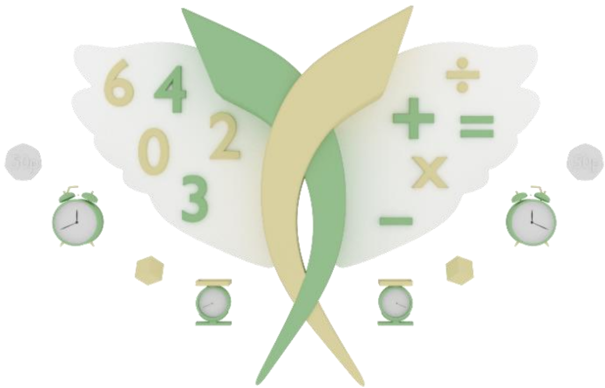
National Curriculum 2014

Planning Materials

Year 6



Purpose of study

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

Aims

The National Curriculum for mathematics aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

The principal focus of mathematics teaching Upper Key Stage 2

- The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.
- At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.
- By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.
- Pupils should read, spell and pronounce mathematical vocabulary correctly.

Year 6 programme of study (statutory requirements)

Number and place value	Addition, subtraction, multiplication and division	Fractions (including decimals and percentages)	Ratio and proportion
• 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 • use negative numbers in context, and calculate intervals across zero • solve number and practical problems that involve all of the above.	• 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 • divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context • perform mental calculations, including with mixed operations and large numbers • identify common factors, common multiples and prime numbers • use their knowledge of the order of operations to carry out calculations involving the four operations • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why • solve problems involving addition, subtraction, multiplication and division • use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.	• use common factors to simplify fractions; use common multiples to express fractions in the same denomination • compare and order fractions, including fractions >1 • add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions • multiply simple pairs of proper fractions, writing the answer in its simplest form [e.g. $^{1}/_{4} \times {}^{1}/_{2} = {}^{1}/_{8}$] • divide proper fractions by whole numbers [e.g. $^{1}/_{3} \div 2 = {}^{1}/_{6}$]. • associate a fraction with division to calculate decimal fraction equivalents [e.g. 0.375] for a simple fraction [e.g. $^{3}/_{8}$] • 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 • multiply one-digit numbers with up to two decimal places by whole numbers • use written division methods in cases where the answer has up to two decimal places • solve problems which require answers to be rounded to specified degrees of accuracy. • recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.	• solve problems involving the relative sizes of two quantities, where missing values can be found by using integer multiplication and division facts • solve problems involving the calculation of percentages [e.g. of measures such as 15% of 360] and the use of percentages for comparison • solve problems involving similar shapes where the scale factor is known or can be found • solve problems involving unequal sharing and grouping using knowledge of fractions and multiples **Algebra** • use simple formulae • generate and describe linear number sequences • express missing number problems algebraically • find pairs of numbers that satisfy an equation involving two unknowns • enumerate all possibilities of combinations of two variables

Measurement	Geometry: properties of shapes	Geometry: position and direction	Statistics
• solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate • 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 • convert between miles and kilometres • recognise that shapes with the same areas can have different perimeters and vice versa • recognise when it is possible to use the formulae for area and volume of shapes • calculate the area of parallelograms and triangles • 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 [e.g. mm^3 and km^3].	• draw 2-D shapes using given dimensions 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 regular polygons • illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius • recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles	• 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.	• interpret and construct pie charts and line graphs and use these to solve problems • calculate and interpret the mean as an average. AB BC MATHS

Year 6 Notes and Guidance (non-statutory)

Number and place value	Addition, subtraction, multiplication and division	Fractions (including decimals and percentages)	Ratio and proportion
• Pupils should use the whole number system, including saying, reading and writing numbers accurately.	• Pupils practise addition, subtraction, multiplication and division for larger numbers, using the efficient written methods of columnar addition and subtraction, short and long multiplication, and short and long division (see Mathematic Appendix). • They undertake mental calculations with increasingly large numbers and more complex calculations. • Pupils continue to use all the multiplication tables to calculate mathematical statements in order to maintain their fluency. • Pupils round answers to a specified degree of accuracy e.g. to the nearest 10, 20, 50 etc., but not to a specified number of significant figures. • Pupils explore the order of operations using brackets; for example, 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9. • Common factors can be related to finding equivalent fractions.	• Pupils should practise, use and understand the addition and subtraction of fractions with different denominators by identifying equivalent fractions with the same denominator. They should start with fractions where the denominator of one fraction is a multiple of the other (e.g. $^{1}/_{2} + ^{1}/_{8} = ^{5}/_{8}$) and progress to varied and increasingly complex problems. • Pupils should use a variety of images to support their understanding of multiplication with fractions. This follows earlier work about fractions as operators (fractions of), as numbers, and as equal parts of objects, for example as parts of a rectangle. • Pupils use their understanding of the 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 $^{1}/_{4}$ of a length is 36cm, then the whole length is 36 x 4 = 144cm). • They practise with simple fractions and decimal fraction equivalents to aid fluency, including listing equivalent fractions to identify fractions with common denominators. • Pupils can explore and make conjectures about converting a simple fraction to a decimal fraction (e.g. 3 ÷ 8 = 0.375). For simple fractions with recurring decimal equivalents, pupils learn about rounding the decimal to three decimal places, or other appropriate approximations depending on the context. Pupils multiply and divide numbers with up to two decimal places by one-digit and two-digit whole numbers. Pupils multiply decimals by whole numbers, starting with the simplest cases, such as 0.4 x 2 = 0.8, and in practical contexts, such as measures and money. • Pupils are introduced to the division of decimal numbers by one-digit whole numbers and, initially, in practical contexts involving measures and money. They recognise division calculations as the inverse of multiplication. • Pupils also develop their skills of rounding and estimating as a means of predicting and checking the order of magnitude of their answers to decimal calculations. This includes rounding answers to a specified degree of accuracy and checking the reasonableness of their answers.	• Pupils recognise proportionality in contexts when the relations between quantities are in the same ratio (e.g. similar shapes, recipes). • Pupils link percentages or 360° to calculating angles of pie charts. • Pupils should consolidate their understanding of ratio when comparing quantities, sizes and scale drawings by solving a variety of problems. They might use the notation a:b to record their work. • Pupils solve problems involving unequal quantities e.g. 'for every egg you need three spoonfuls of flour', '$^{3}/_{5}$ of the class are boys'. These problems are the foundation for later formal approaches to ratio and proportion. **Algebra** • Pupils should be introduced to the use of symbols and letters to represent variables and unknowns in mathematical situations that they already understand, such as: – missing numbers, lengths, coordinates and angles – formulae in mathematics and science – arithmetical rules (e.g. a + b = b + a) – generalisations of number patterns – number puzzles (e.g. what two numbers can add up to).

Measurement	Geometry: properties of shapes	Geometry: position and direction	Statistics
• Pupils connect conversion (e.g. from kilometres to miles) to a graphical representation as preparation for understanding linear/proportional graphs. • They know approximate conversions and are able to tell if an answer is sensible. • Using the number line, pupils use, add and subtract positive and negative integers for measures such as temperature. • They relate the area of rectangles to parallelograms and triangles, e.g. by dissection, and calculate their areas, understanding and using the formulae (in words or symbols) to do this. • Pupils could be introduced to compound units for speed, such as miles per hour, and apply their knowledge in science or other subjects as appropriate.	• Pupils draw shapes and nets accurately, using measuring tools and conventional markings and labels for lines and angles. • Pupils describe the properties of shapes and explain how unknown angles and lengths can be derived from known measurements • These relationships might be expressed algebraically e.g. d = 2 × r; a = 180 - (b + c).	• Pupils draw and label a pair of axes in all four quadrants with equal scaling. This extends their knowledge of one quadrant to all four quadrants, including the use of negative numbers. • Pupils draw and label rectangles (including squares), parallelograms and rhombuses, specified by coordinates in the four quadrants, predicting missing coordinates using the properties of shapes. These might be expressed algebraically e.g. translating vertex (a, b) to (a - 2, b + 3); (a, b) and (a + d, b + d) being opposite vertices of a square.	• Pupils connect their work on angles, fractions and percentages to the interpretation of pie charts. • Pupils both encounter and draw graphs relating two variables, arising from their own enquiry and in other subjects. • They should connect conversion from kilometres to miles in measure to its graphical representation. • Pupils know when it is appropriate to find the mean of a data set.

Number and Place Value

Yr6 Statutory requirements

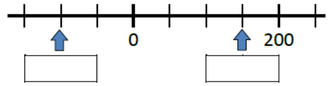
- **read, write, order and compare numbers up to 10 000 000 and determine the value of each digit**
- **round any whole number to a required degree of accuracy**
- **use negative numbers in context, and calculate intervals across zero**
- **solve number and practical problems that involve all of the above.**

Autumn

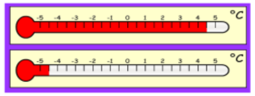
- secure knowledge of place value with numbers with two decimal places (in preparation for Autumn 2)
- count on and back from any given number, in powers of 10 *e.g. Count in ones from 7 990 996, count back in hundreds from 1 001 560*
- know the number that is a power of 10 more/less than any given number to at least ten million *e.g. What is 1 000 more than 999 999, 10ml less than 10 005ml*
- read and write numbers up to ten million *e.g. Read this number 5 648 129, 6 004 002. Write the number equivalent to 'four million seven hundred and sixty-two thousand and nine', 'three million two hundred and seven'*
- know what each digit represents in numbers to ten million *e.g. Explain which is the greater value, the five in 3 516 067 or the 5 in 5 816 207? What is the seven worth in 7 123 564, in 701 245?*
- partition numbers up to ten million in different ways
- compare and order numbers and explain thinking *e.g. Which is more 501 thousands or 5 millions? Is this statement correct 8 154 123cm > 8 415 123cm? Explain why. Put these in ascending order 4 159 236, 1 459 623, 4 519 271*
- round any whole number to a given accuracy *e.g. What is 572 567 to nearest thousand? 43 213 to the nearest hundred? 5 469 345 to the nearest million?*
- estimate to the nearest 10, 100, 1 000, 10 000, 100 000, 1 000 000 *e.g. Would you estimate these numbers to the nearest 10, 100, 1 000, 10 000, 100 000 or 1 000 000? The size of a Premier League football crowd; the number of people on a full bus; the number of children in a school; the number of people in the world*
- solve problems in different contexts *e.g. I round a number to the nearest 10 and get 2 million. What could my number be? Roger won £4 251 000, Dylan won £4 521 000, Neil won £4 065 000 and Ann won £4 250 900 on the lottery. Who won the second highest amount? Using the digit cards 3, 4, 7, 8, 0 and 1, what is the closest number that can be made to half a million?*

Spring

- identify and position positive and negative numbers on a number line *e.g.*



- compare negative numbers using < > *e.g. -6℃ □ 4℃, 6℃ □ -4℃, -6℃ □ -4℃, -4℃ □ -6℃*
- order a set of positive and negative numbers in context *e.g. Order the following places from coldest to warmest: Russia 7°C, Antarctic Peninsula -10°C, Canada -73.5°C, Greenland –64.9°C. How much colder is it in Greenland than Russia?*
- calculate intervals between positive and negative numbers by finding the difference *e.g. Convince me that -12 is greater than -18. The answer was -6°C. What was the question? What is the temperature difference of the two thermometers?*



What is the difference in temperature between the inside of a freezer at -18°C and outside the freezer at 15°C? The temperature inside an aeroplane is 19°C. The temperature outside the plane is -31°C.What is the difference in temperature?

- solve problems involving negative numbers in different contexts *e.g. The temperature in Ottawa dropped 6 degrees from 4°C. What is the new temperature? In one month, the temperature at the South Pole dropped from -28°C to -55°C. Work out the difference between the highest and lowest temperature. If the temperature rose by 8°C, what would the new temperature be?*

My Park Bird Bank Account – weekly		
Money I have	**Money I spend**	**Overdrawn by**
£45	£53	- £8
£56	£78	
£23	£66	
£70	£105	

Summer

ABBC MATHS

Apply knowledge to solve mathematical problems or puzzles

Addition, Subtraction, Multiplication & Division

Yr 6 Statutory requirements

- **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**
- **divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context**
- **perform mental calculations, including with mixed operations and large numbers**
- **identify common factors, common multiples and prime numbers**
- **use their knowledge of the order of operations to carry out calculations involving the four operations**
- **solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why**
- **solve problems involving addition, subtraction, multiplication and division**
- **use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.**

ABC MATHS

Autumn 1

- know times tables to 12 x 12 and the related division facts and relate to multiples of 10
- investigate the factors of different numbers *e.g. Numbers with an odd number of factors are square numbers. Do you agree or disagree?*
- find common factors of two or more numbers
- identify prime numbers less than 100 using knowledge of multiples and tests of divisibility
- explore and establish patterns within prime numbers *e.g. All primes baring 2 and 5 end in a 1, 3, 7 or 9*
- multiply and divide numbers mentally using known facts *e.g. 143 x 8*
- secure division of up to four-digit numbers by a one-digit number using short division *e.g. 987 ÷ 7*
- divide three-digit numbers by two-digit numbers using short division *e.g. 432 ÷ 15*
- secure multiplication of numbers with up to four-digits by a one-digit number using the formal written method *e.g. 3429 x 6*
- solve problems involving addition, subtraction, multiplication and division

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Autumn 2

- derive related facts using known multiplication and division facts *e.g. 7 x 0.8, 0.03 x 7, 5.6 = □ x 8*
- secure mental calculation with all four operations using place value and knowledge of number facts *e.g. + - x ÷ these numbers by 1000, 100, 10, 0.1 12 453, 678, 7 008, 25*
- solve problems using knowledge of multiples *e.g. My age is a multiple of 7. In a year's time it will be a multiple of 5. How old am I?*
- multiply two then three-digit numbers by a two-digit number using the formal written method of long multiplication *e.g. 48 x 26, 56 x 34, 345 x 24*
- secure division of three-digit numbers by two-digit numbers using short division expressing remainders as a whole number, decimal or fraction
- estimate to check answers to determine levels of accuracy *e.g. 50 x 30 or 50 x 20 to check 48 x 26*
- solve problems using all four operations, deciding which operations and methods to use and why

Spring 1

- use brackets to explore the order of operations using acronyms such as BODMAS to support (brackets first then ÷ x + -) *e.g. (34 – 18) x 4 brackets then multiply*
- carry out calculations involving the four operations using knowledge of the order of operations *e.g. (4 x 9) + □ = 41 using the digits 2, 4, 5, 7 and 9 make each of the following number: 41, 59, 93, 87 and 160*
- estimate to check answers to calculations to determine levels of accuracy
- divide three-digit numbers by two-digit numbers using the formal written method of long division, expressing remainders as whole numbers *e.g. 999 ÷ 18*
- secure long multiplication of three-digit numbers by a two-digit number, using the formal written method of long multiplication *e.g. 467 x 28*
- long multiplication of four-digit numbers by a two-digit number, using the formal written method of long multiplication *e.g. 2547 x 36*
- solve problems involving addition, subtraction, multiplication and division

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Spring 2

- calculate mentally using factors *e.g. 310 x 5 = (310 x 10) ÷ 2 where 2 and 5 are factors of 10, 210 ÷ 14 =(210 ÷ 7) ÷ 2*
- secure and use knowledge of brackets to determine the order of operations to carry out calculations involving all four operations, including when solving problems *e.g. For sports day a school made 80 litres of squash. By 1.30 Yr 1&2 have drunk 9.3 litres and the Yr 3, 4, 5 & 6 have drunk 26.75 litres. How much squash is left? 26.7 – (9.3 + 26.75)*
- perform mental calculations including with mixed operations *e.g.*

6	x6	$\frac{2}{6}$ of it	+125	41 less	x100	halve it

- secure division of three, progressing to four-digit numbers by two-digit numbers using the formal written method of long division, interpreting remainders according to context *e.g. Divide 3 458 football cards between 16 children*

Summer

- use known facts to derive related facts fluently *e.g. I know 6 x 7 = 42 therefore I know 60 x 700 = 42 000, 0.6 x 0.7 = 0.42, 4 200 ÷ □ = 0.42*
- secure knowledge of multiples, factors, primes, squares and cubes *e.g. Choose a number. Roll a dice and work out if the number is divisible by the number rolled*

497	62	890	575
142	864	3 495	43
7 679	21	759	376

- secure knowledge of mental strategies including with mixed operations and large numbers *e.g. $(34 – 28)^2 – 17$, $72 ÷ (7^2 – 43)^2$, 99 989 – 1 001, two sides of a regular octagon measure 15cm, what is the perimeter of the octagon?*
- round to a degree of accuracy in context *e.g. Sandra is having 20 guests to her firework party. Sparklers are sold in packs of 8. How many packs should she buy?*
- secure written methods in all four operations, including the use of rounding to make sensible estimates and the use of inverse to check answers
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why *e.g. The Ricoh Arena has a capacity of 32 609. 12 456 home team fans and 8 397 away team fans attended the match. How many seats remained empty?*
- solve problems involving addition, subtraction, multiplication and division *e.g. What is the cost of four adults, 3 children under 8 and 5 children over 8 to visit the Park?*

  Swan Gate Wildlife Park

  Adults £13.78

  Children over 9 years £8.32

  Children under 9 years............£6.49

  Clare works 37 hours a week packing chocolates. If she earns £296 a week, how much does she earn an hour?
- use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy

Apply knowledge to solve mathematical problems or puzzles

Fractions (including decimals and percentages)

Yr 6 Statutory requirements

- **use common factors to simplify fractions; use common multiples to express fractions in the same denomination**
- **compare and order fractions, including fractions >1**
- **add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions**
- **multiply simple pairs of proper fractions, writing the answer in its simplest form [e.g. $^{1}/_{4} \times ^{1}/_{2} = ^{1}/_{8}$]**
- **divide proper fractions by whole numbers [e.g. $^{1}/_{3} \div 2 = ^{1}/_{6}$].**
- **associate a fraction with division to calculate decimal fraction equivalents [e.g. 0.375] for a simple fraction [e.g. $^{3}/_{8}$]**
- **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**
- **multiply one-digit numbers with up to two decimal places by whole numbers**
- **use written division methods in cases where the answer has up to two decimal places**
- **solve problems which require answers to be rounded to specified degrees of accuracy.**
- **recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.**

Autumn 1

- count forwards and backwards in fraction steps
- simplify fractions using common factors *e.g. $^{8}/_{24}$ simplified to $^{4}/_{12}$ or $^{1}/_{3}$*
- find equivalent fractions using multiplication facts
- express two fractions so that they have the same denominator *e.g. $^{1}/_{6}$ and $^{5}/_{12}$ to $^{2}/_{12}$ and $^{5}/_{12}$, $^{1}/_{3}$ and $^{1}/_{4}$ to $^{4}/_{12}$ and $^{3}/_{12}$*
- compare and order factions, including fractions > 1 *e.g. $2^{1}/_{10}$, $1^{3}/_{10}$, $2^{1}/_{2}$, $1^{1}/_{5}$, $1^{3}/_{4}$ Is $4^{2}/_{5} > ^{23}/_{5}$?*
- add proper fractions with different denominators using equivalence *e.g. $^{1}/_{5} + ^{1}/_{3} = ^{3}/_{15} + ^{5}/_{15} = ^{8}/_{15}$*
- add mixed numbers with different denominators using equivalence *e.g. $5^{1}/_{4} + 3^{2}/_{5} = 5^{5}/_{20} + 3^{8}/_{20} = 8^{13}/_{20}$*
- subtract proper fractions with different denominators, using equivalence *e.g. $^{1}/_{3} - ^{1}/_{5} = ^{5}/_{15} - ^{3}/_{15} = ^{2}/_{15}$*
- subtract mixed numbers with different denominators using equivalence *e.g. $5^{2}/_{5} - 3^{1}/_{4} = 5^{8}/_{20} - 3^{5}/_{20} = 2^{3}/_{20}$*

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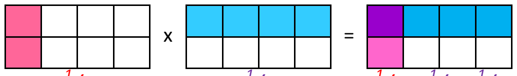
Autumn 2

- know the value of the digits in numbers with up to three decimal places
- read and write decimal numbers *e.g. Write the number equivalent to 45 thousandths*
- compare and order decimals with up to three decimal places *e.g. Explain why 3.12 is less than 3.2*
- round decimals with two decimal places to the nearest decimal place
- understand that multiplying a number by 10 / 100 / 1000 moves the digits 1/2/3 places to the left and dividing a number by 10 / 100 / 1000, moves the digits 1/2/3 places to the right
- multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places *e.g. How many times smaller is 0.074 than 7.4?*
- relate multiplying and dividing by 10, 100 and 1000 to multiplication and division facts *e.g. 0.2 x 8 = 1.6*
- recall and use equivalences between simple fractions, decimals and percentages *e.g.* Is a 25% off sale better than getting $^{1}/_{5}$ off? Why? Place 15%, 0.2, $^{3}/_{4}$, $^{2}/_{5}$, 45% and 0.8 in ascending order

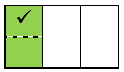
Spring 1

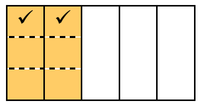
- count forwards and backwards in fraction steps *e.g. How many quarters do you need to get to $3^{1}/_{4}$?*
- find equivalent fractions with a given numerator or denominator using multiplication facts *e.g. $^{\square}/_{4} = ^{18}/_{24} = ^{6}/_{\square}$*
- write a fraction in its simplest form using equivalence *e.g. $^{5}/_{30}$ in its simplest form is $^{1}/_{6}$*
- multiply simple pairs of proper fractions *e.g. $^{1}/_{4} \times ^{1}/_{2}$*



$^{1}/_{4}$ $^{1}/_{2}$ $^{1}/_{4} \times ^{1}/_{2} = ^{1}/_{8}$

- divide a proper fraction by whole numbers *e.g. $^{1}/_{3} \div 2 = ^{1}/_{6}$, $^{2}/_{5} \div 3 = ^{2}/_{15}$*





- solve problems involving fractions of amounts *e.g. if 1/4 of a ribbon is 36cm, what is the length of the whole ribbon?*

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Spring 2

- secure place value in numbers with up to three decimal places *e.g. How would you change 1.235 to 1.205?*
- multiply one-digit numbers with up to two decimal places by whole numbers, explaining why the strategy was chosen e.g. What is 4.75 multiplied by 8? 2.6 x 7 £3.65 x 9 7.3kg x 30
- divide two- or three-digit numbers by one-digit numbers where the answer has up to two decimal places *e.g. 98 ÷ 8, 117 ÷ 5, 523 ÷ 4*
- solve problems involving the above in a range of contexts *e.g. Susie bought six books each costing £4.65, how much did she spend? Planks of wood are 3.4m long, how long would seven planks be? Five friends share a £164 bill equally between them. How much do they each need to pay?*
- solve problems involving rounding answers to a specified degrees of accuracy *e.g. 153m ÷ 4 to the nearest metre. Share £11 equally between eight people to the nearest 10p*

Summer

- know equivalences between simple fractions, decimals and percentages *e.g. The equivalence for halves, quarters, fifths, tenths and hundredths*
- use known equivalences to derive other equivalences *e.g. Using $^{1}/_{5}$ (0.2) to work out $^{1}/_{50}$ (0.02) as a decimal and then a percentage (2%)*
- know and use equivalence in different contexts *e.g. If Mick lost $^{2}/_{5}$ of his races, Steve won 55% of his, who won the most races?*
- calculate the decimal fraction equivalent for a simple fraction using division
  - By multiplying or dividing a known decimal equivalent *e.g. $^{1}/_{8}$ by halving $^{1}/_{4}$ (0.25) and then $^{3}/_{8}$ by multiplying the answer by 3*
  - By dividing the numerator by the denominator *e.g. 3 ÷ 8 using mental or written methods*
- begin to know that $^{1}/_{3}$ is equivalent to 0.333 and $^{2}/_{3}$ is equivalent to 0.667 (to 3 decimal places)
- add fractions with mixed numbers and different denominators- crossing whole number boundary, using the concept of equivalent fractions *e.g. $5^{3}/_{4} + 3^{3}/_{5} = 5^{15}/_{20} + 3^{12}/_{20} = 8^{27}/_{20} = 9^{7}/_{20}$*
- subtract fractions with mixed numbers and different denominators- crossing whole number boundary, using the concept of equivalent fractions *e.g. $4^{1}/_{3} - 2^{4}/_{5} = 5^{5}/_{15} - 3^{12}/_{15} = 4^{20}/_{15} - 3^{12}/_{15} = 1^{8}/_{15}$*
- multiply one-digit numbers with up to two decimal places *e.g. 7.64 x 12, £8.15 x 23*
- divide two- or three-digit numbers by two-digit numbers where the answer has up to two decimal places *e.g. 58 ÷ 25, 636 ÷ 16*
- begin to divide decimal numbers by one-digit whole numbers *e.g. 56.4 ÷ 6*
- solve problems which require answers to be rounded to specified degrees of accuracy *e.g. Troy has worked for the same company for 543 days, how many weeks is that? How many months? 500m of security tape cut into 3 equal lengths, how long is each piece to the nearest tenth? Daisy saves £4.36 each week for 36 weeks, how much did she saved to the nearest pound?*

Ratio & Proportion

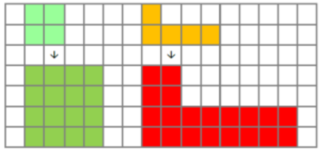
Yr6 Statutory requirements

- **solve problems involving the relative sizes of two quantities, where missing values can be found by using integer multiplication and division facts**
- **solve problems involving the calculation of percentages [e.g. of measures such as 15% of 360] and the use of percentages for comparison**
- **solve problems involving similar shapes where the scale factor is known or can be found**
- **solve problems involving unequal sharing and grouping using knowledge of fractions and multiples**

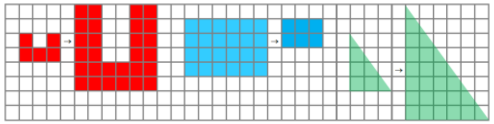
AB BC MATHS

Autumn

- solve scaling problems in a range of context *e.g. One jar of chocolate spread costs 65p. How many will six jars cost? Eight CDs cost £72, how many will 2 CDs cost?*
- know that scaling up involves multiplication and that scaling down involves division *e.g. Scale up by a factor of 5 means to multiply by 5, scale down by a factor of 3 means divide by 3*
- know that scale factor is the amount by which an object has been enlarged or reduced *e.g. The shapes below have been enlarged by a scale factor of 2. That means that every side is now double in length*



- know that the scale factor can be found by dividing a length of the enlarged/reduced shape by the length of the same side on the original shape
- enlarge or reduce a shape using a given scale factor *e.g. Enlarge the triangle by a scale factor of 4. Reduce the parallelogram by a scale factor of 2*
- identify the scale factor used to enlarge or reduce a shape *e.g. What was the scale factor used on these shapes?*



If a hexagon has been enlarged by a scale factor of 7 and the length of a side on the enlarged shape is now 42cm, what was the length of the side on the original hexagon?

Spring

- secure the knowledge that a percentage is a way of expressing a fraction as parts of a hundred, that per cent means in each hundred
- know that 10% can be found by dividing the amount by 10, that 1% can be found by dividing by 100
- investigate making different percentages of amounts using known and related facts *e.g.*

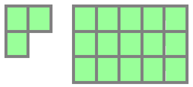
75% = £33.75 ↑   *20% = £9.00* ↑

50% = £22.50 ← **100% = £45** → *10% = £4.50*

↓ *25% = £11.25*   ↓ *1% = £0.45*

Making percentage chains

- explain how to find a percentage of an amount mentally *e.g. 17% of 200*
- calculate percentages that go beyond multiples of 10 *e.g. 15% of 120g, 85% of 4m, 11% of £34, 99% of £15 Would you rather have 22% of £56 or 15% of £70? A school party of 50 is at the Tower of London. 52% are girls. 10% are adults. How many are boys? A football team played 15 games. They won 60%. How many games did they lose? Amy scored 60 out of 80. Kim scored 148 out of 200. Who did better: Amy or Kim? A coat costs £35. It has a 10% discount in a sale. What is its sale price? 10 red sweets are 25% of the total in a jar. How many sweets altogether are in the jar?*
- solve missing number problems e.g. 20% of ☐ = 12m, ☐% of 70 = 21
- write a number as a percentage of another *e.g. There are 10 boys and 15 girls in the class, what percentage are girls? What percentage of £2 is 35p, of 5kg is 200g? What percentage of the large shape is the smaller shape?*



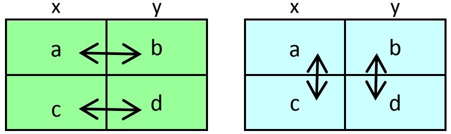
- solve problems involving percentages *e.g. A radio normally costs £50 but has £10 off in the sale. Headphones normally cost £20 but they have £5 off in the sale. Which is the biggest percentage discount?*
- link percentages to pie charts in Statistics *e.g. 20% of 360°*

Summer

- ratio compares one part to another part *e.g. For every 1 red bead there are 2 blue beads. The ratio is 1 red for every 2 blue. It can be written as 1:2*

- proportion compares one part to the whole *e.g. 1 in every 3 is a red bead and 2 in every 3 beads are blue. Proportions can be expressed as fractions 1 in every 3 is $^{1}/_{3}$*
- understand that a four cell diagram is useful when 3 variables are known and one is unknown

Variable x   Variable y   Variable x   Variable y



e.g. *A recipe for 3 people uses 1 banana and 5 apples. I use 20 apples, how many bananas will I need?*

banana	apples
1	4
??	20

x5 ↓

banana	apples
1	4
5	20

How many bananas and apples are needed for 30 people?

people	apples
3	5
30	??

x10 ↓

people	apples
3	5
30	50

- understand direct proportion as the relationship between two variables where the ratio of one to another is known
- solve problems using a four cell diagram
- solve problems in a range of contexts *e.g. Chicken must be cooked 50 minutes for every kg. How long does it take to cook a 3 kg chicken? Rosie shares out 12 stickers. She gives Jim 1 sticker for every 3 stickers she takes. How many stickers does Jim get? At the tennis club, there are 3 boys for every 2 girls. There are 30 children at the club. How many boys are there? There are 5 milk chocolates to every 2 white chocolates in a box of 28 chocolates. How many white chocolates are there in the box? A piggy bank contains 150 £1 coins; Poppy and Daisy agree to share the money between them in the ratio 2:1. How much do they each get?*

Apply knowledge to solve mathematical problems or puzzles

Algebra

Yr6 Statutory requirements

- **use simple formulae**
- **generate and describe linear number sequences**
- **express missing number problems algebraically**
- **find pairs of numbers that satisfy an equation involving two unknowns.**
- **enumerate all possibilities of combinations of two variables.**

Autumn

- express the relationship between numbers in words then symbols *e.g. Finding the perimeter of rectangles expressing the rule in words then symbolically*. *Investigate the relationship between numbers on a hundred square finding the sum of 2 by 2 grids*

1	2
11	12

$S_1 = 26$

5	6
15	16

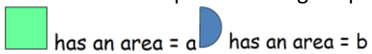
$S_5 = 42$

21	22
31	32

$S_{21} = 106$

Q: If you only know the number in the top left corner can you still work out the sum? Can you find a rule? How might you express this?
Write rules to express relationships such as the number of shoes worn by children in any given class

- understand algebra as an aspect of mathematics where letters and symbols are used to represent unknowns
- form and solve equations using simple shapes *e.g.*



What would the equations for these shapes be?

Which one of these has an equation of 2a + 3b?

If  a - b *what would these equations be?*

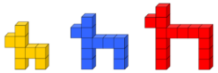
- substitute a given value for an unknown *e.g. If a = 5 and b = 3, what would the area of these shapes be?*

- understand that letters (terms) and numbers together make expressions *e.g. 2a + 3b , when m = 5 calculate the value of each expression m + 2 9 - m 14 + m 5m*
- understand that expressions can be simplified by collecting like terms *e.g. b + b + 2b + 4 = 4b + 4*

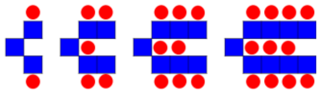
Spring

- know that a list of numbers that follow a pattern or rule is called a sequence
- know that each number or shape in a sequence is called a term of the sequence
- establish that if a rule is not given it can usually be worked out from the first few numbers in the sequence
- understand that a linear sequence increases or decreases by a constant amount *e.g. 1, 4, 7, 10 or 7, 14, 21, 28*
- identify and describe the rule for a sequence in words *e.g. 'add 3' , 'add 7*
- understand that a formula may be written to describe a rule *e.g. n = 3n + 1, n = 7n*
- solve problems involving sequences *e.g. These are the first 3 terms in a sequence. In this sequence of shapes how many will be needed to make the 23rd shape? Form a general statement for the number of matches needed to make any shape.*

Here are the first three dogs in a family. What will the fourth dog look like? How many cubes will be needed to make it? Continue the pattern. How many cubes will be in the nth dog?



*Write the formula for the **number of squares (s)** in **shape number** (n)*



Shape number (n)	1	2	3	4
Number of circles (c)	2	5	8	11
Number of squares (s)	3	5	7	9

- investigate special sequences *e.g. Fibonacci sequence, Pascal's triangle*

Summer

- express missing number problems algebraically *e.g. Here are three equations.*

a + b + c = 30
a + b = 24
b + c = 14
What are the values of a, b and c?

- find pairs of numbers that satisfy an equation involving two unknowns *e.g. p and q each stand for whole numbers. p + q = 1000 and p is 150 greater than q. Work out the values of p and q.*
J and K stand for two numbers. Double j equals half of K. Write two numbers to complete the following sentence: When j is ☐ then k is ☐
- enumerate all possibilities of combinations of two variables *e.g. Here are five number cards:*

A A A B B

A and B stand for two different whole numbers.
The sum of all the numbers on all five cards is 30.
What could be the values of A and B?

k stands for a whole number.
k + 7 is greater than 100
k – 7 is less than 90
Find all the numbers that k could be

Apply knowledge to solve mathematical problems or puzzles

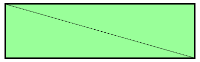
Measures

Yr6 Statutory requirements

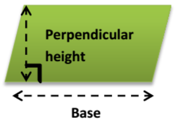
- **solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate**
- **use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to three decimal places**
- **convert between miles and kilometres**
- **recognise that shapes with the same areas can have different perimeters and vice versa**
- **recognise when it is possible to use the formulae for area and volume of shapes**
- **calculate the area of parallelograms and triangles**
- **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 [e.g. mm^3 and km^3].**

Autumn

- read, write and convert between standard units of measures of length, mass and capacity *e.g. What is 6 357ml in litres? 39.4kg in grams? Peter cycles to school 1.45km. How far is this in metres?*
- know that perimeter is the distance around the edge of a shape and area is the space occupied by a two-dimensional shape, measured in square units
- explore the relationship between area and perimeter identifying shapes with the same area but different perimeters and vice versa e.g. *Using squared paper draw a shape where the perimeter is twice its area and vice versa; make the area of your shape go up and the perimeter go down and vice versa*
- know that the area of a rectangle can be found using the rule area = length(l) x width(w) or a = lw
- investigate finding the area of triangles by bisecting rectangles *e.g. Take a rectangle and divide into two right angled triangles describing the relationship between the two*



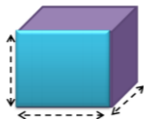
- know that the area of any triangle can be found using half the perpendicular height x base often described as the rule area = ½ x (base x height) or the formula a = $^1/_2$ bh
- investigate finding the area of parallelograms establishing that the length of the base and perpendicular height are required (found by taking a line from a vertex that meets the base at right angles)



- know that the area of a parallelogram can be found using the rule area = base x height or the formula a = bh
- solve problems related to perimeter converting between units of measure as required *e.g. What is the perimeter of a shelf unit with a length of 2.25m and a width of 150mm?*

Spring

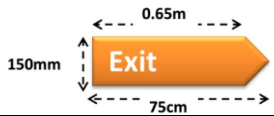
- use, read, write and convert between standard units of time *e.g. James is exactly three years old. How many days has he been alive for? How many hours has he breathed? The film was 145mins long. How long was it in hours and minutes? The DVD recorder says 14.25. What time was it six hours ago?*
- know that volume is the amount of space occupied by a three-dimensional shape
- know that the space can be measured by counting the amount of unit cubes that fit inside it
- know the common units for measuring volume is cubic centimetres cm^3 or cubic metres m^3
- recognise that a cuboid is made from multiple layers of its two dimensional face. Establish that its volume may be found by using the area of its base a = (length x width) x height



- establish that the volume of a cube or cuboid may be found using the rule volume = length x width x height
- estimate, calculate and compare the volumes of a variety of cubes to reinforce understanding of cubed numbers

1x1x1 2x2x2 3x3x3

- estimate, calculate and compare the volumes of a variety of cuboids *e.g. Investigate the volume of a variety of cubes*
- calculate the area of compound shapes to secure knowledge and rules for finding area *e.g. Calculate the area of the sign*



Summer

- secure knowledge of metric and imperial conversions extending to converting between miles and kilometres
- know that 8 kilometres is approximately equal to 5 miles; know when converting miles to kilometres to divide by 5 and multiply by 8; to convert kilometres to miles divide by 8 and then multiply by 5 *e.g. On an expedition the children hiked for 24km. What is this in miles?*
- know additional units for measuring volume are cubic kilometres km^3 and cubic millimetres mm^3 *e.g. Calculate the volume of an Oxo box and the volume of each cube*
- extend knowledge of volume to include shapes made of multiple cuboids *e.g. Ashraf is playing with his bricks. Each brick measures 7cm x 6 cm x 5cm.*

Calculate the combined volume of three bricks. The brick box contains a maximum of 12 bricks. What is the volume of the brick box?

- solve problems identifying when it is appropriate to find the area or volume of shapes *e.g. Calculate how much soil is needed to fill in a fish pond 4m long, 2.5 m wide and 2m deep. There are ten 0.4m square paving slabs. How much grass will the slabs cover?*
- apply knowledge of measures in a practical context *e.g. Design a quiet garden for the outside area with planters, paving and flowerbeds. Make a plan for a new playground including space for equipment and games painted on the tarmac surface*

AB BC MATHS

Apply knowledge to solve mathematical problems or puzzles

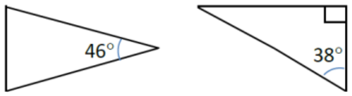
Geometry: properties of shape

Yr6 Statutory requirements

- **draw 2-D shapes using given dimensions 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 regular polygons**
- **illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius**
- **recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.**

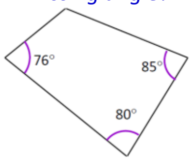
Autumn

- know the properties of all types of triangles *e.g. An equilateral triangle has 3 equal length sides, 3 equal angles of 60°, 3 lines of symmetry*
- classify a range of equilateral, isosceles, scalene and right angled triangles according to their angle and side properties e.g. Explain why a triangle can be both isosceles and right angled. If my triangle has no angles and sides the same, what sort of triangle is it?
- know that the angles in any triangle have a total of 180° (could be expressed algebraically) and use this to calculate unknown angles *e.g. What are the other two angles in this isosceles triangle? What's the missing angle in the other triangle?*



Explain how you know the angles in an equilateral triangle do not equal 90°.

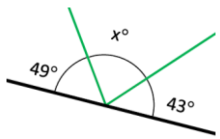
- know the properties of all types of quadrilaterals *e.g. A rhombus has 4 equal sides, 2 pairs of equal angles (opposite angles are equal), 2 pairs of parallel sides, 2 lines of symmetry and the diagonals meet at right angles*
- classify a range of quadrilaterals according to their angle and side properties
- know that the angles in any quadrilateral have a total of 360° (could be expressed algebraically) and use this to calculate unknown angles *e.g. What is the missing angle?*

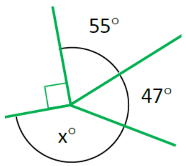


- draw 2-D shapes from given dimensions using a ruler, protractor and knowledge of the properties of the shape *e.g. Draw an equilateral triangle with sides of 5cm. Draw a parallelogram with sides of 4cm and 6cm. Draw a triangle with angles of 90°, 35° and 55°, with one side of length 5cm.*
- use mathematical conventions to mark parallel lines and right angles

Spring

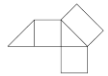
- identify and explain the circumference, diameter and radius of a circle
- know that the diameter (d) of a circle is twice its radius (r) and can be written as d=2r *e.g. What is the radius of a circle with a diameter of 23cm? If I halve the radius of a circle, what will happen to its diameter?*
- construct a circle with given dimensions using a compass and a rule *e.g. Draw a circle that has a radius of 4cm. Draw a circle with a diameter of 7cm.*
- identify angles on a straight line and know that angles on a straight line total 180°
- identify when angles meet at a point and know that angles at a point total 360°
- know that when two straight lines cross they produce vertically opposite angles *e.g.* Measure and explain the relationship between the angles when two straight lines cross
- find unknown angles *e.g.*



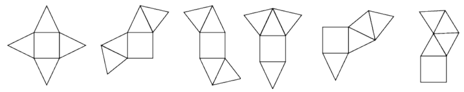


Summer

- investigate statement about shape *e.g. In a polyhedron, the number of vertices plus the number of faces equals the number of edges*
- describe a wide range of 3-D shapes using knowledge of their properties
- identify a 3-D shape from its net using knowledge of properties *e.g.* What 3-D shape is this and explain how you know

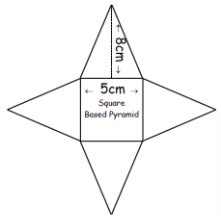


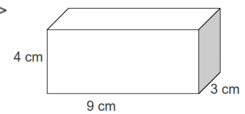
- investigate which nets will make a 3-D shape and explain why *e.g. Which nets will make a square based pyramid? Explain how you know.*



What's the same and different about the nets of a hexagonal prism and a hexagonal based pyramid?

- draw nets using rulers and protractors, in order to construct 3-D shapes *e.g. Build this square based pyramid and this cuboid*





Make a cube that has a volume of $27cm^3$

- investigate the angles inside regular polygons *e.g. Join each of the vertices of a regular shape and see how many triangles are produced. Realise that as the number of sides of the regular polygon increase by one, an additional triangle is made.*

This can lead to knowing that the interior angle of a regular polygon = 180° x (number of sides – 2)

- calculate unknown angles in regular polygons using the formula:
  angle in a regular polygon = 180°(number of sides – 2)

Apply knowledge to solve mathematical problems or puzzles

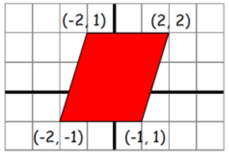
Geometry: position and direction

Yr6 Statutory requirements

- **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.**

Autumn

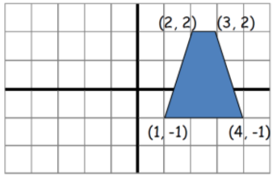
- understand the convention that (-3, -2) describes a point found by starting from the origin (0, 0) and moving three lines to the left and two lines down
- read and plot coordinates in all four quadrants *e.g. Explain how you know that (-4, 1) and (1, -4) would be in different positions on the full co-ordinate grid. Spot the mistakes with the co-ordinates.*



- plot the missing points of quadrilaterals given some of the vertices, recognising that there may be more than one solution to the problem *e.g. Three of the vertices of a rectangle are (-2, 1), (2, -4) and (2, 1). What are the co-ordinates of the fourth vertex? If (-3, - 5) and (1, -1) are two vertices of a quadrilateral. What could the other vertices be if the quadrilateral was a square? If another vertices had co-ordinates of (4, -1), what would the fourth co-ordinate need to be to make a parallelogram, an isosceles trapezium?*

Spring

- know that using negative numbers when translating means you move the shape left or down *e.g. 2 to the left is recorded as -2 horizontally and 2 down would be recorded -2 vertically*
- draw and translate simple shapes in all four quadrants *e.g. Plot the vertices of a triangle (-2, 4), (-2, -3) and (3, -3), then translate it -3 horizontally and -2 vertically. What are the co-ordinates of the translated shape?*
- recognise and describe the translation used to move a point or shape from one position to another *e.g. From (-2, -6) to (-5, -1) as -3 horizontally and 5 vertically*
- draw and reflect simple shapes in the axes of the co-ordinate plane (grid) *e.g. What are the co-ordinates of the trapezium if its reflected in the y-axis?*



Draw a parallelogram with co-ordinates of (-3, 2), (-1,5), (5, 5) and (3, 2) and reflect it in the x-axis. What are the co-ordinates of the new shape?

- identify the axes of reflection from the original and reflected co-ordinates *e.g. If a point starts at (-3,5) and is reflected to (3, 5), which axes has it been reflected in?*

Summer

Apply knowledge to solve mathematical problems or puzzles

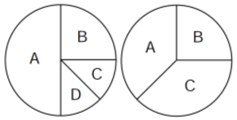
Statistics

Yr6 Statutory requirements

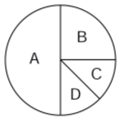
- **interpret and construct pie charts and line graphs and use these to solve problems**
- **calculate and interpret the mean as an average.**

Autumn

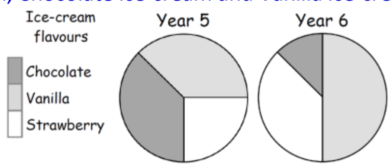
- know that a pie chart is a way of recording proportion
- know the circle represents all the data and that the sizes of sectors of the chart represent the proportions in each category
- know that some pie charts use a key to show the categories represented
- interpret simple pie charts making links with fractions, decimals, percentages *e.g. What fraction, percentage does A , B, C, D represent in each pie chart?*



- calculate amounts from simple pie charts *e.g. If the pie chart represents 80 children who choose one of 4 drinks. How many children like each drink?*



- compare the results shown on two pie charts related to the same topic but based on different totals *e.g.* There are 32 children in Year 5 and 24 in Year 6. Which class has the most children who like Strawberry ice-cream, Chocolate ice-cream and Vanilla ice-cream?



- interpret pie charts from real life and draw conclusions *e.g. Compare the nutritional information for 100g of various breakfast cereals and approximate what fraction/percentage of the cereal is fibre?*
- generate simple pie charts using data handling programs
- solve problems using pie charts reinforcing fractions and percentages

Spring

- know that mean is a form of finding the average
- explain how to calculate the mean of a set of data *e.g. The sum of the values, divided by the total number of values*
- calculate the mean from a given set of data *e.g. What's the mean average price for a bar of chocolate if five different shops sell them for 55p, 34p, 42p, 48p, 51p? The Come Dancing judges give scores of 8, 6, 8 and 7. What is the mean average score?*
- solve problems using knowledge of how the mean is calculated *e.g. Phil has these four cards 1, 8, 5, 2. The mean is 4. Phil takes another card. The mean of the five cards is still 4.What number is on his new card? A competition has three different games. Jane has played two of the games and got scores of 62 and 53. To win, Jane needs a mean score of 60. How many points does she need to score in game C?*

- secure understanding of interpreting pie charts
- construct a pie chart from a set of given data using knowledge that there are 360° in a full circle *e.g. Use a protractor to draw a pie chart based on data.*

DVDs borrowed from the library

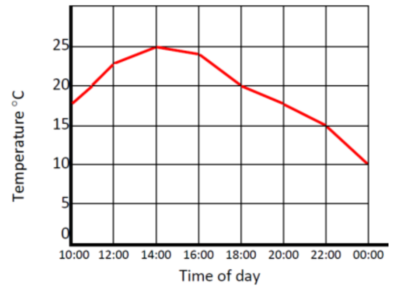
Comedy	Action	Romance	Drama	Sci Fi
6	4	4	1	5

Visitors to the school library

Day	Mon	Tues	Wed	Thurs	Fri
Visitors	12	15	20	17	26

Summer

- know that all line graphs should have a title and that each axis should have an appropriate scale and should be clearly labelled
- construct and interpret a line graph, in which intermediate values have meaning *e.g. Construct a line graph that can be used to convert miles to kilometre. Find out how many miles is equivalent to 3km and how many km are equivalent to 7 miles?*
- solve problems involving line graphs *e.g. The temperature in a room at a certain time*



When was the temperature in the room 20℃? What was the temperature at 1:00 pm? What was the temperature change between 2 o'clock and 4 o'clock? Is it true that the hottest part of the day was at noon?

- draw line graphs based on their own experiences and experiments *e.g. In Science*

AB BC MATHS

Where possible use meaningful data and experiences from across the curriculum