BROOMFIELD PRIMARY SCHOOL

# Maths Progression Document

| | Early Years Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| **Place value** (decimal place value covered in fractions section) | | | | | | | |
| Place Value: Counting | • **Count** an irregular arrangement of up to 10 objects **(subitising)**<br>• **Count** with numbers **from 1 to 20**, place **in order** | • Count to and across 100, forwards and backwards, beginning with 0 or 1, or from a given number<br>• Count numbers to 100 in numerals; count int multiples of twos fives and tens | • Count in steps of 2,3 and 5 from 0, and in tens from any number, forward or backward | • Count from 0 in multiples of 4,8, 50 and 100; find 10 or 100 more or less than a given number | • Count in multiples of 6,7,9,25 and 1000<br>• Count backwards through zero to include negative numbers | • Count forwards or backwards in steps of powers of 10 for any given number up to 10 000 000<br>• Count forwards and backwards with positive and negative whole numbers, including through zero | |
| Place value: represent | • Recognise **numerals 1 to 20**<br>• Read and write numbers from **1 to 10 in numerals**<br>• Represent the correct numeral for 1 to 10 objects | • Identify and represent numbers using objects and practical representations<br>• Read and write numerals to 100 in numerals<br>• Read and write numbers from 1 to 20 in numerals and words | • Read and write numbers to at least 100 in numerals and words<br>• Identify, represent and estimate numbers using different representations, including the number line | • Identify, represent and estimate numbers using different representations<br>• Read and write numbers up to 1000 in numerals and in words | • Identify, represent and estimate numbers using different representations<br>• Read Roman numerals up to 100 (I to C) and know that over time, the numerals system changed to include the concept of zero and place value | • Read, write (order and compare) numbers to 1 000 000 and determine the value of each digit<br>• Read roman numerals to 1000 (M) and recognise years written in Roman numerals | • Read, write (order and compare) numbers up to 10 000 000 and determine the value of each digit |

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| Place value: Use PV & compare | • Say the number **one more than** a given number<br>• Find **one more or less** from a group of up to 10 objects | • Given a number, identify one more and one less | • Recognise the place value of each digit in a two-digit number (tens, ones)<br>• Compare and order numbers from 0 up to 100; use <, > and = signs | • Recognise the place value of each digit in a three-digit number (hundreds, tens, ones)<br>• Compare and order numbers up to 1000 | • Find 1000 more or less than a given number<br>• Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens and ones)<br>• Order and compare numbers beyond 1000 | • (read, write) order and compare numbers to at least 1 000 000 and determine the value of each digit | • (read, write), order and compare numbers up to 10 000 000 and determine the value of each digit |
| Place value: Problems and rounding | | | • Use place value and number facts to solve problems | • Solve problems and practical problems involving these ideas | • Round any number to the nearest 10, 100 or 1000<br>• Solve number and practical problems that involve all of the above and with increasingly large positive numbers | • Interpret negative numbers in context<br>• Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000<br>• Solve number problems and practical problems that involve all of the above | • Round any whole number to a required degree of accuracy<br>• Use negative numbers in context, and calculate intervals across zero<br>Solve number problems that involve all of the above |

# Addition and subtraction

| | Early Years Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| Addition and Subtraction: Recall, Represent, Use | In practical activities and discussion, begin to use the vocabulary involved in **adding and subtracting (add/plus/increase by/more; subtract/take/ decrease/less)**<br><br>Record, using marks that they can interpret and explain<br>ELG - using quantities | • Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs<br>• Represent and use number bonds and related subtraction facts within 20 | • Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100<br>• Show that addition of two numbers can be done in any order (commutative) and subtraction of | • Estimate the answer to a calculation and use inverse operations to check answers | • Estimate and use inverse operations to check answers to a calculation | • Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy | • |

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| | and objects, they add and subtract two **single-digit numbers** and **count on or back** to find the answer<br><br>Begin to identify their own mathematical problems based on own interests and fascinations | | one number from another cannot<br>• Recognize and use the relationship between addition and subtraction and use this to check calculations and solve missing number problems | | | | |
| Addition & subtraction: Calculations | | • Add and subtract one-digit and two-digit numbers to 20, including 0 | • Add and subtract numbers using concrete objects, pictorial representations and mentally, including:<br><br>- a two-digit number and ones<br><br>- a two-digit number and tens<br><br>- two two-digit numbers<br><br>- adding three one-digit numbers | • add and subtract numbers mentally, including:<br><br>- a three-digit number and ones<br>- a three -digit number and tens<br>- a three-digit number and hundreds<br><br>• add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction | • add and subtract numbers with up to 4 digits using the formal written method of columnar addition and subtraction where appropriate | • Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)<br>• Add and subtract numbers mentally with increasingly large numbers | • Perform mental calculations, including with mixed operations and large numbers<br>• Use their knowledgeof the order of operations to carry our calculations involving the four operations |
| Addition and subtraction: Solve problems | | • Solve on-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems, such as 7 = ☐ - 9 | • Solve problems with addition and subtraction:<br>- Using concrete objects and pictorial representations, including those involving numbers, quantities and measures<br>- Applying their increasing knowledge of mental and written methods | • Solve problems including missing number problems, using number facts, place value and more complex addition and subtraction | • Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why | • Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why<br>• Solve problems, including addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign. | • Solve addition and subtraction multi-step problems in contexts, decising which operations and methods to use and why |

# Multiplication and Division

| | Early Years Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| Multiplication and Division: Recall, Represent, Use | ELG – solve problems, including **doubling, halving and sharing** | *Counting in steps of 2, 5 and 10 from 0* | • Recall and use multiplication facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers<br>• Show that the multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot | • Recall and use multiplication and division facts for the 3, 4 and 5 multiplication tables | • Recall multiplication and division facts for multiplication tables up to 12 x 12<br>• Use place value, known and derived facts to multiply and divide mentally, including multiplying by 0 and 1; dividing by 1; multiplying together three numbers<br>• Recognize and use factor pairs and commutativity in mental calculations | • Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers<br>• Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers<br>• establish whether a number up to 100 is prime and recall prime numbers up to 20<br>• Recognise and use square numbers and cube numbers, and the notation for squared and cubed | • Identify common factors, common multiples and prime numbers<br>• Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy |
| Multiplication and Division: Calculations | | | • Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication, division and equals signs | • Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one digit numbers using mental and progressing to formal written methods | • Multiply two-digit and three-digit numbers by a one-digit number using formal written methods | • Multiply numbers up to 4 digits by a one-digit number using a written formal method, including long multiplication for two-digit numbers<br>• Multiply and divide numbers mentally, drawing upon known facts<br>• Divide numbers up to 4 digits by a one-digit number | • Multiply multi-digit numbers up to 4 digits by a two-digit number using the formal written method of long multiplication<br>• Divide numbers up to 4 digits by a two-digit number using the formal written method of long division, and interpret the remainders as whole number remainders, fractions, or by rounding as appropriate to context<br>• Divide numbers up to 4 digits by a two-digit number using |

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| | | | | | | using the formal written method of short division and interpret remainders appropriately for the context<br>• Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 | the format written method of short division where appropriate, interpreting remainders according to the context<br>• Perform mental calculations, including with mixed operations and large numbers |
| Multiplication and Division: Solve Problems | | • Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher | • Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in context | • Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects | • Solve problems involving multiplying and adding, using the distributive law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects | • Solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes<br>• Solve problems involving multiplication and division, including scaling by simple fraction and problems involving simple rates | • Solve problems involving addition, subtraction, multiplication and division |
| Multiplication and division: Combined | | | | | | • Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign | • Use their knowledge of the order of operations to carry out calculations involving the four operations |

# Fractions, Decimals and Percentages

| | Early Years Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| Fractions: Calculations | | | • Write simple fractions for example ½ of 6 = 3 | • Add and subtract fractions with the same denominator within one whole (for example 5/7 + 1/7 = 6/7) | • Add and subtraction fractions with the same denominator | • Add and subtract fractions with the same denominator and denominators that are multiples of the same number<br>• Multiply proper fractions and mixed numbers by whole numbers supported by materials and diagrams | • Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions<br>• Multiply simple pairs of proper fractions, writing the andwer in its simplest form (for example ¼ x ½ = 1/8 )<br>• Divide proper fractions by whole numbers (for example, 1/3 divided by 2 = 1/6) |
| Fractions: Solve Problems | | | | • Solve problems that involve all of the above | • Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number | | |
| Decimals: Recognise and write | | | | | • Recognize and write decimal equivalents of any number of tenths or hundredths<br>• Recognize and write decimal equivalents to ¼, ½, ¾ | • Read and write decimal numbers as fractions (for example, 0.71 = 71/100)<br>• Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents | • Identify the value of each digit in numbers given to three decimal places |

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| Decimals: Compare | | | | | • Round decimals with one decimal place to the nearest whole number<br>• Compare numbers with the same number of decimal places up to two decimal places | • Round decimals with two decimal places to the nearest whole number and to one decimal place<br>• Read, write, order and compare numbers with up to three decimal places | |
| Decimals: Calculations and | | | | | • Find the effect of dividing a one or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths | • Solve problems involving numbers with up to three decimal places | • Multiply and divide numbers by 10, 100 and 1000 giving answer up to three decimal places<br>• Multiply one-digit numbers with up to two decimal places by whole numbers<br>• Use written division methods in cases where the answer has up to two decimal places<br>• Solve problems which require answers to be rounded to specified degrees of accuracy |
| Fractions, Decimals and Percentages | | | | | • Solve simple measure and money problems involving fractions and decimals to two decimal places | • Recognise the percent symbol (%) and understand that percent relates to 'number of parts per hundred' and write percentages as a fraction with the denominator 100, and as a decimal<br>• Solve problems which require knowing percentage and decimal equivalents of 1/2., ¼, 1/5, 2/5, 3/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25 | • Associate a fraction with division and calculate decimal fraction equivalents (for example 0.375) for a simple fraction (for example 3/8)<br>• Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts |

# Ratio and Proportion

| | Early Years Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| Ratio and Proportion | | | | | • | • | • Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts<br>• Solve problems involving the calculation of percentages (for example, of measures and such as 15% of 360) and the use of percentages for comparison<br>• Solve problems involving similar shapes where the scale factor is known or can be found<br>• solve problems involving unequal sharing and grouping using knowledge of fractions and multiples |

# Algebra

*Links to other units in italics*

| | Early Years Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| Algebra | | • *Solve one-step problems that involve **addition and subtraction,** using concrete objects and pictorial representations, and missing number problems, such as 7 = ☐ - 9* | • *Recognise and use the relationship between **addition and subtraction** and use this to check calculations and solve missing number problems* | • *Solve problems including missing number problems* | • | • | • Use simple formulae<br>• Generate and describe linear number sequences<br>• Express missing number problems algebraically<br>• Find pairs of numbers that satisfy and equation with two unknowns<br>• Enumerate possibilities of combintona of two variables |

# Measurement

| | Early Years Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| Measurement: Using Measures | Explore and compare capacity of different containers and use language of **more, less, full, half-full, empty** to describe these<br><br>Order two or three items by **length** or **height**<br><br>Order two items by **weight** or **capacity** | • Compare, describe and solve practical problems for:<br>- Lengths and heights (for example long/short, longer/shorter, tall/short, double/half)<br>- Mass/weight (for example, heavy/light, heavier than, lighter than<br>- Capacity and volume (for example, full/empty, more than/less than, half, half full, quarter)<br>- Time (for example, quicker/slower, earlier, later)<br>• Measure and begin to record the following:<br>- Length and heights<br>- Mass/weight<br>- Capacity and volume<br>- Time (hours, minutes, seconds) | • Choose and use appropriate standard units to measure and estimate lengths/height in any direction (m/cm/mm); mass (kg/g); temperature (degrees C); capacity (l, ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels<br>• Compare and order lengths, mass, volume/capacity and record the results using >,< and = | • Measure, compare, add and subtract; lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) | • Convert between different measures of units of measure (for example km to m; hour to minute)<br>• Estimate, compare and calculate different measures | • Convert between different measures of metric measure (for example, km and m; cm and m; cm and mm; g and kg; l and ml)<br>• Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints<br>• Use all four operations to solve problems involving measure using decimal notation, including scaling | • Solve problems involving the calculationand conversion of units of measure, using decimal notationup to three decimal places where appropriate<br>• Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller to a larger unite and vice versa, using decimal notation to up to three decimal places<br>• Convert between miles and kilometres |
| Measurement: Using | | • Recognise and know the value of different denominations of coins and notes | • Recognize and use symbols for pounds (£) and pence (p); combine amounts to make a particular value<br>• Find different combinations of | • Add and subtract amounts of money to give change, using both £ and p in practical contexts | • Estimate, compare and calculate different measures, including money in pounds and pence | • Use all four operations to solve problems involving measure (for example, money) | |

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| | | | coins that equal the same amounts of money<br>• Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change | | | | |
| Measurement: Time | **Measure** short periods of time in simple ways<br>ELG - Use **everyday language** to talk about **time** | • Sequence events in chronological order using language (for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening)<br>• Recognise and use language relating to dates, including days of the week, weeks, months and years<br>• Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times | • Compare and sequence intervals of time<br>• Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times<br>• Know the number of minutes in an hour and the number of hours in a day | • Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks<br>• Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, am/pm, morning, afternoon, noon, midnight<br>• Know the number of seconds in a minute and the number of days in each month, year and leap year<br>• Compare durations of events (for example to compare the length of time taken by particular events and tasks) | • Read, write and convert time between analogue and digital 12- and 24-hour clocks<br>• Solve problems involving converting from hours to minutes; minutes to second; years to months; weeks to days | • Solve problems involving converting between units of time | • Use, read and write and concert between standard units, converting measurements of time from a smaller unit of measure to a larger unit and vice versa |

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| Measurement: Perimeter, Area, Volume | | | | • Measure the perimeter of simple 2D shapes | • measure and calculate the perimeter of a rectilinear figure (including squares) in cm and m<br>• find the area of rectilinear shapes by counting squares | • measure and calculate the perimeter of composite rectilinear shapes in cm and m<br>• calculate and compare the area of rectangles (including squares), and including using standard units (cm2) and square metres (m2) and estimate the area of irregular shapes<br>• estimate volume (for example using 1cm3 blocks to build cuboids including cubes) and capacity (for example, using water) | • recognize that shapes with the same areas can have different perimeters and vice versa<br>• recognize when it is possible to use formulae for area and volume of shapes<br>• calculate the area of parallelograms and triangles<br>• calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic cm (cm3) and cubic metres (m3) and extending to other units (for example mm3 and km3) |

# Geometry

*See also area and perimeter in measurement unit*

| | Early Years Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| Geometry: 2D Shapes | ELG - explore characteristics of everyday objects and shapes and use mathematical language to describe them<br><br>Use familiar objects and common shapes to create and recreate **patterns** and build **models** | • recognise and name common 2D shapes (for example, rectangles (including squares), circles and triangles) | • identify and describe the properties of 2D shapes, including the number of sides and line symmetry in a vertical line<br>• identify 2D shapes on the surface of a 3D shape (for example, a circle on a cylinder and a | • draw 2D shapes | • compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes<br>• identify lines of symmetry in 2D shapes presented in different orientations | • distinguish between regular and irregular polygons based on reasoning about equal sides and angles<br>• use the properties of rectangles to deduce related facts and find missing lengths and angles | • draw 2D shapes using given dimensions and angles<br>• compare and classify geometric shapes based on their properties and sizes<br>• illustrate and name parts of circles, including radius and diameter and circumference and know that the diameter is twice the radius. |

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| | Begin to use mathematical names for **'solid' 3D shapes** and **'flat' 2D shapes**, and mathematical terms to describe shapes | | triangle on a pyramid)<br>• compare and sort common 2D shapes and everyday objects | | | | |
| Geometry: 3D Shapes | | • recognise and name common 3D shapes (for example cuboids (including cubes), pyramids and spheres) | • Recognise and name common 3D shapes (for example, cuboids (including cubes), pyramids and spheres)<br>• Compare and sort common 3D shapes and everyday objects | • Make 3D shapes using modelling materials; recognize 3D shapes in different orientations and describe them | • | • Identify 3D shapes including cubes and other cuboids from 2D representations | • Recognize, describe and build simple 3D shapes, including making nets |
| Geometry: Angles and Lines | | | | • Recognize angles as a property or shape or a description of a turn<br>• Identify right angles, recognize that two right angles make a half turn, three make three quarters of a turn and 4 a complete turn; identify whether angles are greater or less than a right angle<br>• Identify horizontal and vertical lines and pairs of perpendicular and parallel lines | • Identify acute and obtuse angles and compare and order angles up to two right angles by size<br>• Identify lines of symmetry in 2D shapes presented in different orientations<br>• Complete a simple symmetric figure with respect to a specific line of symmetry | • Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles<br>• Draw given angles and measure them in degrees<br>• Identify:<br>- Angles at a point and one whole turn<br>- Angles at a point on a straight line and ½ a turn<br>- Other multiples of 90 degrees | • Find unknown angles in any triangles, quadrilaterals and regular polygons<br>• Recognize angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles |
| Geometry: Position and | Use a wider vocabulary to describe relative positions of themselves and objects<br>ELG - recognise, create and describe **patterns** | • Describe position, direction and movement, including whole, half, quarter and three-quarter turns | • Order and arrange combinations of mathematical objects in patterns and sequences<br>• Use mathematical vocabulary to describe position, direction and | | • Describe positions on a 2D grid as coordinates in the first quadrant<br>• Describe movement between positions as translations of a given unit to the | • Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the | • Describe positions on the full coordinate grid (all four quadrants0<br>• Draw and translate simple shapes on the coordinate plane, and reflect them in the axes |

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| | | | movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise) | | • left/right and up/down<br>• Plot specified points and draw sides to complete a given polygon | shape has not changed | |

| Statistics | | | | | | | |
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| | Early Years Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Statistics: Present and | | | • Interpret and construct simple pictograms, tally charts, block diagrams and simple tables | • Interpret and present data sing bar charts, pictograms and tables | • Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs | • Complete, read and interpret information in tables, including timetables | • Interpret and construct pie charts and line graphs and use these to solve problems |
| Statistics: Solve Problems | | | • Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity<br>• Ask and answer questions about totaling and comparing categorical data | • Solve on-step and two-step questions (for example 'How many more?' and 'How many fewer?') using information in scaled bar charts and pictograms and tables | • Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs | • Solve comparison, sum and difference problems using information presented in a line graph | • Calculate and interpret the mean as an average |