* • Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy *e.g. A box contains approximately 52 matches; how many boxes can be filled with 10 000 matches?* • Identify common factors, common multiples and prime numbers *e.g. Find the smallest common multiple of 5, 6 and 8 (120)* • Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context • Use their knowledge of the order of operations to carry out calculations involving the four	accurate. • All answers are explained and justified • The BIDMAS rule is beginning to be understood • The inverse relationship between multiplication and division is used to check answers to a calculation. • Estimating and rounding is a strategy confidently used to check answers to a calculation independently • Prime numbers up to 19 are recalled at speed. • Prime numbers up to 100 are recognised. • Multiplication and division questions involving multiples of 10, 100, 1000, 10 000, 100 000, etc. are answered correctly and at speed. Decimal numbers are multiplied and divided by 10, 100, 1000 and 10 000 independently • There is a secure understanding of square and cubed numbers and the notation for both (2 and 3). • Solve problems involving addition, subtraction, multiplication and division *e.g. Club A sold 3500 tickets for £9.50 each and Club B sold 8150 tickets for £3.50; how much more money did Club A make*

	adults went on a school trip; buses seat 57 people; how many buses were needed? • Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy. *e.g. find the perimeter of a football pitch with side lengths 105.3m and 46.8m (estimate: (105+45)×2=300m; actual: (105.3+46.8)×2=304.2m (same number of decimal places as numbers in the question)* • Identify common factors, common multiples and prime numbers *e.g. common factors of 12 and 15 are 1 and 3; common multiples of 4 and 6 are 12, 24, 36…; prime numbers are numbers with exactly 2 factors e.g. 2, 3, 5, 7, 11, 13, …* • Negative integers are added and subtracted; however, reminders or practical contexts to support understanding may be necessary	operations *and using brackets; e.g. 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9.*	*than Club B?* • Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy • Identify common factors, common multiples and prime numbers *e.g. Find the highest common factor of 120, 90 and 75 (15) or Find all the prime numbers between 80 and 100.* • Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context • Use their knowledge of the order of operations to carry out calculations involving the four operations *and using brackets e.g. 14 x (29 – 12) + 7 = 245*
FRACTIONS			
Fractions (including decimals and percentages)	• Use common factors to simplify fractions *e.g. as the numerator and denominator have a common factor*	• Use common factors to simplify fractions; use common multiples to express fractions in the same	• Use common factors to simplify fractions; use common multiples to express fractions in the same

	of 4, $^{12}/_{16}$ can be simplified to $^{3}/_{4}$; use common multiples to express fractions in the same denomination *e.g. as the denominators have a common multiple of 12, $^{3}/_{4}$ and $^{5}/_{6}$ can both be expressed in twelfths i.e. $^{9}/_{12}$ and $^{10}/_{12}$ respectively* • *List equivalent fractions to identify fractions with common denominators* • Compare and order fractions, including fractions >1 *e.g. put these fractions in order from the smallest: $^{5}/_{4,}$ $^{5}/_{8,}$ $^{3}/_{2,}$ $^{14}/_{8}$* • Numbers are converted between mixed numbers and improper fractions with prompts or reminders if necessary • Identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places *e.g. 205.6 ÷ 100 =2.056* • Multiply one-digit numbers with up to two decimal places by whole numbers *e.g. 0.6 x 7*	denomination • *List equivalent fractions to identify fractions with common denominators* • Compare and order fractions, including fractions >1 *e.g. put these fractions in order from the smallest: $^{5}/_{4,}$ $^{5}/_{6,}$ $^{3}/_{2,}$ $^{4}/_{3}$* • Associate a fraction with division and calculate decimal fraction equivalents *e.g. 0.375* for a simple fraction *e.g. $^{5}/_{8}$* • *Use understanding of relationship between unit fractions and division to work backwards by multiplying a quantity that represents a unit fraction to find the whole quantity e.g. if $\frac{1}{4}$ of a length is 36cm, then the whole length is 36 × 4 = 144cm* • Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions *e.g. $^{1}/_{2}$ + $^{1}/_{8}$ = $^{5}/_{8}$* • Identify the value of each digit to three decimal places and multiply	denomination • *List equivalent fractions to identify fractions with common denominators* • Equivalent fractions including tenths and hundredths are independently identified, named and written. • Compare and order fractions, including fractions >1 *e.g. put these fractions in order from the smallest: $^{5}/_{4,}$ $^{5}/_{6,}$ $^{3}/_{5,}$ $^{4}/_{3}$* • Decimals that have a mixture of one, two or three decimal places can be ordered • Fractions whose denominators are all multiples of the same number are ordered independently and at speed. • Numbers are converted between mixed numbers and improper fractions independently • Decimals with up to three decimal places can be rounded to the nearest whole number. Decimals with up to three decimal places can be rounded to one decimal places • Numbers with up to three decimal places can be read, written and ordered

	• Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts *e.g. order $^{4}/_{5}$, 75%, 0.9, $^{19}/_{20}$* • Generally, problems which require knowing percentage and decimal equivalents of 1/5, 2/5, 4/5 and fractions with a denominator of a multiple of 10 or 25, are solved. • Generally, fractions with the same denominator are added and subtracted. • Generally, denominators that are multiples of the same number are added and subtracted independently, e.g. 1/3 + 2/6 = 2/3. • When prompts are provided, fractions with different denominators and mixed numbers can be added and subtracted by using the concept of equivalent fractions. • Generally, proper fractions and mixed numbers can be multiplied by whole numbers using materials and diagrams. • Generally, simple pairs of proper fractions can be multiplied, the answer being written in its simplest form. • Generally, proper fractions can be	and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places *e.g. × 100 = 140.8* • Multiply one-digit numbers with up to two decimal places by whole numbers *e.g. 0.06 x 8* • Use written division methods in cases where the answer has up to two decimal places *e.g. 458 ÷ 8 = 57.25* • *Multiply and divide numbers with up to two decimal places by one-digit and two-digit whole numbers e.g. 3.15 × 62* • Multiply simple pairs of proper fractions, writing the answer in its simplest form [e.g. 1/4x1/2=1/8] • Solve problems which require answers to be rounded to specified degrees of accuracy *and check the reasonableness of answers.* • Recall and use equivalences between simple fractions, decimals and	• Decimal numbers, including 0.33 and 0.66 can be converted into fractions. • Equivalent fractions of a given fraction, including tenths and hundredths can be identified, named and written independently. Thousandths can be related to tenths, hundredths and decimal equivalents independently • Associate a fraction with division and calculate decimal fraction equivalents *e.g. 0.375* for a simple fraction *e.g. $^{5}/_{8}$* • *Use understanding of relationship between unit fractions and division to work backwards by multiplying a quantity that represents a unit fraction to find the whole quantity e.g. if $^{1}/_{5}$ of a mass is 150g, then the whole mass is 150 × 5 = 750g* • Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions *e.g. $1^{3}/_{4} - {}^{5}/_{6} = {}^{11}/_{12}$* • *Use a variety of images to support understanding of multiplication with*

	divided by whole numbers. • Generally, numbers are multiplied by 10 100 and 1000. • Generally, numbers are divided by 10,100 and 1000 giving answers up to three decimal place • Generally, problems involving the calculation of percentages are calculated. • Generally, problems that involve calculating and comparing percentages are solved • Generally decimals with two decimal places are rounded to one decimal place • With reminders, numbers with up to three decimal places can be read, written and ordered. • When reminders are given, problems involving number up to three decimal places are solved. • The per cent symbol (%) is understood and related to 'number of parts per hundred'. • • Percentages as a fraction with denominator 100 and as a decimal are written, e.g. 30/100 = 30% = 0.30. • Common decimal numbers, 0.5, 0.1-0.9, 0.25 and 0.75, can be converted into fractions with reminders if necessary	percentages, including in different contexts. *e.g. find a fraction which lies between 0.4 and 0.5* • Solve problems which require answers to be rounded to specified degrees of accuracy	*fractions* • Multiply simple pairs of proper fractions, writing the answer in its simplest form e.g. $\frac{1}{4} \times {}^{1}/_{2} = {}^{1}/_{8}$ • Simple pairs of proper fractions can be multiplied, the answer being written in its simplest form • Divide proper fractions by whole numbers e.g. ${}^{1}/_{3} \div 2 = {}^{1}/_{6}$ • Identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places *e.g. ☐ ÷ 1000 = 0.45* • Multiply one-digit numbers with up to two decimal places by whole numbers *e.g. 0.04 x 12* • Use written division methods in cases where the answer has up to two decimal places *e.g. 693 ÷ 15 = 14.2* • *Multiply and divide numbers with up to two decimal places by one-digit and two-digit whole numbers e.g.*

	• Recall and use equivalences between simple fractions, decimals and percentages, • Thousandths are recognised in numbers up to three decimal places when prompts are given. Generally, thousandths can be related to tenths, hundredths and decimal equivalents • Associate a fraction with division and calculate decimal fraction equivalents [e.g. 0.375] for a simple fraction [e.g. 3/8] •		*93.15 ÷ 5* • Solve problems which require answers to be rounded to specified degrees of accuracy *and check the reasonableness of answers.* • Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts *e.g. find a decimal which lies between $^3/_8$ and $\frac{1}{2}$* • Problems are solved using more complex equivalences, such as 2/5 into decimals and percentages. • Problems involving numbers up to three decimal places are solved independently • Percentages as a fraction with denominator 100 and as a decimal are written, e.g. 43/100 = 43%. Percentage values of a given value or quantity can be identified and solved, even when the percentage is complex, e.g. 16% of 96 = 15.36 • Equivalence between most fractions, decimals and percentages are recalled and used independently in a number of contexts.
Ratio and proportion	• Solve problems involving the relative sizes of two quantities	• Solve problems involving the relative sizes of two quantities	• Solve problems involving the relative sizes of two quantities

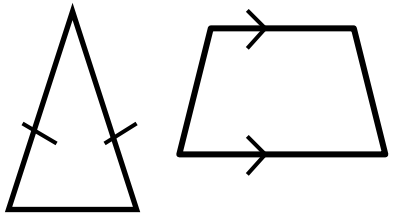
	where missing values can be found by using integer multiplication and division facts *e.g. adjust a recipe for 4 people, to serve 20 people* • solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison, multiples of 5 and 10. • solve problems involving similar shapes where the scale factor is known or can be found	where missing values can be found by using integer multiplication and division facts *e.g. adjust a recipe for 4 people, to serve 6 people* • Solve problems involving similar shapes where the scale factor is known or can be found *e.g. two rectangular picture frames are the same shape, but one is bigger than the other; the smaller one measures 10cm by 15cm; the larger frame has a width of 30cm, what is its length?* • *Begin to use the notation a : b to record ratio* • Solve problems involving the calculation of percentages (e.g. measures) such as 15% of 360 and the use of percentages for comparison • *Link percentages of 360° to calculating angles of pie charts* • Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples *e.g. for every egg you need three spoons of flour, how*	where missing values can be found by using integer multiplication and division facts *e.g. adjust a recipe for 6 people, to serve 15 people* • Solve problems involving similar shapes where the scale factor is known or can be found *e.g. On a map 2cm represents 1km; a road measures 7cm on the map, how long is it in real life?* • *Use the notation a : b to record ratio* • Solve problems involving the calculation of percentages (e.g. measures) such as 15% of 360 and the use of percentages for comparison • *Link percentages of 360° to calculating angles of pie charts* • Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples *e.g. the ratio of boys to girls in class 6 is 1:2; there are 8 boys, how many girls are there?.*

		many eggs are needed for 12 spoons of flour?	

Algebra	• *Use symbols and letters to represent variables and unknowns in mathematical situations…*
	  ○ *missing numbers, lengths, coordinates and angles e.g. 3x=24 or the angles in a triangle are 35°, 120° and y°; find y*
	  ○ *mathematics and science formulae e.g. A=l×w*
	  ○ *arithmetic rules e.g. a+b=b+a*
	• Express missing number problems algebraically *e.g. 17 = x + 4.*
	• generate and describe linear number sequences
	• Use simple formulae expressed in words *e.g. write a formula for the number of months, m, in y years. (y=12m)*
	• Enumerate all possibilities of combinations of two variables *e.g. investigate how many different ways 2 red eggs can be placed in a*
		• *Use symbols and letters to represent variables and unknowns in mathematical situations…*
		  ○ *missing numbers, lengths, coordinates and angles e.g. 5y+1=16 or the angles in an isosceles triangle are 50°, y° and y°; find y*
		  ○ *mathematics and science formulae e.g. P=2(l+w)*
		  ○ *arithmetic rules e.g. a×b=b×a*
		  ○ *generalising number patterns e.g. 3, 6, 9, 12, … 3n*
		  ○ *number puzzles e.g. a+b=8.5 and a×6=15; find a and b*
		• Express missing number problems algebraically *e.g. the perimeter of a triangle is 20cm; it has two sides of length 8cm; what is the length of the other side? (20=2×8+x so x=4cm)*
		• Use simple formulae expressed in words *e.g. write a formula for the cost of a party, C, which costs £100 plus £2 per person, n.*
			• *Use symbols and letters to represent variables and unknowns in mathematical situations…*
			  ○ *missing numbers, lengths, coordinates and angles e.g. 68=6t-4 or the angles in a kite are x°, x°, 15° and 53°; find x, or plot points (x, y) where x+y=10*
			  ○ *mathematics and science formulae e.g. $A=\frac{1}{2}(l\times h)$*
			  ○ *arithmetic rules*
			  ○ *generalising number patterns e.g. 6, 11, 16, 21, … 5n+1*
			  ○ *number puzzles e.g. x+y=10 and 2x+y=13; find x and y*
			• Express missing number problems algebraically *e.g. I'm thinking of a number; I double it and subtract 12 from the result; the answer is 60; what was my number? (2x-12=60, so 2x=72, so x=36)*
			• Use simple formulae expressed in words *e.g. write a formula for the cost of a taxi journey, C, which is £2.10 plus £1.60 per kilometre, k.*

	6-space egg carton, by starting with a 3-space carton, 4-space carton etc?	*(C=100+2n)* • Enumerate all possibilities of combinations of two variables *e.g. investigate all possible half-time scores when the full time score of a football match is 4:2* • Generate and describe linear number sequences *e.g. write the first 5 terms in a 'decrease by 9' sequence starting from 20, or find the nth term of a simple sequence e.g. 4, 8, 12, 16, … 4n* • Find pairs of numbers that satisfy number sentences involving two unknowns. *e.g. a – b = 5, give pairs of values that a and b could have (e.g. 8, 3 or 6.5, 1.5 or …) or. p×q=24; if p and q are both positive, even numbers, list all the possible combinations (e.g. 2×12, 4×6, …)*	*(C=2.10+1.60k)* • Enumerate all possibilities of combinations of two variables *e.g. list all the combinations of boys and girls in a class where there are twice as many boys as girls and between 25 & 35 children in the class altogether.* • Generate and describe linear number sequences *e.g. 6, 13, 20, 27, … 7n-1* • Find pairs of numbers that satisfy number sentences involving two unknowns. *e.g. a – b = 5, give pairs of values that a and b could have (e.g. 8, 3 or 6.5, 1.5 or …)*
MEASUREMENT			
Measurement	• Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to three decimal places *e.g. 4.52kg =*	• Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to three decimal places	• Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to three decimal places

	4520g; 1.005km = 1005m • Convert between miles and kilometres • Recognise that shapes with the same areas can have different perimeters and vice versa *e.g. investigate rectangles with areas of 24cm^2 to find which has the smallest perimeter* • Recognise when it is possible to use formulae for area of shapes *e.g. find the length of rectangle which is 4m wide and has the same area as a square with a side length of 8cm.* • Calculate the area of triangles, *relating it to the area of rectangles, e.g. compare the 'counting squares' method to using the formula for the area of a triangle*	• Recognise that shapes with the same areas can have different perimeters and vice versa *e.g. investigate triangles with areas of 12cm^2 to find which has the smallest perimeter* • Recognise when it is possible to use formulae for area and volume of shapes *e.g. find the length of the side of a cube with a volume of 27cm^3* • Calculate the area of parallelograms and triangles, *relating it to the area of rectangles, e.g. compare the 'counting squares' method to using the formula for the area of a parallelogram* • Solve problems involving the calculation and conversion of units of measure, using decimal notation to three decimal places where appropriate *e.g. Ben walked 850m to the bus stop, travelled on a bus for 8.67km and then a train for 120.9km; how far did he travel altogether?*	• Recognise that shapes with the same areas can have different perimeters and vice versa *e.g. investigate parallelograms with areas of 24cm^2 to find which has the smallest perimeter* • Recognise when it is possible to use formulae for area and volume of shapes *e.g. find the height of cuboid which is 12cm long, 2cm high and has the same volume as a cube with sides of 6cm* • Calculate the area of parallelograms and triangles, *relating it to the area of rectangles* • Solve problems involving the calculation and conversion of units of measure, using decimal notation to three decimal places where appropriate *e.g. A jug holds 550ml; how may jugs of water are needed to fill a 4.8 litre bucket?* • convert between miles and kilometres *and other units commonly used e.g. use a conversion line graph or be able to work out that 6 pints of milk is a bit more*

		• Convert between miles and kilometres *and other units commonly used e.g. know that a mile is approximately 1.6km (and 1km is approximately 0.6miles) and use this to make rough calculations* • Calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3) and extending to other units, such as mm^3 and km^3.	*than 3 litres* • calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3) and extending to other units, such as mm^3 and km^3. • *Begin to use compound units for speed e.g. miles per hour*
GEOMETRY			
Properties of shapes	• Draw 2-D shapes using given dimensions and angles *using measuring tools and conventional markings and labels for lines and angles e.g. same length lines, parallel lines and same size angles:*  • Recognise, describe and build simple 3-D shapes, including making	• Draw 2-D shapes using given dimensions and angles *using measuring tools and conventional markings and labels for lines and angles e.g. complete a triangle with given lengths and angles* • Recognise, describe and build simple 3-D shapes, including making nets *e.g. visualise 3-D shapes drawn on isometric paper and begin to draw 2-D representations of 3-D shapes* • Compare and classify geometric shapes based on their properties	• Draw 2-D shapes using given dimensions and angles *using measuring tools and conventional markings and labels for lines and angles e.g. construct a triangle or complete a parallelogram with given lengths and angles* • Recognise, describe and build simple 3-D shapes, including making nets • Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and

	nets *e.g. investigate different nets for a cube, recognising when 'nets' will fold to make a cube and when they will not.*	and sizes (*e.g. parallel sides, line symmetry, types of angles etc)* and find unknown angles in any triangles, quadrilaterals, and regular polygons • Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles *describing them algebraically e.g. a=180-(b+c).*	regular polygons • Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles *describing them algebraically e.g. a=180-(b+c)* • Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius *describing it algebraically as d=2×r*
Position and direction	• Describe positions on the full coordinate grid (all four quadrants) *e.g. (-3, 7)* • Draw and translate simple shapes on the coordinate plane, and reflect them in the axes. • *Predict missing coordinates of quadrilaterals by using the properties of shapes, which may be expressed algebraically e.g. translating vertex (a, b) to (a-2, b+3), or find the other vertices of a square, given two of them are (a, b) and (a+d, b+d)*	• Describe positions on the full coordinate grid (all four quadrants) • Draw and translate simple shapes on the coordinate plane, and reflect them in the axes. • *Predict missing coordinates of quadrilaterals by using the properties of shapes, which may be expressed algebraically e.g. translating vertex (a, b) to (a-2, b+3), or find the other vertices of a square, given two of them are (a, b) and (a+d, b+d)*	• Describe positions on the full coordinate grid (all four quadrants) • Draw and translate simple shapes on the coordinate plane, and reflect them in the axes. • *Predict missing coordinates of quadrilaterals by using the properties of shapes, which may be expressed algebraically e.g. translating vertex (a, b) to (a-2, b+3), or find the other vertices of a square, given two of them are (a, b) and (a+d, b+d)* • *Draw and label a pair of axes in all four quadrants with equal scaling.*

STATISTICS			

Use and interpret data	• Interpret and construct pie charts and line graphs and use these to solve problems *e.g. draw a pie chart to show how Jack spends his £36 birthday money:*
	  ○ *£9 snacks*
	  ○ *£15 toys*
	  ○ *£12 books*
	• *Encounter and draw graphs relating two variables, arising from their own enquiry and in other subjects e.g. a scattergraph connecting heights of children and their long-jump distance*
	• Interpret pie charts and line graphs and use these to solve problems
		• Calculate and interpret the mean as an average. *e.g. find the mean height of these children: 1.2m, 1.07m and 1.12m*
		• Interpret and construct pie charts and line graphs and use these to solve problems *e.g. create a conversion graph for pounds and Euros*
		• *Encounter and draw graphs relating two variables, arising from their own enquiry and in other subjects.*
			• Calculate and interpret the mean as an average.
			• Interpret and construct pie charts and line graphs and use these to solve problems *e.g. connect conversion from kilometres to miles in measure to its graphical representation.*
			• *Encounter and draw graphs relating two variables, arising from their own enquiry and in other subjects.*