St John's
Church of England
Academy

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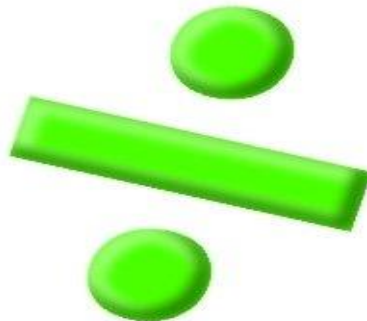
Durham &
Newcastle
Diocesan
Learning
Trust

Complete progression of skills and knowledge in Mathematics
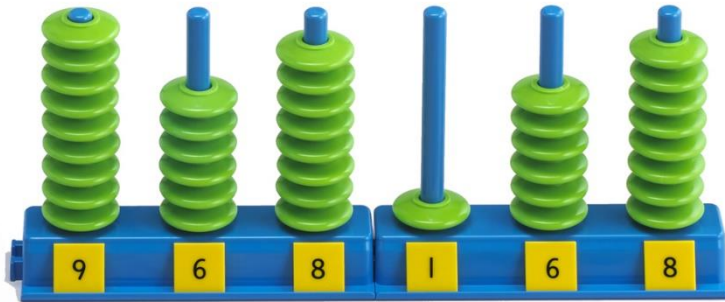Years 1 - 6

Contents

Progression in Place Value

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place Value Counting	Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number. Count in numbers to 100 in numerals; count in multiples of twos, fives and tens.	Count in steps of 2, 3 and 5 from 0, and in tens from any number, forwards and backwards.	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. Count backwards through zero to include negative numbers.	Count forwards or backwards in steps of powers of 10 for any number up to 1 million. Count forwards and backwards with positive and negative whole numbers, including through zero.	Consolidate previous learning
Taught in:	Au1, Au4, Sp2, Su4	Au1	Au1, A3	Au1, Au4	Au1	
Place Value Represent	Identify and represent numbers using objects and pictorial representations. Read and write numbers to 100 in numerals. Read and write numbers from 1 to 10 in numerals and words.	Read and write numbers to at least 100 in numerals and words. Identify, represent and estimate numbers using different representations, including the number line.	Identify, represent and estimate number using different representations. Read and write numbers up to 1000 in numerals and words.	Identify, represent and estimate number using different representations. Read Roman numerals to 100 and know that over time, the numeral system changed to include the concept of zero and place value.	Read, write (order and compare) numbers to at least 1 million, and determine the value of each digit. Read Roman numerals to 1000 and recognise years written in Roman numerals.	Read, write (order and compare) numbers to at least 10 million, and determine the value of each digit.
Taught in:	Au1, Au4, Sp2, Su 4	Au1	Au1	Au1	Au1	Au1
Place Value Use and Compare	Given a number, identify one more and one less.	Recognise the place value of each digit in a two-digit number. Compare and order numbers from 0 up to 100. Use <,> and = signs.	Recognise the place value of each digit in a three-digit number. Compare and order numbers to 1000.	Find 1000 more or less than a given number. Recognise the place value of each digit a 4-digit number. Order and compare numbers beyond 1000.	Order and compare numbers to at least 1 million and determine the value of each digit.	Order and compare numbers up to 10 million and determine the value of each digit.
Taught in:	Au1, Au4, Sp2, Su4	Au1	Au1	Au1	Au1	Au1
Place Value Problems and Rounding	NA	Use place value and number facts to solve problems.	Solve number problems and practical problems involving all of the above.	Round any number to the nearest 10, 100 or 1000. Solve number and practical problems that involve all of the above and with increasingly large positive numbers.	Interpret negative numbers in context. Round any number up to 1 million to the nearest 100 thousand, 10 thousand etc.	Round any whole number to a required degree of accuracy. Use negative numbers in context, and calculate intervals across intervals across zero. Solve number and practical problems.
Taught in:		Au1	Au1	Au1	Au1	Au1

Progression in Addition and Subtraction

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Addition and Subtraction Recall, Represent, Use	Read, write and interpret mathematical statements involving add, subtract and equals signs. 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. Show that addition of 2 numbers can be done in any order (commutative) and subtraction cannot. Recognise and use the inverse relationship between + and – and use this to check calculations and solve problems.	Estimate the answer to a calculation and use the 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.	Review previous learning
Taught in:	Au2, Sp1	Au2	Au2	Au2	Au2	
Addition and Subtraction Calculations	Add and subtract 1 and 2 digit numbers to 20, including zero.	Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a 2 digit number and ones, a 2 digit numbers and tens, two 2-digit numbers, adding 3 one digit numbers.	Add and subtract numbers mentally, including: a 3-digit number and ones, a 3-digit number and tens, a 3-digit number and hundreds. Add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction.	Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.	Add and subtract whole numbers with more than 4 digits, including using formal written methods. Add and subtract numbers mentally with increasingly large numbers.	Perform mental calculations, including with mixed operations and large numbers. Use their knowledge of the order of operations to carry out calculations involving the 4 operations.
Taught in:	Au2, Sp1	Au2	Au2	Au2	Au2	Au2
Addition and Subtraction Problem Solving	Solve 1-step problems that involve addition and subtraction, using concrete and pictorial. Complete missing number problems such as 7=? +9.	Solve problems with addition and subtraction: Using concrete and pictorial, including those involving numbers, quantities and measures. 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 2-step problems in contexts, deciding which operations and methods to use and why.	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 and a combination of these, including understanding the meaning of the equals sign.	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
Taught in:	Au2, Sp1	Au2	Au2	Au2	Au2	Au2

Progression in Multiplication and Division

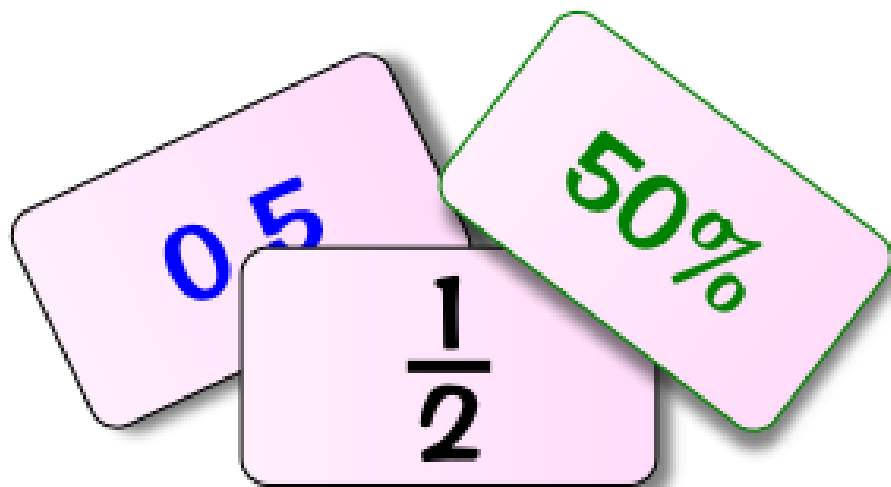|	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Multiplication and division: Recall, Represent, Use	NA	Recall and use multiplication and division facts for the 2, 5 and 10 x tables, including recognising odd and even numbers. Show that multiplication of 2 numbers can be done in any order (commutative) and division cannot.	Recall and use multiplication and division facts for the 3, 4 and 8 x tables.	Recall multiplication and division facts for times tables to 12 x 12. Use place value, known and derived facts to multiply, and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying 3 numbers. Recognise 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 2 numbers. Know and use the vocabulary of prime numbers, prime factors and composite numbers. Establish whether a number to 100 is prime and recall primes to 19. Recognise square and cube numbers. Use notation for square and cube numbers.	Identify common factors, common multiples and prime numbers. Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.
Taught in:		Au4, Sp1	Au3	Au4, Sp1	Au4	Au2
Multiplication and division: Calculations	NA	Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the x, ÷ and = signs.	Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for 2-digit numbers x 1-digit, using mental methods and progressing to formal written methods.	Multiply 2-digit by a 1-digit number using formal written layout.	X numbers up to 4 digits by a 1-digit using a formal written method, including long multiplication for 2-digit numbers. X and ÷ numbers mentally drawing upon known facts. ÷ numbers up to 4 digits by a 1-digit using formal short division and interpret remainders for the context. X and ÷ whole numbers and decimals by 10, 100 and 1000.	X numbers up to 4 digits by 1-digit using a formal written method, including long X. ÷ up to 4 digits by a 2-digit whole number using formal long ÷, and interpret remainders as fractions or by rounding. ÷ numbers up to 4 digits by a 2-digit number using formal short ÷interpreting remainders. Perform mental calculations, including with mixed operations and large numbers.
Taught in:		Au4, Sp1	Au3, Sp1	Sp1	Au4, Sp1, Su1	Au2

Multiplication and division: Solve Problems	Solve 1 step problems involving multiplication and division, by calculating the answer using concrete and pictorial representations and arrays with the support of an adult.	Solve 1 step problems involving multiplication and division using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in contexts.	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, including the distributive law to multiply 2-digit by 1-digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.	Solve problems involving X and ÷ including using their knowledge of factors and multiples, squares ad cubes. Solve problems involving X and ÷, including scaling by simple fractions and problems involving simple rates.	Solve problems involving +, - , X and ÷.
Taught in:	Su1	Au4, Sp1	Sp1	Sp1	Au4, Sp1	Au2
Multiplication and division: Combined Operations	NA	NA	NA	NA	Solve problems involving +, - , X and ÷ and a combination of these, including understanding the meaning of the = sign.	Use their knowledge of the order of operations to carry out calculations involving the four operations.
Taught in:					Sp1	Au2

Progression in Fractions, Decimals and Percentages

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Fractions: Recognise and Write	Recognise, find and name a half as one of 2 equal parts of an object, shape or quantity. Recognise, find and name a quarter as one of 4 equal parts of an object, shape or quantity.	Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a shape, length, set of objects or quantity.	Count up and down in tenths; Recognise that tenths arise from dividing an object into 10 equal parts and in dividing 1-digit numbers or quantities by 10. Recognise, find and write fractions of a discrete set of objects: Unit fractions and non-unit fractions with small denominators. Recognise and use fractions as numbers: Unit fractions and non-unit fractions with small denominators.	Count up and down in hundredths; Recognise that hundredths arise from dividing an object by 100 and dividing 10ths by 10.	Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths. Recognise mixed numbers and improper fractions and convert from one form to another and write mathematical statements >1 as a mixed number.	Review previous learning.
Taught in:	Su2	Sp4	Sp5	Sp3	Sp2	
Fractions: Compare	NA	Recognise the equivalence of 2/4 and ½.	Recognise and show diagrams, equivalent fractions with small denominators. Compare and order unit fractions, and fractions with the same denominator.	Recognise and show, using diagrams, families of common equivalent fractions.	Compare and order fractions whose denominators are all multiples of the same number.	Use common factors to simplify fractions; use common multiples to express fractions in the same denomination. Compare and order fractions, including fractions >1.
Taught in:		Sp4	Su1	Sp3	Sp2	Au3
Fractions: Calculations	NA	Write simple fractions e.g. ½ of 6 = 3.	Add and subtract fractions with the same denominator within one whole e.g. 5/7 + 1/7 = 6/7.	Add and subtract fractions with the same denominator.	Add and subtract fractions with the same denominator and denominators that are multiples of the same number. 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. Multiply simple pairs of proper fractions, writing the answer in the simplest form. Divide proper fractions by whole numbers.
Taught in:		Sp4	Su1	Sp3	Sp3	Au3

Fractions: Solve Problems	**NA**	NA	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.	Review previous learning	Review previous learning
Taught in:			Sp5, Su1	Sp3		
Decimals, Recognise and Write	NA	NA	NA	Recognise and write decimal equivalents of any number of tenths or hundredths. Recognise and write decimal equivalents to ¼, ½, 1/3.	Read and write decimal numbers as fractions e.g. 0.71 = 71/100. Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.	Identify the value of each digit in numbers given to 3 decimal places.
Taught in:				Sp4, Su1	Sp3	Sp1
Decimals: Compare	**NA**	NA	NA	Round decimals with 1 decimal place to the nearest whole number. Compare numbers with the same number of decimal places up to 2 decimal places.	Round decimals with 2 decimal place to the nearest whole number and 1 decimal place. Read, write, order and compare numbers with up to 3 decimal places.	Review previous learning
Taught in:				Su1	Sp3	
Decimals: Calculations and Problems	**NA**	NA	NA	Find the effect of dividing a 1 or 2-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tens and hundredths.	Solve problems involving number up to 3 decimal places.	Multiply and divide numbers by 10, 100 and 1000, giving answers up to 3 decimal places. Multiply 1-digit numbers with up to 2 decimal places by whole numbers. Use written division methods in cases where the answer has up to 2 decimal places. Solve problems, which require answers to be rounded to specified degrees of accuracy.
Taught in:				Sp4	Su1	Sp1

				Solve simple measure and money problems involving fractions and decimals to 2 decimal places.	Recognise the % symbol and understand that percent means 'parts per hundred', and write percentages as a fraction with a denominator of 100 and as a decimal. Solve problems, which require knowing % and decimal equivalents of ½, ¼, 1/5, 2/5 and 4/5 and with those fractions with a denominator of 10 or 25.	Associate a fraction with division and calculate decimal fraction equivalents. Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.
Fractions, Decimals and Percentages						
Taught in:				Sp3, Sp4, Su1	Sp3	Sp1, Sp2
Ratio and Proportion	NA	NA	NA	NA	NA	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 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.
Taught in:						Sp6

Progression in Algebra

$$y=mx+b$$

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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 inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	Solve problems including missing number problems.	NA	NA	Use simple formulae. Generate and describe linear number sequences. Express missing number problems algebraically. Find pairs of numbers that satisfy an equation with two unknowns. Enumerate possibilities of combinations of two variables.
Taught in:	Covered within Addition and Subtraction. Au2	Covered within Addition and Subtraction. Au2	Covered within Addition and Subtraction. Au2			Sp3

Progression in Measure

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Measurement: Using Measure	Compare, describe and solve practical problems for lengths and heights, mass and weight, capacity and volume. Measure and begin to record lengths and heights, mass and weight, capacity and volume, time.	Choose and use appropriate standard units to estimate and measure length and height, mass, temperature and capacity to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels. Compare and order lengths, mass, volume, capacity and record the results using <,> and =.	Measure, compare add and subtract lengths, mass, volume and capacity.	Convert between different units of measure e.g. km to m, hour to min. Estimate, compare and calculate different measures.	Convert between different units of measure e.g. km, m, cm and mm; g and kg; l and ml. Understand and use approximate equivalences between metric units and common imperial units such as pounds, inches and pints. Use all 4 operations to solve problems involving measure.	Solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate. Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit to larger and vice versa, using decimal notation up to 3 decimal places. Convert between miles and km.
Taught in:	Sp3, Sp4, Su6	Sp5, Su4	Sp4, Su4	Au3, Sp2, Su5	Su1, Su4, Su5	Sp4
Measurement: Money	Recognise and know the value of different denominations of coins and notes.	Recognise and use symbols for £ and P; combine amounts to make a particular value. Find different combinations of coins that equal the same amounts of money. Solve simple problems in a practical context involving addition, subtraction of money of the same unit, including giving change.	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.	Review previous learning.
Taught in:	Su5	Au3	Sp2	Su2	Su1	

Measurement: Time	Sequence events in chronological order using language. Recognise and use language related to dates, including days of the week, weeks, months and years. Tell the time to the hour and half past the hour and draw the hands on a clock face.	Compare and sequence intervals of time. Tell and write the time to 5 mins, including quarter past/to the hour and draw the hands on a clock face. Know the number of mins in an hour and the number of hours in a day.	Tell and write the time from analogue clock, including using Roman numerals from I to XII, and 12-hour and 24 hour clocks. Estimate and read time with increasing accuracy to the nearest min; record and compare time in terms of secs, mins and hours; use vocabulary such as o'clock, am/pm, morning, afternoon, midnight, noon. Know the number of secs in a min and days in each month, year and leap year. Compare durations of events.	Read, write and convert time between analogue and digital 12 and 24 hour clocks. Solve problems involving converting from hours to mins, mins to secs, years to months, weeks to days.	Solve problems involving converting between units of time.	Use, read, write and convert between standard units, converting measurements of time from a smaller unit to a larger and vice versa.
Taught in:	Su6	Su3	Su2	Su3	Su4	Su4
Measurement: Perimeter, area and volume	NA	NA	Measure the perimeter of simple 2-D shapes.	Measure and calculate the perimeter of a rectilinear figure in cm and m. Find the area of a rectilinear shape by counting squares.	Measure and calculate the perimeter of composite rectilinear shapes in cm and m. Calculate and compare the area of rectangles, and including using standard units, square cm and square m and estimate the area of irregular shapes. Estimate volume.	Recognise that shapes with the same area can have different perimeters and vice versa. Recognise when it is possible to use a formula 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 cubic cm and cubic m and extending to other units e.g. mm³ and km³.
Taught in:			Sp4	Au3, Sp2	Au5, Su5	Sp5

Progression in Geometry

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Geometry: 2D Shapes	Recognise and name common 2D shapes.	Identify and describe the properties of 2D shapes, including the number of sides and symmetry in a vertical line. Identify 2D shapes on the surface of 3D shapes. Compare and sort common 2D shapes and everyday objects.	Draw 2D shapes	Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. 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. Use the properties of rectangles to deduce related facts and find missing lengths and angles.	Draw 2D shapes using given dimensions and angles. Compare and classify geometric shapes based on their properties and sizes. Illustrate and name parts of a circle, including radius, diameter and circumference. Know that the diameter is twice the size of the radius.
Taught in:	Au3	Sp3	Su3	Su5	Su2	Su1
Geometry: 3D Shapes	Recognise and name common 3D shapes.	Recognise and name common 3D shapes. Compare and sort common 3D shapes and everyday objects.	Make 3D shapes using modelling materials. Recognise 3D shapes in different orientations and describe them.	NA	Identify 3D shapes from 2D representations.	Recognise, describe and build 3D shapes, including making nets.
Taught in:	Au3	Sp3	Su3		Su2	Su1
Geometry: Angles and lines	NA	NA	Recognise angles are a property of a shape or a description of a turn. Identify right angles, recognise that 2 right angles make a half turn, 3 right angles make a ¾ turn and 4 right angles make a full turn. Identify whether angles are greater than or less than a right angle. Identify horizontal and vertical lines and pairs of perpendicular lines.	Identify acute and obtuse angles and compare and order up to 2 right angles by size. Identify lines of symmetry in 2D shapes presented in different orientations. 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. Draw given angles, and measure them in degrees. Identify angles at a point and one whole turn, angles at a point on a straight line and ½ turn, other multiples of 90.	Find unknown angles in any triangles, quadrilateral, and regular polygons. Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.
Taught in:			Su3	Su5	Su2	Su1

Geometry: Position and Direction	Describe position, direction and movement, including whole, half, quarter and three quarter turns.	Order and arrange combinations of mathematical objects in patterns and sequences. Use mathematical vocabulary to describe position, direction and 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).	NA	Describe positions on a grid as coordinates in the first quadrant. Describe movements between positions as translations of a given unit to the left/right and up/down. Plot specified points and draw sides to complete a given polygon.	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.	Describe positions on the full coordinate grid (all 4 quadrants). Draw and translate simple shapes on the coordinate plane, and reflect them in the axis.
Taught in:	Su3	Sp3, Su1		Su6	Su3	Au4

Progression in Statistics

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Statistics: Present and interpret	NA	Interpret and construct simple pictograms, tally charts, block diagrams and simple tables.	Interpret and present data using 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 to solve problems.
Taught in:	Sp2	Sp3	Su4	Au3	Au3	Su3
Statistics: Solve problems	NA	Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity. Ask and answer questions about totalling and comparing categorical data.	Solve one and two-step questions using information presented in scaled bar charts and pictograms and tables.	Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other groups.	Solve comparison, sum and difference problems using information presented in a line graph.	Calculate and interpret the mean as an average.
Taught in:		Sp2	Sp3	Su4	Au3	Su3