

	Autumn	Spring	Summer
Number & place value 1 week	- Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit <i>e.g. order a set of multi-digit numbers from smallest to largest - 37 700, 737 570, 737 507, 37 570</i> <i>What is the smallest integer you can make using all of these digits: 8, 1, 0, 5, 6?</i> - Count forwards or backwards in steps of powers of 10 from any given number up to 1 000 000 <i>e.g. 197 000, 198 000, 199 000, 200 000, 201 000...</i> - Round any number up to 1 000 000 to the nearest 10, 100 and 1000 <i>e.g. 265 946 to the nearest 1000 (266 000)</i> - Solve number problems and practical problems that involve number, place value and rounding <i>e.g. What number is halfway between 560 500 and 560 600? What is the largest 4-digit number whose digits sum to 20? (9920).</i>	- Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit - Count forwards or backwards in steps of powers of 10 from any given number up to 1 000 000 - Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero <i>e.g. count back in threes: 8, 5, 2, -1, -4, -7...</i> - Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 - Solve number problems and practical problems that involve number, place value and rounding <i>The distance to the bus stop is 1km to the nearest 100m; what is the shortest distance it could be?</i>	- Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit <i>e.g. What must be added to 37 500 to change it to 67 500?</i> - Count forwards or backwards in steps of powers of 10 from any given number up to 1 000 000 - Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero - Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 - Solve number problems and practical problems that involve number, place value and rounding. - Read Roman numerals to 1000 (M) and recognise years written in Roman numerals. <i>e.g. MCMXIV (1914)</i>

Addition & Subtraction 2 weeks	• Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • Add and subtract numbers mentally with increasingly large numbers <i>e.g. $15\,400 - 2000 = 13\,400$</i> • Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why <i>e.g. I have read 124 of the 526 pages of my book; how many more pages must I read to reach the middle?</i>	• Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • Add and subtract numbers mentally with increasingly large numbers • Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why <i>e.g. I bought some stickers on Monday; on Tuesday I bought 20 more than I bought on Monday; now I have 70; how many stickers did I buy on Monday?</i>	• Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • Add and subtract numbers mentally with increasingly large numbers <i>e.g. $12\,462 - 2\,300 = 10\,162$</i> • Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why <i>e.g. Write a number story for this number sentence: $3709 = 4562 + 234 - 1087$</i>
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Multiplication & Division

2/3 weeks

- Continue to practise and apply multiplication tables and related division facts, committing them to memory and using them confidently to make larger calculations
- Identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers
- Know and use the vocabulary of prime numbers and composite (non-prime) numbers
- Establish whether a number up to 100 is prime and recall prime numbers up to 19
- Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
- Multiply and divide numbers mentally drawing upon known facts
- Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 e.g. $456 \div 100 = 4.56$
- Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign e.g. $40 \times 8 = 500 - \square$

- Identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers
- Know and use the vocabulary of prime numbers and composite (non-prime) numbers
- Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
- Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context e.g. $98 \div 4 = 24 \text{ r } 2 = 24\frac{1}{2} = 24.5 \approx 25$.
- Recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)
- Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign e.g. *There are 6 shelves of books; 3 shelves hold 35 books each, one shelf holds 45 books and the top two shelves have the same number of books on each; there are 200 books altogether; how many books are on the very top shelf?*

- Identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers
- Solve problems involving multiplication and division where larger numbers are used by decomposing them into their factors e.g. $828 \div 36 = (828 \div 4) \div 9 = 207 \div 9 = 23$
- Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers e.g. *prime factors of 60 = $2 \times 2 \times 3 \times 5$*
- Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
- Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context
- Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates e.g. *a toymaker can make 8 toys in 2 hours; how many toys can he make in 5 hours?*

A 1 m piece of ribbon is cut into equal pieces and a piece measuring 4 cm remains. What might the lengths of the equal parts be? In how many different ways can the ribbon be cut into equal pieces?



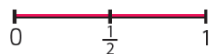
Fractions (including decimals and percentages)

3 weeks

- Compare and order fractions whose denominators are all multiples of the same number

put these fractions in order from the smallest:
 $\frac{5}{12}, \frac{5}{6}, \frac{11}{12}, \frac{2}{3}$

Mark and label on this number line where you estimate that $\frac{3}{4}$ and $\frac{3}{8}$ are positioned.



- Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths *making links to decimals and measures* e.g. $\frac{37}{100}$ metre = 0.37m, $\frac{755}{1000}$ kg = 0.755kg
- Read and write decimal numbers as fractions e.g. $0.71 = \frac{71}{100}$
- Recognise the per cent symbol (%) and understand that per cent relates to "number of parts per hundred", and write percentages as a fraction with denominator hundred, and as a decimal fraction e.g. $43\% = \frac{43}{100} = 0.43$
- Solve problems involving number up to three decimal places,
- Recognise the per cent symbol (%) and understand that per cent relates to "number of parts per hundred", and write percentages as a fraction with denominator hundred, and as a decimal fraction
- Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those with a denominator of a multiple of 10 or 25.

e.g. $\frac{12}{20} = \frac{60}{100} = 0.6 = 60\%$

Jack and Jill each go out shopping. Jack spends $\frac{1}{4}$ of his money. Jill spends 20% of her money. Frank says Jack spent more because $\frac{1}{4}$ is greater than 20%. Alice says you cannot tell who spent more. Who do you agree with, Frank or Alice? Explain why.

- Read and write decimal numbers as fractions (e.g. $0.71 = \frac{71}{100}$)

- Compare and order fractions whose denominators are all multiples of the same number

- Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths *making links to decimals and measures*

- Recognise mixed numbers and improper fractions and convert from one form to the other e.g. $5\frac{2}{3} = \frac{17}{3}$ and write mathematical statements >1 as a mixed number e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$

- Add and subtract fractions with the same denominator and multiples of the same number e.g. $\frac{2}{3} + \frac{1}{6} = \frac{5}{6}$
 $\frac{2}{5} + \frac{7}{10} = \frac{11}{10} = 1\frac{1}{10}$

- Find fractions of numbers and quantities e.g. $\frac{3}{4}$ of £14, $\frac{3}{8}$ of 408

- Add and subtract decimals with a different number of decimal places e.g. $102.3 + 97.82$

- Round decimals with two decimal places to the nearest whole number and to one decimal place e.g. $27.59 = 27.6$ (1 d.p.)

- Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents e.g. $\frac{650}{1000} = \frac{65}{100} = 0.65$;

- Read, write, order and compare numbers with up to three decimal places e.g. *put these decimals in order starting from the smallest:* 0.457, 0.42, 0.46, 0.426

Compare and order fractions whose denominators are all multiples of the same number

Which is closer to 1? $\frac{7}{8}$ or $\frac{23}{24}$

- Recognise mixed numbers and improper fractions and convert from one form to the other e.g. $5\frac{2}{3} = \frac{17}{3}$ and write mathematical statements >1 as a mixed number
- Add and subtract fractions with the same denominator and multiples of the same number
- Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. e.g. $\frac{2}{5} \times 3 = \frac{6}{5} = \frac{8}{5} = 1\frac{3}{5}$
- Read and write decimal numbers as fractions e.g. $0.8 = \frac{4}{5}$
- Add and subtract decimals with a different number of decimal places e.g. $98.4 - 9.7$
- Round decimals with two decimal places to the nearest whole number and to one decimal place
- Read, write, order and compare numbers with up to three decimal places e.g. *put these decimals in order starting from the smallest:* 0.471, 0.46, 0.4, 0.465, 0.5
- Solve problems and puzzles involving number up to three decimal places, *checking the reasonableness of answers*
- Recognise the per cent symbol (%) and understand that per cent relates to "number of parts per hundred", and write percentages as a fraction with denominator hundred, and as a decimal fraction
- Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those with a denominator of a multiple of 10 or 25. e.g. *John ate $\frac{4}{5}$ of a 20cm jelly snake; Jane ate 0.7 of her 20cm jelly snake; how much more has John eaten?*

Measurement

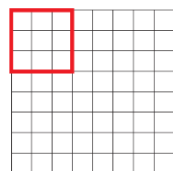
1 week

- Convert between different units of measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) e.g. $15.7\text{cm} = 157\text{mm}$, e.g. $3.7\text{ litres} = 3700\text{ml}$, $2.2\text{m} = 2200\text{mm}$

- Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres

e.g. find the perimeter of an L shape where one or two side lengths are not given

Here is a picture of a square drawn on cm² paper.



Draw another rectangle with the same perimeter as this square. Do the two rectangles have the same area? Is this always, sometimes or never true of other pairs of rectangles with the same perimeter? Explain your reasoning.

- Use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling

A 1.2 m ribbon and a 90 cm ribbon are joined by overlapping the ends and gluing them together. The total length of ribbon needs to be 195 cm long. How much should the two pieces overlap?



- Estimate volume e.g. using 1cm^3 blocks to build cubes and cuboids and capacity e.g. using water
- Solve problems involving converting between units of time e.g. write these lengths of time in order, starting with the smallest: 250sec , 90min , $\frac{1}{2}\text{ hour}$, 4min

- Convert between different units of measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)

True or false?

$$1.5\text{ kg} + 600\text{ g} = 2.1\text{ kg} + 300\text{ g}$$

$$32\text{ cm} + 1.05\text{ m} = 150\text{ cm} - 0.13\text{ m}$$

$$\frac{3}{4}\text{ L} + 0.05\text{ L} = \text{half of } 1.6\text{ L}$$

Explain your reasoning

- Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres
- Calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes
- Use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling
- Understand and use equivalences between metric and common imperial units such as inches, pounds and pints e.g. Given that an inch is approximately 2.5cm , calculate the metric equivalent of a foot (12 inches)

- Convert between different units of measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) e.g.

- Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres

- Calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes e.g. investigate possible rectangles with the same area as a particular square

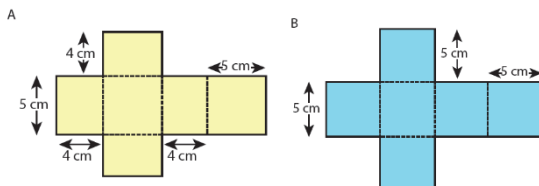
- Estimate volume e.g. using 1cm^3 blocks to build cubes and cuboids and capacity e.g. using water
- Solve problems involving converting between units of time e.g. three children share a trophy for 8 weeks and 4 days; they each have it for the same length of time; how long does each child keep the trophy?
- Use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling

Geometry

1 week

- Identify 3-D shapes, including cubes and other cuboids, from 2-D representations

What shapes do you make when these 2-D representations (nets) are cut out and folded up to make 3-D shapes?



- Draw lines accurately to the nearest millimetre and use conventional markings for parallel lines and right angles.
- Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
- Use the properties of rectangles to deduce related facts and find missing lengths and angles *e.g. all angles are right angles, diagonals are congruent (same length) and bisect each other (divide into two equal parts), one diagonal separates the rectangle into two congruent triangles...*

- Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
- Draw given angles, and measure them in degrees ($^{\circ}$)
- Identify:
 - angles at a point and one whole turn (total 360°)
 - angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°)
 - other multiples of 90°
- Use angle sum facts and other properties to make deductions about missing angles
- Use the properties of rectangles to deduce related facts and find missing lengths and angles
- Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.

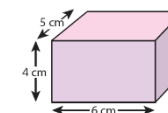
e.g. sort triangles and quadrilaterals into regular and irregular sets, realising that only the equilateral triangles and the squares are regular

Identify the regular and irregular quadrilaterals.

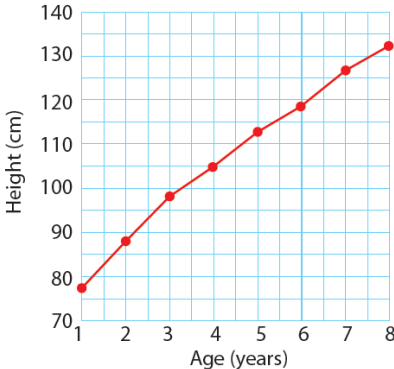


- Identify 3-D shapes, including cubes and other cuboids, from 2-D representations

Draw the 2-D representation (net) that will make this cuboid when cut out and folded up.



- Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
- Draw given angles, and measure them in degrees ($^{\circ}$)
- Identify:
 - angles at a point and one whole turn (total 360°)
 - angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°)
 - other multiples of 90°
- Use angle sum facts and other properties to make deductions about missing angles
- Use the properties of rectangles to deduce related facts and find missing lengths and angles

Position & Direction	Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed. A square is translated 3 squares down and one square to the right. Three of the coordinates of the translated square are: (3, 6) (8, 11) (8, 6) What are the co-ordinates of the original square?	Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.	Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed. Two triangles have the following co-ordinates: Triangle A: (3, 5) (7, 5) (4, 7) Triangle B: (3, 1) (7, 1) (4, 3) Describe the translation of triangle A to B and then from B to A.																																																																										
Statistics 1 week	Complete, read and interpret information in tables, including timetables. <table><tr><td></td><td colspan="6">Bus Timetable</td></tr><tr><td>Highway Rd</td><td>06:50</td><td></td><td>07:25</td><td>08:45</td><td>09:10</td><td>09:45</td></tr><tr><td>Rain Rd</td><td>07:00</td><td>07:25</td><td>07:41</td><td>08:55</td><td>09:19</td><td>09:53</td></tr><tr><td>Coldcot Rd</td><td>07:11</td><td>07:41</td><td>07:51</td><td>09:04</td><td>09:28</td><td>10:02</td></tr><tr><td>Westland Rd</td><td>07:18</td><td>07:59</td><td>07:59</td><td>09:11</td><td>09:38</td><td>10:11</td></tr><tr><td>Bod Rd</td><td>07:29</td><td>08:12</td><td>08:09</td><td>09:16</td><td>09:47</td><td>10:16</td></tr><tr><td>Kingswell Rd</td><td>07:33</td><td>08:15</td><td>08:14</td><td>09:20</td><td>09:53</td><td>10:21</td></tr><tr><td>Long Rd</td><td>07:45</td><td>08:30</td><td>08:30</td><td></td><td>10:05</td><td>10:40</td></tr></table> Use the bus timetable to answer the following questions: On the 6:50 bus how long does it take to get from Highway Rd to Westland Rd? Can you travel to Long Rd on the 8:45 bus? Which journey between Rain Rd and Kingswell Rd takes the longest time, the bus that leaves Rain Rd at 7:25 or the bus that leaves Rain Rd at 7:41?		Bus Timetable						Highway Rd	06:50		07:25	08:45	09:10	09:45	Rain Rd	07:00	07:25	07:41	08:55	09:19	09:53	Coldcot Rd	07:11	07:41	07:51	09:04	09:28	10:02	Westland Rd	07:18	07:59	07:59	09:11	09:38	10:11	Bod Rd	07:29	08:12	08:09	09:16	09:47	10:16	Kingswell Rd	07:33	08:15	08:14	09:20	09:53	10:21	Long Rd	07:45	08:30	08:30		10:05	10:40	- Complete, read and interpret information in tables, including timetables. Use the line graph to answer the following questions: From the graph can you predict the approximate height of an average 10 year old? Explain how. The growth of children between the ages of 1 and 8 <table><tr><th>Age (years)</th><th>Height (cm)</th></tr><tr><td>1</td><td>78</td></tr><tr><td>2</td><td>88</td></tr><tr><td>3</td><td>98</td></tr><tr><td>4</td><td>105</td></tr><tr><td>5</td><td>113</td></tr><tr><td>6</td><td>120</td></tr><tr><td>7</td><td>128</td></tr><tr><td>8</td><td>133</td></tr></table> - Solve comparison, sum and difference problems using information presented in a line graph e.g. on a distance-time graph, how long did it take to travel a particular distance?	Age (years)	Height (cm)	1	78	2	88	3	98	4	105	5	113	6	120	7	128	8	133	- Complete, read and interpret information in tables, including timetables. - Solve comparison, sum and difference problems using information presented in line graphs
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