Five Stones Learning Federation
Mixed Year Five and Six Maths Long Term Plan
2021 to 2022

Fluency Development (Key Instant Recall Facts and Skills)		
Key Skills		
Autumn	**Spring**	**Summer**
Place value, number bonds, double and halving, multiplication and division facts, factors, conversions, rounding, squared numbers, fractions and decimals, x10, 100, 1000, fraction/percentage of an amount, number lines, BODMAS, prime numbers, angles, area and perimeter		
Key Instant Recall Facts		
Autumn 1	**Spring 1**	**Summer 1**
Year 5 – I know decimal number bonds to 1 and 10. Year 6 - I can use x table facts to multiply and divide decimals	Year 5 – I can recall metric conversions. Year 6 - I can convert between decimals, fractions and percentages.	Year 5 – I know doubles and halves of • All numbers to 100 • All multiples of 10 to 10,000 • All multiples of 100 to 10,000. Year 6 - I know doubles and halves of 2 digit decimals.
Autumn 2	**Spring 2**	**Summer 2**
Year 5 – I know the multiplication and division facts for all times tables up to 12 × 12 I can recall square numbers up to 122 and their square roots. Year 6 - I can identify common factors of a pair of numbers.	Year 5 – I can identify prime numbers up to 20. Year 6 - I can identify prime numbers up to 50.	Year 5 – I can find factor pairs of a number. I know the tests of divisibility for 2, 3, 5, 9 and 10. Year 6 - I know the tests of divisibility for 4 and 6.
** Ensure revision of previious KIRFs. See KIRF progression map at the end of this document**		

Topic Progression		
Autumn 1	**Spring 1**	**Summer 1**
Number Place value and Counting (2 weeks) **(Application of measure (incl. time and money) throughout)** Four Operations (5 weeks) **(Application of measure (incl. time and money) and statistics throughout)** **(7 weeks)**	**Measure** Converting Units; including time (2 weeks) Perimeter, Area and Volume (2 weeks) **(Application of number (incl. PV, A&S, M&D) throughout)** **Number/ Algebra** (2 weeks) Y5 – Decimals Y6 - Algebra **(6 Weeks)**	**Consolidation and retrieval** (2 weeks) Year 5 –Four Operations Consolidation Year 6 – SATs Revision (as informed by teacher assessment) **Consolidation and retrieval** (2 weeks) Year 5 –Fractions, Decimals and Percentages Consolidation Year 6 – SATs Revision (as informed by teacher assessment) **Consolidation and retrieval** (1 week) **(5 Weeks)**
Autumn 2	**Spring 2**	**Summer 2**
Number Fractions (4 weeks) **(Application of number (incl. PV, A&S, M&D) throughout)** Decimals, Percentages and Fractions (3 weeks) **(Application of number (incl. PV, A&S, M&D) throughout)** **(7 Weeks)**	**Geometry** Position and Direction (Incl. coordinates) (2 weeks) Properties of Shape and Angles (3 weeks) **Statistics** Graphs, Charts and Tables (1 weeks) **(6 Weeks)**	**Consolidation, Retrieval and Application** Efficiency and fluency in mathematical thinking with application to real life mathematically rich projects (7 weeks) **(7 Weeks)**

Five Stones Learning Federation
Year Five and Six Maths Planning Guidance
2020 to 2021

	Year 5			Year 6		
Strand	**Previous Experience (Check and Consolidate)**	**Ready-to-Progress Criteria**	**Suggested Small Steps**	**Previous Experience (Check and Consolidate)**	**Ready-to-Progress Criteria**	**Suggested Small Steps**
Number and Place Value	Know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100; apply this to identify and work out how many 100s there are in other four-digit multiples of 100.	5NPV–1 Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1. Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01. Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01.	1000s, 100s, 10s and 1s Numbers to 10,000 Rounding to the nearest 10 Rounding to the nearest 100 Rounding to 10, 100 and 1,000 Numbers to 100,000 Compare and order numbers to 100,000 Round numbers within 100,000 Numbers to a million Counting in 10s, 100s, 1,000s, 10,000s and 100,000s Compare and order numbers to one million Round numbers to one million Negative numbers Roman numerals	Understand the relationship between powers of 10 from 1 hundredth to 1,000 in terms of grouping and exchange (for example, 1 is equal to 10 tenths) and in terms of scaling (for example, 1 is ten times the size of 1 tenth).	6NPV–1 Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000).	Numbers to 10,000 Numbers to 100,000 Numbers to a million Numbers to 10 million Compare and order any number Round numbers to 10, 100 and 1,000 Round any number Negative numbers (in context) Negative numbers (more abstract)
	Recognise the place value of each digit in four-digit numbers, and compose and decompose four-digit numbers using standard and non-standard partitioning.	5NPV–2 Recognise the place value of each digit in numbers with up to 2 decimal places, and compose and decompose numbers with up to 2 decimal places using standard and nonstandard partitioning.		Recognise the place value of each digit in numbers with units from thousands to hundredths and compose and decompose these numbers using standard and nonstandard partitioning.	6NPV–2 Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and nonstandard partitioning.	
	Reason about the location of any four-digit number in the linear number system, including identifying the previous and next multiple of 1,000 and 100, and rounding to the nearest of each.	5NPV–3 Reason about the location of any number with up to 2 decimals places in the linear number system, including identifying the previous and next multiple of 1		Reason about the location of numbers between 0.01 and 9,999 in the linear number system. Round whole numbers to the nearest multiple	6NPV–3 Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as	

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		and 0.1 and rounding to the nearest of each.		of 1,000, 100 or 10, as appropriate. Round decimal fractions to the nearest whole number or nearest multiple of 0.01	appropriate, including in contexts.	
	Divide 1,000 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 1,000 with 2, 4, 5 and 10 equal parts.	5NPV–4 Divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 2, 4, 5 and 10 equal parts.		Divide 1000, 100 and 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines with 2, 4, 5 and 10 equal parts.	6NPV–4 Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.	
	Divide 100 and 1,000 into 2, 4, 5 and 10 equal parts. Find unit fractions of quantities using known division facts (multiplication tables fluency).	5NPV–5 Convert between units of measure, including using common decimals and fractions.				
Number Facts/: Addition and Subtraction/ Multiplication and Division	Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10 or 100), for example: 8 + 6 = 14 80 + 60 = 140 800 + 600 = 1400 3 x 4 = 12 30 x 4 = 120 300 x 4 = 1200	5NF–2 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth), for example: 8 + 6 = 14 0.8 + 0.6 = 1.4 0.08 + 0.06 = 0.14 3 x 4 = 12 0.3 x 4 = 1.2 0.03 x 4 = 0.12	Add two 4-digit numbers - one exchange Add two 4-digit numbers - more than one exchange Add whole numbers with more than 4 digits Subtract two 4-digit numbers - one exchange Subtract two 4-digit numbers - more than one exchange Subtract whole numbers with more than 4-digits Round to estimate and approximate Inverse operations (addition and subtraction) Multi-step addition and subtraction problems	Be fluent in all key stage 2 additive and multiplicative number facts (see Appendix: number facts fluency overview) and calculation. Manipulate additive equations, including applying understanding of the inverse relationship between addition and subtraction, and the commutative property of addition. Manipulate multiplicative equations, including	6AS/MD–1 Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).	Add whole numbers with more than 4 digits Subtract whole numbers with more than 4 digits Inverse operations (addition and subtraction) Multi-step addition and subtraction problems Add and subtract integers Multiply 4-digits by 1-digit Multiply 2-digits (area model) Multiply 2-digits by 2-digits Multiply 3-digits by 2-digits Multiply up to a 4-digit number by a 2-digit number Divide 4-digits by 1-digit Divide with remainders Short division Division using factors

	Year 5			Year 6		
Strand	Previous Experience (Check and Consolidate)	Ready-to-Progress Criteria	Suggested Small Steps	Previous Experience (Check and Consolidate)	Ready-to-Progress Criteria	Suggested Small Steps
			Adding decimals within 1 Subtracting decimals within 1 Complements to 1 Adding decimals - crossing the whole Adding decimals with the same number of decimal places Subtracting decimals with the same number of decimal places Adding and subtracting decimals with the same number of decimal places problem solving Adding decimals with a different number of decimal places Subtracting decimals with a different number of decimal places Adding and subtracting decimals with a different number of decimal places problem solving Adding and subtracting wholes and decimals Decimal sequences Multiplying decimals by 10, 100 and 1,000 Dividing decimals by 10, 100 and 1,000	applying understanding of the inverse relationship between multiplication and division, and the commutative property of multiplication.		Long division (1) Long division (2) Long division (3) Long division (4) Factors Common factors Common multiples Primes to 100 Squares and Cubes Order of operations Mental calculations and estimation Reason from known facts Decimals up to 2 d.p. Understand thousandths Three decimal places Multiply by 10, 1OO and 1,000 Divide by 10, 1OO and 1,000 Multiply decimals by integers Divide decimals by integers Division to solve problems Using ratio language Ratio and fractions Introducing the ratio symbol Calculating ratio activity Calculating ratio Using scale factors Calculating scale factors Ratio and proportion problems Ratio and proportion problems (2) The mean
	Recall multiplication and division facts up to 12x12. Solve division problems, with two-digit dividends and one digit divisors, that involve remainders, for example: 74÷9= 8 r 2	5NF-1 Secure fluency in multiplication table facts, and corresponding division facts, through continued practice.	Multiples Factors Common factors Prime numbers activity Prime numbers Square numbers Cube numbers Multiply by 10 Multiply by 100			

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Strand	**Previous Experience (Check and Consolidate)**	**Ready-to-Progress Criteria**	**Suggested Small Steps**	**Previous Experience (Check and Consolidate)**	**Ready-to-Progress Criteria**	**Suggested Small Steps**
	Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to scaling a number by 10 or 100.	5MD–1 Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size.	Multiply by 10, 100 and 1,000 Divide by 10 Divide by 100 Divide by 10, IOO and 1,000 Multiples of 10, 100 and 1,000 Multiply 2-digits by 1-digit Multiply 3-digits by 1-digit Multiply 4-digits by 1-digit Area model activity Multiply 2-digits (area model) Multiply 2-digits by 2-digits Multiply 3-digits by 2-digits Multiply 4-digits by 2-digits (basic practice) Multiply 4-digits by 2-digits Divide 2-digits by 1-digit (1) Divide 2-digits by 1-digit (2) Divide 3-digits by 1-digit Divide 4-digits by 1-digit Divide with remainders	Make a given number (up to 9,999, including decimal fractions) 10, 100, 1 tenth or 1 hundredth times the size (multiply and divide by 10 and 100). Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10, 100, 1 tenth or 1 hundredth). Manipulate additive equations. Manipulate multiplicative equations.	6AS/MD–1 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.	
	Recall multiplication and division facts up to 12x12, and recognise products in multiplication tables as multiples of the corresponding number. Recognise multiples of 10, 100 and 1,000. Apply place-value knowledge to known additive and multiplicative number facts. Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients).	5MD–2 Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.				

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	Recall multiplication facts up to 12x12 . Manipulate multiplication and division equations.	5MD–3 Multiply any whole number with up to 4 digits by any one-digit number using a formal written method.		Recall multiplication and division facts up to 12 x 12. Apply place-value knowledge to known additive and multiplicative number facts.	6AS/MD–3 Solve problems involving ratio relationships.	
	Recall multiplication and division facts up to 12 x 12 Manipulate multiplication and division equations. Solve division problems, with two-digit dividends and one digit divisors, that involve remainders, for example: 74÷9= 8 r 2 and interpret remainders appropriately according to the context.	5MD–4 Divide a number with up to 4 digits by a one-digit number using a formal written method, and interpret remainders appropriately for the context.		Be fluent in all key stage 2 additive and multiplicative number facts and calculation. Manipulate additive equations. Manipulate multiplicative equations. Find a fraction of a quantity.	6AS/MD–4 Solve problems with 2 unknowns.	

Strand	Year 5			Year 6		
	Previous Experience (Check and Consolidate)	Ready-to-Progress Criteria	Suggested Small Steps	Previous Experience (Check and Consolidate)	Ready-to-Progress Criteria	Suggested Small Steps
Fractions	Recall multiplication and division facts up to 12 x 12 Find unit fractions of quantities using known division facts (multiplication tables fluency). Unitise using unit fractions (for example, understand that there are 3 one-fifths in three fifths).	5F–1 Find non-unit fractions of quantities.	What is a fraction? Equivalent fractions Equivalent fractions Fractions greater than 1 Improper fractions to mixed numbers Mixed numbers to improper fractions Number sequences Compare fractions less than 1 Order fractions less than 1 Compare fractions greater than 1 Order fractions greater than 1 Add and subtract fractions Add fractions within 1 activity Add fractions within 1 Add 3 or more fractions Add fractions Add mixed numbers activity Add mixed numbers Subtract fractions Subtract mixed numbers Subtraction - breaking the whole Subtract 2 mixed numbers Multiply unit fractions by an integer Multiply non-unit fractions by an integer Multiply mixed numbers by integers Calculate fractions of a quantity Fraction of an amount Using fractions as operators Fraction problem solving Decimals up to 2 d.p. Decimals as fractions (1) Decimals as fractions (2) Understand thousandths Thousandths as decimals Rounding decimals Order and compare decimals	Recall multiplication and division facts up to 12 x 12. Find factors and multiples of positive whole numbers, including common factors and common multiples. Find equivalent fractions and understand that they have the same value and the same position in the linear number system.	6F–1 Recognise when fractions can be simplified, and use common factors to simplify fractions.	Equivalent fractions Simplify fractions Improper fractions to mixed numbers Mixed numbers to improper fractions Fractions on a number line Compare and order (denominator) Compare and order (numerator) Add and subtract fractions (1) Add and subtract fractions activity Add and subtract fractions (2) Add mixed numbers Add fractions Subtract mixed numbers Subtract fractions Mixed addition and subtraction Multiply fractions by integers Multiply fractions by fractions Divide fractions by integers (1) Divide fractions by integers (2) Four rules with fractions Fraction of an amount Fraction of an amount - find the whole Decimals as fractions Fractions to decimals (1) Fractions to decimals (2) Understand percentages Fractions to percentages Equivalent FDP Order FDP Percentage of an amount (1) Percentage of an amount (2) Percentages (missing values)
	Recall multiplication and division facts up to 12 x 12 Reason about the location of fractions in the linear number system.	5F–2 Find equivalent fractions and understand that they have the same value and the same position in the linear number system.		Recall multiplication and division facts up to 12 x 12. Find factors and multiples of positive whole numbers. Find equivalent fractions. Reason about the location of fractions and mixed numbers in the linear number system.	6F–2 Express fractions in a common denomination and use this to compare fractions that are similar in value.	
	Divide powers of 10 into 2, 4, 5 and 10 equal parts.	5F–3 Recall decimal fraction equivalents for 1/2, ¼, 1/5 and 1/10 and for multiples of these proper fractions.		Reason about the location of fractions and mixed numbers in the linear number system. Find equivalent fractions.	6F–3 Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy.	

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Strand	**Previous Experience (Check and Consolidate)**	**Ready-to-Progress Criteria**	**Suggested Small Steps**	**Previous Experience (Check and Consolidate)**	**Ready-to-Progress Criteria**	**Suggested Small Steps**
			Understand percentages Percentages as fractions and decimals Equivalent FDP			
Geometry: Shape & Position and Direction	Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations. Identify whether the interior angles of a polygon are equal or not.	5G–1 Compare angles, estimate and measure angles in degrees (°) and draw angles of a given size.	Measure perimeter Perimeter on a grid Perimeter of rectangles Perimeter of rectilinear shapes Calculate perimeter Counting squares Area of rectangles Area of compound shapes Area of irregular shapes **Identify angles** Compare and order angles Measuring angles in degrees Measuring with a protractor (1) Measuring with a protractor (2) Drawing lines and angles accurately activity Drawing lines and angles accurately Calculating angles on a straight line Calculating angles around a point Triangles Quadrilaterals Calculating lengths and angles in shapes Regular and irregular polygons Reasoning about 3-D shapes Describe position Draw on a grid Position in the first quadrant Translation Translation with coordinates	Find the perimeter of regular and irregular polygons. Compare angles, estimate and measure angles in degrees (°) and draw angles of a given size. Compare areas and calculate the area of rectangles (including squares) using standard units.	6G–1 Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.	The first quadrant Four quadrants Translations Reflections Shapes — area Area and perimeter Area of a triangle (1) Area of a triangle (2) Area of a triangle (3) Area of a parallelogram What is volume? Volume - counting Cubes Volume of a cuboid Measure with a protractor Draw lines and angles accurately Introduce angles Angles on a straight line Angles around a point Calculate angles Vertically opposite angles Angles in a triangle Angles in a triangle - special cases Angles in a triangle - missing angles Angles in special quadrilaterals Angles in regular polygons Draw shapes accurately Draw nets of 3-D shapes
	Compose polygons from smaller shapes. Recall multiplication facts up to 12 x 12 .	5G–2 Compare areas and calculate the area of rectangles (including squares) using standard units.				

	Year 5			Year 6		
Strand	**Previous Experience (Check and Consolidate)**	**Ready-to-Progress Criteria**	**Suggested Small Steps**	**Previous Experience (Check and Consolidate)**	**Ready-to-Progress Criteria**	**Suggested Small Steps**
			Lines of symmetry Complete a symmetric figure Reflection Reflection with coordinates			
Measurement: Length/ Height			Kilometres Kilograms and kilometres Millimetres and millilitres Metric units activity Metric units Imperial units activity Imperial units What is volume? Compare volume Estimate volume Estimate capacity			Metric measures Convert metric measures Calculate with metric measures Miles and kilometres Imperial measures
Measurement : Weight/Volum						
Measurement: money						

	Year 5			Year 6		
Strand	**Previous Experience (Check and Consolidate)**	**Ready-to-Progress Criteria**	**Suggested Small Steps**	**Previous Experience (Check and Consolidate)**	**Ready-to-Progress Criteria**	**Suggested Small Steps**
Measurement: Time			Converting units of time Timetables			
Statistics: Graphs and Charts			Interpret charts Comparison, sum and difference Introduce line graphs Read and interpret line graphs Draw line graphs Use line graphs to solve problems Read and interpret tables Two-way tables Timetables			Line graphs Circles Read and interpret pie charts Draw pie charts
Algebra						Find a rule - one step Find a rule - two step Forming expressions Substitution Formulae Forming equations Solve simple one-step equations Solve two-step equations Find pairs of values (1) Find pairs of values (2)

Five Stones Learning Federation
Year Five and Six Vocabulary Progression
Key: Introducing, Embedding, Focusing

Subject area		Year Five			Year Six		
		Previous Vocabulary	Year 5 Vocabulary	Stem Sentences	Previous Vocabulary	Year 6 Vocabulary	Stem Sentences
Number	Place Value and Counting	Number, Whole. More, Less/ fewer. Subitise Cardinal value, Counting, Digit, Place Value, Tens, Ones, Part, Greater, Fewer, Zero (number names), Subitise, Cardinal value, Odd, Even, Infinite, Quantity, Appropriate number names, Hundred, Ordinal, Boundary, Thousand, Composed, Composition, Decomposed, Round(ed), Distribution, Integer (positive and negative), Interval, Roman Numerals, Positive numbers, Negative numbers, Place holder/ Decimal place holder	Million Approximate Approximations	**Numbers to 1,000,000** **Unitising** • *Ten* one thousands make ten thousand. (10000). • *One hundred* hundreds make one ten thousand. (10000). • *Ten ten thousands* make one hundred thousand. (100000). *One hundred* one thousands makes one hundred thousands.(100000). **Ordering, Comparing, Positioning, Rounding** • The midpoint of ___ and ___ is ___, so the midpoint of ___ thousands and ___ thousands is ___ thousands. • ___ is less than ___, so ___ thousand is less than ___ thousand. • ___ is greater than ___, so ___ thousand is greater than ___ thousand. • To compare *3* digit numbers, we need to compare the *hundreds* digits; if the *hundreds* digits are the same, we need to compare the *tens* digits; if the *tens* digits are the same, we need to compare the *ones* digit.	Number, Whole. More, Less/ fewer. Subitise Cardinal value, Counting, Digit, Place Value, Tens, Ones, Part, Greater, Fewer, Zero (number names), Subitise, Cardinal value, Odd, Even, Infinite, Quantity, Appropriate number names, Hundred, Ordinal, Boundary, Thousand, Composed, Composition, Decomposed, Round(ed), Distribution, Integer (positive and negative), Interval, Roman Numerals, Positive numbers, Negative numbers, Place holder/ Decimal place holder, Million, Approximate, Approximations	Ten Million Powers of ten Average Median Mode Mean	**Numbers up to 10,000,000** **Unitising** • One million is one thousand thousands. • The ___ represents ___. • The value of the ___ is ___. **Rounding** • ___ is between ___ and ___. • The previous multiple of one million is ___. • The next multiple of one million is ___. • ___ is nearest to ___. • ___ is __ when rounded to the nearest million. • When rounding to the nearest million, the *hundred thousands* digit is the digit to consider. If it is four or less we round *down*. If it is five or more, we round *up*. • ___ is between ___ and ___. • The previous multiple of one million is ___. • The next multiple of one million is ___. • ___ is nearest to ___. • ___ is __ when rounded to the nearest million. • When rounding to a particular degree of accuracy, the digit to the right of the place value you are rounding to is the one that determines whether to round up or down.

Subject area		Year Five			Year Six		
		Previous Vocabulary	Year 5 Vocabulary	Stem Sentences	Previous Vocabulary	Year 6 Vocabulary	Stem Sentences
				(Adapt same stem sentence for use with 4 and 5 digit numbers). • The previous multiple of one hundred thousand is ___. The next multiple of one hundred thousand is ___. • ___ is nearest to ___. • ___ is ___ when rounded to the nearest one hundred thousand. When rounding to the nearest 100,000, the *ten thousand* digit is the digit to consider. If it is 4 or less, we round *down*. If it is 5 or more we round *up*. **Negative Numbers** • For temperatures *above/below* zero, the further the temperature is from zero the *hotter*/colder it is. • Temperatures *warmer/colder* than zero degrees are *positive/negative*. • Zero degrees is neither positive or negative. • Floors *above/below* the ground floor are *positive/negative*. • The ground floor is labelled zero; it is neither positive nor negative. • Places *above/below* sea level have a *positive/negative* elevation.			**Mean Average and Equal Shares** • The mean is the size of each part when a quantity is shared equally. • The ___ represents the ___. • The mean is the total of the numbers divided by how many numbers there are. • The dividend is ___. • The divisor is ___ because ___. • The mean is ___÷___=___. • If the number of values in the set stays the same and the total increases, the mean also increases. • If the number of values in the set stays the same and the total decreases, the mean also decreases.

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				• Sea level is labelled zero. It is neither positive not negative. <u>Horizontal alignment</u> Negative numbers are below zero becomes: • Negative numbers are to the left of zero. Positive numbers are above zero becomes: • Positive numbers are to the right of zero. <u>Leads to the following generalisations:</u> • Negative numbers are less than/below zero. • Positive numbers are greater than/above zero. For both postive and negative numbers, the larger the value of the number, the further it is from zero. • For negative temperatures, the further the number is from zero, the colder it is. • For positive temperatures, the further the number is from zero, the warmer it is. • When an object is below sea level, the further the number is from zero, the deeper the object. • When an object is above sea level, the further the number is from zero, the higher the object.			
	Addition	Part, Whole, Addition, Add, Total, **Sum**, Equal, Composition,	Order of operation BODMAS/ BIDMAS	**Additive and Multiplicative Relationships**	Part, Whole, Addition, Add, Total, **Sum**, Equal, Composition, Number		<u>Same Difference</u> • If the minuend and the subtrahend both <u>*increase/decrease*</u> by a given

Subject area	Year Five			Year Six		
	Previous Vocabulary	Year 5 Vocabulary	Stem Sentences	Previous Vocabulary	Year 6 Vocabulary	Stem Sentences
	Number sentence, Part, Whole, Addition, Add, Equal, Total, **Sum**, Amount, Inverse, Calculation, *Associative Law, Aggregation, Augmentation, Commutative,* Addend, Bridge, Regroup, Column addition, Triangular number, Additively, Compensation, complement	Brackets Orders/ Indices	• ___ is the whole; ___ is a part, ___ is a part and ___ is a part. • If a known whole is split into three parts and we know the value of two of them, we can find the missing part: the whole minus the two known parts is equal to the missing part; the sum of the two equal parts plus the missing part is equal to the whole, • If we know the value of the whole, and all but one of the parts, we can find the missing part: the whole minus the known parts is equal to the missing part; the sum of the known parts plus the missing part is equal to the whole. **Equivalence** • If one addend is increased by an amount and the other addend is decreased by the same amount, the sum remains the same. • I've subtracted __ from one addend, so I need to add ___ to the other addend to keep the sum the same. • I've added __ to one addend, so I need to subtract ___ from the other addend to keep the sum the same. **Efficient Strategies** • I've added ___ to one addend and kept the other addend the same,	sentence, Part, Whole, Addition, Add, Equal, Total, **Sum**, Amount, Inverse, Calculation, *Associative Law, Aggregation, Augmentation, Commutative,* Addend, Bridge, Regroup, Column addition, Triangular number, Additively, Compensation, complement, Order of operation, BODMAS/ BIDMAS, Brackets, Orders/ Indices		amount, the difference <u>*remains the same*</u>. **Combining Division with Addition and Subtraction** • When there are no brackets, division is completed before addition and subtraction. • When two dividends are divided by the same divisor, we can add the dividends first and then divide. • When two dividends are divided by the same divisor, we can subtract the dividends first and then divide.
Subtraction	Part, Whole, Take away, Equal, Total, Amount, Number sentence, Part, Whole, Take away, Equal, Total, Subtraction, Subtract, Minus, Calculation, Partition, Difference, *Partitioning, Reduction,* Subtrahend, Minuend, Inverse, Bridge, Exchange, Column subtraction, Working Forwards, Compensation, Decomposition			Part, Whole, Take away, Equal, Total, Amount, Number sentence, Part, Whole, Take away, Equal, Total, Subtraction, Subtract, Minus, Calculation, Partition, Difference, *Partitioning, Reduction,* Subtrahend, Minuend, Inverse, Bridge, Exchange, Column subtraction, Working Forwards, Compensation, Decomposition		

Subject area		Year Five			Year Six		
		Previous Vocabulary	Year 5 Vocabulary	Stem Sentences	Previous Vocabulary	Year 6 Vocabulary	Stem Sentences
				so I must add ____ to the sum. • I've subtracted___ from one addend and kept the other addend the same, so I must subtract ____ from the sum. • If one addend remains the same and the other is changed by a certain amount, the sum changes by ***the same amount***. E.g. 46+24=70, so 48+24= __. • The sum has increased by ___; one addend has stayed the same, so the other addend must increase by ____. E.g. 36+47=83 so 36+ ___= 85. • The sum has decreased by ___; one addend has stayed the same, so the other addend must decrease by ____. E.g. 125+239=364, so 121 + ___=360. **Same Difference** • I've added ___ to the minuend (subrahend), so I need to add ___ to the subrahend (minuend) to keep the difference the same. • I've subtracted ___ from the minuend (subrahend), so I need to subtract ___ from the subrahend (minuend) to keep the difference the same. • I've added/subtracted ___ to/from both the minuend and the subrahend, so the			

Subject area	Year Five			Year Six		
	Previous Vocabulary	Year 5 Vocabulary	Stem Sentences	Previous Vocabulary	Year 6 Vocabulary	Stem Sentences
			difference *remains the same*. E.g. 4-1=3, 5-2=3, 6-3=3 etc. • If the minuend and subrahend are changed by the same amount, the difference *remains the same*. • I've kept the subrahend the same and added ___ to the minuend, so I must add ___ to the difference. • I've kept the subrahend the same and subtracted ___ from the minuend, so I must subtract ___ from the difference. • I've kept the minuend the same and added ___ to the subrahend, so I must subtract ___ from the difference. • I've kept the minuend the same and subtracted ___ from the subrahend, so I must add ___ to the difference.			
Multiplication	Equal, Unequal, Double, Part Whole, Equal, Unequal, Double, Group, Groups of, Unitising, Repeated addition, Array, Number sentence, Unitising, Repeated addition, expression Multiplication Expression, Multiplied Factor, Factor pairs, Product, Commutativity,	Factorise Increase factors Decrease factors Decimal fraction Integer Volume Cubic units Cubic centimetre Cubic metre Cube number Prime Brackets	**Use Equivalnece to Calculate** • If I double __, I must halve __ for the product to stay the same. • If I multiply __ by two, I must divide __ by two for the product to stay the same. E.g. If 2 x 2 = _ x 4; 32 x ___ = 16 x 10; 2000 x 10 = ___ x 5. • If I multiply __ *by three*, I must divide __ *by three* for the product to stay the same. • If I multiply one factor by __, I must	Equal, Unequal, Double, Part Whole, Equal, Unequal, Double, Group, Groups of, Unitising, Repeated addition, Array, Number sentence, Unitising, Repeated addition, expression Multiplication Expression, Multiplied Factor, Factor pairs, Product, Commutativity, Partitioning, Short,	Long multiplication Cubic units Cubic centimetre Cubic metre Cube number Factorise	**Multiplication Strategies for Larger Numbers and Long Multiplication** • To multiply multiples of ten, one hundred or one thousand, remove the zeros, find the product of the single-digit numbers and then replace the zeros. • If one factor is made ten times the size, the product will be ten times the size. • To multiply by a multiple of ten, use short multiplication by a single-digit number and then multiply by ten. • To multiply by a multiple of one hundred, use short multiplication

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	Partitioning, Short, multiplication, Regroup, Times, Compensation, Square numbers, Index notation	Common multiple Highest Common Factor Lowest Common Multiple Prime factor Prime factor decomposition	divide the other factor by __ for the product to stay the same • If I multiply the dividend by ten, I must multiply the divisor by ten for the quotient to stay the same. • If ___ is shared equally between one person, the person will get ____. If _____ is shared equally between _____ people, they will get _____ each. • If I divide the dividend by ten, I must divide the divisor by ten for the quotient to stay the same. • If I multiply the dividend by ___, I must multiply the divisor by ____ for the quotient to stay the same. • If I divide the dividend by ___, I must divide the divisor by ____ for the quotient to stay the same. **Multiplying and Dividing Decimal Fractions by Whole Numbers** • ___ x ___ ones = ___ ones so __ x ___ tenths = ___ tenths. • ___ones = ___ x ___ ones, so ___ tenths = ___x ___ tenths. • ___ ones = ___ x ___ ones, so ___ hundredths = ___ x ___ hundredths N.b. Draw attention to unitising, vary the order	multiplication, Regroup, Times, Compensation, Square numbers, Index notation, Factorise, Increase factors,Decrease factors, Decimal fraction, Integer, Volume, Cubic units, Cubic centimeter, Cubic metre, Cube number, Prime, Brackets, Common multiple, Highest Common, Factor, Lowest Common Multiple, Prime factor, Prime factor decomposition		by a single-digit number and then multiply by one hundred. • To multiply by a multiple of one thousand, use short multiplication by a single-digit number and then multiply by one thousand. • To multiply two two-digit numbers, first multiply by the ones, then multiply by the tens, and then add them together. • To multiply a three-digit number by a two-digit number, first multiply by the ones, then multiply by the tens and then add them together. **Long Multiplication** **E.g. Exchange in the Tens.** • First, line up the digits, writing the larger factor first and the smaller underneath: 31 x 24 • Next, multiply by the ones digit to give a partial product: multiply 31 by 4: • 4 ones x 1 one= 4 ones. 4 ones x 3 tens = 12 tens, so exchange twelve tens for 1 hundred and 2 tens. • Next, multiply by the tens digit to give a partial product: multiply 31 by 20. Place a zero to show that it's ten times the size. 2 tens x 1 one = 2 tens 2 tens x 3 tens to give 6 hundreds. • Finally, add the partial products: 124 plus 620 is equal to 744. **E.g. Exchange in the Hundreds.** • First, line up the digits, writing the larger factor first and the smaller underneath: 27 x 23 • Next, multiply by the ones digit to give a partial product: multiply 27 by 3:

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				in which factors are presented. • One-tenth of ____ metre(s) is _____ metre(s). • We had ____ tens. We now have _____ ones (reinforce unitising using before and after values). • When a number is divided by *ten*, the digits move one place to the *right*; when a number is multiplied by *zero-point-one/one tenth*, the digits move *one place to the right.* • When a number is divided by *one hundred*, the digits move *two places to the right*; when a number is multiplied by *zero-point-zero one/one-hundredth*, the digits move *two places to the right.* • __ is one-tenth the size of__, so __ x __ is one-tenth the size of __ x __. • __ is one-hundredth the size of__, so __ times __ is one-hundredth the size of __ x ___. E.g. 2.5 is one-tenth the size of 25, so 4 x 2.5 is one-tenth the size of 4 x 25. • 0.25 is one-hundredth the size of 25, so 4 times 0.25 is one-hundredth the size of 4 x 0.25. Generalisations: • If one factor is made one-tenth times			• 3 ones x 7 ones = 21 ones, so exchange (or regroup). • 21 ones = 2 tens and "1" one. • 3 ones x 2 tens = 6 tens, then add the 2 tens that were exchanged = 8 tens. • Then, multiply by the tens digit to give a partial product: multiply 27 by 20: Place a zero to show that it's ten times the size. • 2 tens x 7 ones = 14 tens, so exchange 14 tens for 1 hundred and 4 tens. • 2 tens x 2 tens = 4 hundreds, then add the 1 hundred that was exchanged = 5 hundreds. • Finally, add the partial products: • 81 plus 540 = 621. • When multiplying, you can write a composite number as factor x factor and use the associative law to make the calculation more efficient. • E.g. 23 x 14 can be solved as 23 x 2 x 7 (or 46 x 7). **Using Compensation to Calculate** • If I double one factor, I must double the product. • If I multiply one factor by ___, I must multiply the product by ___. • If I halve one factor, I must halve the product. • If I divide one factor by ___, I must divide the product by ___. • If a factor increases multiplicatively, the change to the product is the same. • If a factor decreases multiplicatively, the change to the product is the same. **Scale Factors, Ratio and Proportional Reasoning**

Subject area		Year Five			Year Six		
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				the size, the product will be one-tenth times the size. • If one factor is made one-hundredth times the size, the product will be one-hundredth times the size. • I move the digits of the number being multiplied __ places to the left until I get a whole number; then I multiply; then I move the digits of the product __ places to the right. • In short multiplication, if there is a decimal point in the number being multiplied, put a decimal point in the product; line it up with the decimal point in the number being multiplied. • If one factor is made __ times the size, the product will be __ times the size. Generalisations: • When a number is multiplied by a value greater than one, the product is greater than the original number. • When a number if multiplied by a value less than one, the product is less than the original number. • When one is a factor, the product is equal to the other factor.			• For every ___ ___, there are ___ ___. • There are ___ times as many ___ as there are ___. • To get from ___ ___ to ___ ___, I must multiply by ___, so I must multiply the amount of each ___ by ___. • There are (insert fraction) as many ___ as there are ___. • To get from ___ ___ to ___ ___, I must divide by ___, so I must divide the amount of each ___ by ___. **Decimal Place-Value Knowledge, Multiplication and Division** • To multiply a number by 10/100/1,000, move the digits one/two/three places left; to divide a number by 10/100/1,000, move the digits one/two/three places to the right. • One is the whole. • When a whole is divided into ten equal parts, each part is one tenth of the whole. There are ten tenths in one whole. 1 ÷ 10 = 0.1 • When a whole is divided into one hundred equal parts, each part is one hundredth of the whole. There are one hundred hundredths in one whole. 1 ÷ 100 = 0.01 • When one tenth of the whole is divided into ten equal parts, each part is one hundredth of the whole. • There are ten hundredths in one tenth. 0.1 ÷ 10 = 0.01 • When a whole is divided into one thousand parts, each part is one thousandth of the whole. • There are one thousand thousandths in one whole. 1 ÷ 1,000 = 0.001 • When one hundredth of the whole is divided into ten equal parts,

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				• ____ is one-tenth the size of ____, so ___ divided by _____ is one-tenth the size of ____ divided by _____. • _____ is one-hundredth the size of _____, so ____ divided by ____ is on-hundredth the size of _____ divided by _____. Generalisations: • If the dividend is made one-tenth times the size, the quotient wil be one-tenth times the size. • If the dividend is made one-hundredth times the size, the quotient will be one-hundredth times the size. • I move the digits of the dividend__ places to the left until I get a whole number, then I divide, then I move the digits of the quotient ____ places to the right. • In short division, if there is a decimal point in the dividend, put a decimal point in the quotient, line it up with the decimal point in the dividend. **Factors, Multiples, Prime Numbers and Composite Numbers** • There are ____ tiles. There are ____ rows and ____ columns, so ____ and ____ are factors of ____. Generalisations:			each part is one thousandth of the whole. • There are ten thousandths in one hundredth. • 0.01 ÷ 10 = 0.001 • When one tenth of the whole is divided into <u>*one hundred*</u> equal parts, each part is <u>*one thousandth*</u> of the whole. • There are one hundred thousandths in one tenth. • 0.1 ÷ 100 = 0.001 0.1 x 0.01 = 0.001. Generalisations: • When a number is <u>*multiplied/divided*</u> by one thousand, the digits move <u>*three*</u> places to the <u>*left/right*</u>. • When a number is <u>*multiplied/divided*</u> by one hundred, the digits move <u>*two*</u> places to the <u>*left/right*</u>. • When a number is <u>*multiplied/divided*</u> by ten, the digits move <u>*one*</u> places to the <u>*left/right*</u>. • Dividing by ten is equivalent to multiplying by <u>*one tenth.*</u> • Dividing by one hundred is equivalent to multiplying by <u>*one hundredth.*</u> • Dividing by one thousand is equivalent to multiplying by <u>*one thousandth*</u>. • When a number is multiplied by 0.1/one tenth, the digits move <u>*one place to the right.*</u>

Subject area		Year Five			Year Six		
		Previous Vocabulary	Year 5 Vocabulary	Stem Sentences	Previous Vocabulary	Year 6 Vocabulary	Stem Sentences
				• A positive integer is a whole number <u>*greater than zero*</u>. • 1 is a factor of all positive integers. • Every positive integer is a factor of itself. • The smallest factor of a positive integer is always 1. • The largest factor of a positive integer is always itself. • ____ is a factor of ____ because ___ is in the ____ times table. • ____ ÷ ____ = ___, so I can make a rectangular array that is ___ x ____. • ____ and ____ are factors of the product _____. • Numbers that have *more than two factors* are <u>*composite numbers.*</u> Numbers that have *exactly two factors* are called <u>*prime numbers*</u>. **Factors and Multiples** • The common factors of __ and ___ are ___, ___ and ____. • ___ is a factor of ___ because ___x___ = _____ (eg. 2 is a factor of 6 because 2x3=6) • ___ is a multiple of ____ because ____ x ____ = _____ (eg. 6 is a multiple of 2 because 2x3=6)			• When a number is multiplied by 0.01/one hundredth, the digits move <u>*two place to the right.*</u> • When a number is multiplied by 0.001/one thousandth, the digits move <u>*three places to the right.*</u>

Subject area		Year Five			Year Six		
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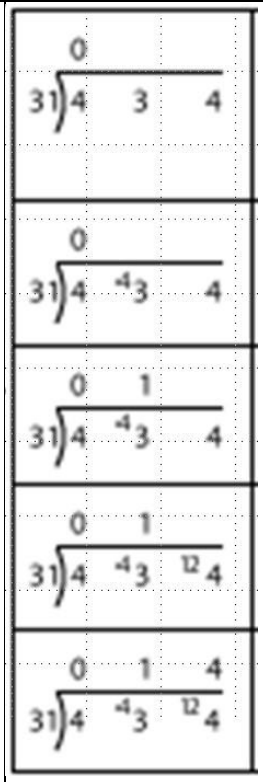
				• ___ is a factor of ___ because ___÷___ = _____ • ___ is a multiple of ___ because ___÷___ = _____ • ___ can come after ___ in the chain because ___ is a multiple of ____ (eg. 12 can come after 2 in the chain because 12 is a multiple of 2. • There are ___ intervals on the scale. We know that ___ and __ are factor pairs of 100, so there are _____ intervals of _____. Eg.There are 5 intervals on the scale. We know that 5 and 20 are factor pairs of 100, so there are 5 intervals of 20. **Combining Operations** Generalisations: • When there are no brackets, multiplication is completed before addition and subtraction.			
	Division	Half, Part, Whole, Equal, Unequal, Group, Groups of, Unitising, Repeated subtraction, Number sentence, Grouped equally , Remainder, Divided, Repeated subtraction, *Divisor, Dividend, Quotient,*	Common factor Square root	**Division – Grouping (Quotitive)** (We can skip count using the divisor to find the quotient) • __ is divided into groups of __. There are __ groups. • The __ represents the total number of __. • The __ represents the number of __ in each group.	Half, Part, Whole, Equal, Unequal, Group, Groups of, Unitising, Repeated subtraction, Number sentence, Grouped equally , Remainder, Divided, Repeated subtraction, *Divisor, Dividend, Quotient,* Divisibility, Partitioning, Short	Long division Scale factor	**Division: Dividing by Two-Digit Divisor** • If I divide the dividend by ten, I must divide the divisor by ten for the quotient to stay the same.

Subject area	Year Five			Year Six		
	Previous Vocabulary	Year 5 Vocabulary	Stem Sentences	Previous Vocabulary	Year 6 Vocabulary	Stem Sentences
	Divisibility, Partitioning, Short division, Compensation, Distributive law, Generalise		• ___ is divided into __ groups of __ with a remainder of __. **Division – Sharing (Partitive) (**We can skip count using the divisor to find the quotient.) • We can represent this as __ divided between __. • __ divided between __ is equal to __ each. • One __ is one each. That's __. (With practical equipment, then visuals). • Two __ is two each. That's __. • __ divided between __ is equal to __ each. E.g. We can represent this as *10* divided between *2*. • *10* divided between *2* is equal to *5* each. • One *5* is one each. That's *5*. (With practical equipment, then visuals). • Two *5s* is two each. That's *10*. • *10* divided between *2* is equal to *5* each. • **Division with Remainders** **Grouping** • ___ is divided into groups of ___. • ___ divided into groups of ___ is equal to ___ each, with a remainder of ___. • There are ___ groups and a remainder of ___. **Generalisations**	division, Compensation, Distributive law, Generalise, Common factor, Square root		 • 4 hundreds ÷ 31 = 0 hundreds remainder 4 hundreds. • 4 hundreds = 40 tens, so now we have 43 tens. • 43 tens ÷ 31 = 1 ten r 12 tens. • 12 tens = 120 ones, so now we have 124 ones. • 124 ones ÷ 31 = 4 ones. **Remainders as Fractions** • To represent a remainder as a fraction: • First, write the remainder as the numerator, then write the divisor as the denominator. **Remainders as Decimal Fractions** • To represent a remainder as a decimal fraction: • First, write a decimal point after the ones digit of both the dividend and the quotient. • Then write a place holder zero in the tenths column of the dividend. **Using Compensation to Calculate**

Subject area	Year Five			Year Six		
	Previous Vocabulary	Year 5 Vocabulary	Stem Sentences	Previous Vocabulary	Year 6 Vocabulary	Stem Sentences
			• The largest multiple of ___ that is less than or equal to ___ is ___. • ___ is a multiple of ___, so when it is divided into groups of ___ there are none left over; there is no remainder. • ___ is not a multiple of ___, so when it is divided into groups of ___ there are some left over; there is a remainder. • If the dividend <u>is</u> a multiple of the divisor, there is <u>no remainder</u>. • If the dividend <u>is</u> <u>not</u> a multiple of the divisor, there <u>is a remainder</u>. • The remainder is always less than the divisor.			• If the divisor is kept the same, when I double the dividend, I must double the quotient. • If the divisor is kept the same, when I halve the dividend, I must halve the quotient. • If the divisor is kept the same, when I multiply the dividend by ___, I must multiply the quotient by ___. • If the divisor is kept the same, when I divide the dividend by ___, I must divide the quotient by ___. • If the dividend is kept the same, when I double the divisor, I must halve the quotient. • If the dividend is kept the same, when I halve the divisor, I must double the quotient. • If the dividend is kept the same, when I multiply the divisor by ___, I must divide the quotient by ___. • If the dividend is kept the same, when I divide the divisor by ___, I must multiply the quotient by ___.
Fractions	Part, Whole, Equal, Fraction, Half, Third, Quarter, Notation, Numerator, Denominator, Equivalent, Unit Non-unit, Fifths, Sixths, Sevenths, Eights, Ninths, Tenths, Common fraction, Simple fraction, Vulgar fraction, Hundredths, Thousandths,	Equivalent Multiplicative relationship Simplified Cancel (a fraction) Common denominator Non-related fractions Operator	**Improper Fractions and Mixed Numbers** **Introducing Mixed Numbers** • Quantities made up of both wholes and parts can be expressed as mixed numbers. • In a mixed number, the numerator must always be <u>*smaller*</u> than the denominator. • $1\frac{3}{5}$ is <u>*one*</u> and <u>*three fifths*</u> or <u>*one*</u> and <u>*three one-fifths.*</u> (Ensure	Part, Whole, Equal, Fraction, Half, Third, Quarter, Notation, Numerator, Denominator, Equivalent, Unit Non-unit, Fifths, Sixths, Sevenths, Eights, Ninths, Tenths, Common fraction, Simple fraction, Vulgar fraction, Hundredths, Thousandths, Decimal, Fractions,	Percent Percentage Parts per hundred Recurring decimal	**Multiplying Whole Numbers and Fractions Repeated Addition** • To multiply a fraction by a whole number, we multiply the numerator by the whole number and keep the denominator the same. • _____ lot(s) of _____ is equal to _____. E.g. 3 x $\frac{1}{5}$ = 3 lots of 1 fifth = 3 fifths OR $\frac{1}{5}$ x 3 = $\frac{1}{5}$ 3 times.

Subject area	Year Five			Year Six		
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	Decimal, Fractions, Mixed Number, fractions, Proper, Improper, Equivalent		children are confident with both). **Mixed Numbers on a Number Line.** • There are ____ equal parts between zero and one. This means we are counting in units of ____. • The line is divided into ____ equal parts. Each interval represents ____. This allows us to count in ____. • ___ is in between ___ and ___. E.g. $1\frac{1}{3}$ is in between *1* and *2*. **Comparing Mixed Numbers** (See also 'Comparing Fractions.') • When comparing mixed numbers, *look to the whole number first.* • If the whole number is the same, then look to the fractional part. **Partitioning Mixed Numbers** • I can partition ____ into ____ and ____. E.g. I can partition $1\frac{4}{5}$ into ____ and _____ (OR ___ and ___and ____). **Adding Mixed Numbers** – Same Denominator (not crossing whole numbers) **Adding and Subtracting a Mixed Number to/from a Proper Fraction** • The parts are ____ and ____. The total or whole is	Mixed Number, fractions, Proper, Improper, Equivalent Multiplicative relationship, Simplified, Cancel (a fraction), Common denominator, Non-related fractions, Operator		Also, link back to earlier stem sentences based around unitising: • Our unit is fifths. I know 3x1=3, so I know 3x1 fifth is equal to three fifths. • To multiply a mixed number by a whole number: First, we partition (into wholes and fractional parts). Then, we multiply the number of wholes by the whole number. Then, we multiply the numerator by the whole number and keep the denominator the same. When a whole number is multiplied by a mixed number, it makes the whole number *bigger*. **Scaling Down** E.g. $\frac{1}{5}$ x 15 (**1x** means **1 of** 15, so $\frac{1}{5}$ x 15 means $\frac{1}{5}$ of 15). • ____ is divided into ____ equal parts; each part is $\_^{1}$ of the whole. $\_^{1}$ of ____ = ____ E.g. *15* is divided into *5* equal parts; each part is $\frac{1}{5}$ of the whole. $\frac{1}{5}$ of *15* = *3.* • When a whole number is multiplied by a unit fraction, It makes the whole number *smaller*. **Finding Equivalent Fractions and Simplifying Fractions** • The whole is divided into ____ equal parts and we have ____ of those parts. • Sometimes two fractions have the same value. We call these equivalent fractions.

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			_____. E.g. The parts are $\frac{2}{5}$ and $1\frac{1}{5}$. The total or whole is $1\frac{3}{5}$. Link to known facts: • I know that $\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$,so I know that $1\frac{2}{5} + \frac{1}{5} = 1\frac{3}{5}$. **Adding 2 Mixed Numbers** – Same Denominator (not crossing whole numbers) E.g. $1\frac{2}{5} + 2\frac{1}{5} = 3\frac{3}{5}$. • First, partition the whole numbers and the fractional parts. • Then, add the whole numbers. • Then, add the fractional parts. • Then, recombine. **Subtracting Mixed Numbers** – Same Denominator (not crossing whole numbers) E.g. $5\frac{4}{5}$ minus $2\frac{2}{5}$. • First, partition the whole numbers and the fractional parts. • Then, subtract the whole numbers. • Then, subtract the fractional parts. • Then recombine. Augmentation and reduction methods on a number line. E.g. $1\frac{2}{5} + 2\frac{1}{5} = 3\frac{3}{5}$. • First, write largest number on number line: $2\frac{1}{5}$.			• The numerator has been scaled up/down by _____. • The denominator has been scaled up/down by _____. These fractions are/are not equivalent. • When the numerator and denominator are multiplied or divided by the same number, the value of the fraction remains the same. • A fraction can be simplified when the numerator and denominator have common factors other than one. • To write a fraction in its simplest form, divide both the numerator and denominator by their highest common factor. **Adding and Subtracting Using Common Denominators** • Related fractions have denominators where one denominator is a multiple of the other. • _____ and _____ are related fractions because the denominator, _____, is a multiple of the other denominator. • To add or subtract fractions with different denominators, first <u>*convert them to fractions with a common denominator*</u>. • We can find a common denominator for two non-related fractions by <u>*multiplying their denominators*</u>. E.g. $\frac{3}{5} + \frac{4}{7}$ • Our units are …. <u>*not the same*</u>, so we need to find a common denominator.

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			• Then, add whole number: $2\frac{1}{5}$ + 1= 3 $\frac{1}{5}$. • Then, add fractional parts: $3\frac{1}{5}$ + $\frac{2}{5}$ = 3 $\frac{3}{5}$ **Improper Fractions** • In an improper fraction, the numerator is always *greater (bigger)* than the denominator. • When the numerator is *greater* than the denominator, the number is greater than one. • The denominator is _____. This means that each whole has been split into _____ equal parts. _____ make each whole. • The numerator is _____. This means there are _____ equal parts. E.g. Each whole is divided into *three* equal parts. We have *14* of these equal parts. This represents *14 thirds.* **Converting Improper Fractions to Mixed Numbers** • Our unit is __, so we will be thinking about groups of ___. • Each group of ___-___ represents *one whole*. • We can make _____ full groups of ___-___ and there are _____ more _____, so that is _____ . E.g. To convert $\frac{14}{3}$ to a mixed number:			• They are related fractions, so I can use a denominator of ___. OR: • They are not related fractions, so I will find a common denominator *by multiplying their denominators*. • They are not related fractions, so I will find the lowest common denominator by *counting in multiples of the highest denominator*. **Comparing Fractions with Different Denominators** • Before using common denominator methods to compare, first use knowledge of fractions with previous stem sentences to compare through reasoning. E.g. Order the following: $\frac{6}{5}$ $\frac{1}{7}$ $\frac{1}{5}$ • I know that 1/7 is smaller than 1/5 because when the numerators are the same, the greater the denominator, the smaller the fraction • 6/5 is the largest because when the numerator is larger than the denominator, the number is greater than one. **Multiplying Fractions** • When mutliplying unit fractions, the product is smaller than the fractions being multiplied. • To multiply fractions, we can multiply the numerators and multipy the denominators. **Dividing Fractions by a Whole Number** • To divide a fraction by a whole number, we can change it to an equivalent multiplication. • To divide by _____, we can multiply by ___. E.g. To divide by 2, we can multiply by .

Subject area	Year Five			Year Six		
	Previous Vocabulary	Year 5 Vocabulary	Stem Sentences	Previous Vocabulary	Year 6 Vocabulary	Stem Sentences
			• Our unit is *thirds*, so we will be thinking about groups of *3*. • Each group of *3 thirds* represents *one whole*. • We can make *4* full groups of *three - thirds* and there are *2* more *thirds*, so that is 4 $\frac{2}{3}$. Leading to: • To convert an improper fraction to a mixed number, *divide the numerator by the denominator* to find the whole number and the remainder is *the fractional part*. **Converting Mixed Numbers to Improper Fractions** • Our unit is __, so we will be thinking about groups of ___. • There are ___ wholes, so there are __ wholes with __ parts, which is ___ ____. • Then, there are ___more _____, so that is ___ _____*in total.* E.g. 4 $\frac{2}{3}$. • Our unit is *thirds,* so we will be thinking about groups of *3* (thirds). • There are *4* wholes, so there are *4* wholes with *3* parts, which is *12 thirds.* • Then, there are *2* more thirds, so that is *14 thirds* in total. Leading to: • To convert a mixed number to an improper fraction, *multiply the whole number by the fractional unit*			• If the numerator is a multiple of the divisor, it can be solved *with the unitising method.* E.g. 6÷3=2, so 6 tenths divided by 2=3 tenths; 6 eighths divided by 3= 2 eighths etc. • If the numerator is not a multiple of the divisor, *the calculation must be solved by conversion to an equivalent multiplication.* **Linking Fractions, Decimals and Percentages** **Decimal and Fraction Equivalence.** • 0.25 is equivalent to one quarter; one quarter is equivalent to 0.25. • 0.5 is equivalent to one half; one half is equivalent to 0.5. • 0.75 is equivalent to three quarters; three quarters is equivalent to 0.75. **Comparing Decimals and Fractions** To compare decimals and fractions, use this format: • _____is equivalent to ___(fraction). • We know that _____ < , so __.__ < _____ E.g. To compare 0.6 and $\frac{4}{5}$: • 0.6 is equivalent to $\frac{3}{5}$, • We know that $\frac{3}{5} < \frac{4}{5}$, so 0.6 < $\frac{4}{5}$. **Fraction and Percentage Equivalence.** • 25% is equivalent to *one quarter;* one quarter is equivalent to *25%.* • 50% is equivalent to *one half;* one half is equivalent to *50%.*

Subject area	Year Five			Year Six		
	Previous Vocabulary	Year 5 Vocabulary	Stem Sentences	Previous Vocabulary	Year 6 Vocabulary	Stem Sentences
			to find out the whole number,then <u>*add on any fractional parts*</u>. • The part and the whole are ___. The total is ____. • We multiply by ___ to convert mixed numbers to improper fractions: $4\frac{1}{6}$ is 4 groups of $\frac{6}{6}$, plus $\frac{1}{6}$. • We divide by __ to convert improper fractions into a mixed numbers. E.g. $\frac{20}{6}$: 20 divided into groups of 6 is 3 groups with 2 remaining, which is $3\frac{2}{6}$. **Addition and Subtraction of Proper Fractions (Same Denominator, Crossing One)** **Unitising Method** • Build on unitising method used for addition and subtraction without crossing one, then convert improper fraction to a mixed number. **Addition** E.g. $\frac{4}{6} + \frac{5}{6}$ • Our units is sixths. I know 4 + 5 is 9, so I know $\frac{4}{6} + \frac{5}{6} = \frac{9}{6}$ which is equal to $1\frac{3}{6}$ (or $1\frac{1}{2}$). **Subtraction** E.g. $1\frac{2}{6} - \frac{5}{6}$ • Our unit is sixths. I know 1 is equal to $\frac{6}{6}$, so $1\frac{2}{6}$ is equal to $\frac{8}{6}$. $\frac{8}{6} - \frac{5}{6} = \frac{3}{6}$.			• 75% is equivalent to <u>*three quarters; three*</u> quarters is equivalent to <u>75</u>%. **Converting Percentages to Fractions** • To convert a percentage to a fraction, first <u>*convert it to a fraction with a denominator of 100.*</u> **Finding Percentages** • To find 50% of a number, halve it. • To find 25% of a number, quarter it. • To find 10% of a number, divide it by 10. • To find 1% of a number, divide it by 100.

Subject area	Year Five			Year Six		
	Previous Vocabulary	Year 5 Vocabulary	Stem Sentences	Previous Vocabulary	Year 6 Vocabulary	Stem Sentences
			Bridging Method (Also show these methods on a number line) **Addition (Augmentation)** E.g. $\frac{4}{6} + \frac{5}{6}$ $\frac{2}{6}$ $\frac{3}{6}$ • Our unit is sixths. I know that 6 sixths is equal to 1. $\frac{4}{6}$ plus $\frac{2}{6}$ is equal to 1, so partition the $\frac{5}{6}$ into $\frac{2}{6}$ plus $\frac{3}{6}$. Then, $\frac{4}{6}$ plus $\frac{2}{6}$ = $\frac{6}{6}$ or 1 1 plus $\frac{3}{6}$ is equal to 1 $\frac{3}{6}$. **Subtraction (Reduction)** E.g. 1 - $\frac{3}{6}$; 2- $\frac{3}{6}$ etc • I know that one whole is equal to 6 sixths, so $\frac{6}{6}$ minus $\frac{3}{6}$ is equal to $\frac{3}{6}$. E.g. 1 $\frac{2}{6}$ $\frac{5}{6}$ - $\frac{2}{6}$ $\frac{3}{6}$ • Our unit is sixths. I know I need to subtract $\frac{2}{6}$ to reach 1, so partition the $\frac{5}{6}$ into $\frac{2}{6}$ and $\frac{3}{6}$. Then, 1 $\frac{2}{6}$ minus $\frac{2}{6}$ is equal to 1. I know that one whole is equal to 6 sixths, so $\frac{6}{6}$ minus $\frac{3}{6}$ is equal to $\frac{3}{6}$.			

Subject area		Year Five			Year Six		
		Previous Vocabulary	Year 5 Vocabulary	Stem Sentences	Previous Vocabulary	Year 6 Vocabulary	Stem Sentences
				Subtraction as Difference (show on a number line and a bar model) E.g. 1 $\frac{2}{5}$ - $\frac{4}{5}$ • I start at $\frac{4}{5}$ and I need one more fifth to reach $\frac{5}{5}$ or 1. Then, one and two more one fifths is equal to 1 $\frac{2}{5}$ **Addition and Subtraction of Improper Fractions (Same Denominator)** • As above with improper fractions, then use stem sentences for conversion between improper fractions and mixed numbers. E.g. $\frac{8}{6}$ + $\frac{3}{6}$ • Our unit is sixths. I know 8+3=11, so I know that $\frac{8}{6}$ plus $\frac{3}{6}$ is equal to $\frac{11}{6}$. Because our unit is sixths, we will be thinking about groups of 6. • There is one group of 6 and 5 more sixths, so that is 1 $\frac{5}{6}$.			
Geometry	2d Shape	Squares, Circles, Triangles, 2 dimensional, Polygon, Quadrilateral, Squares, Circles Triangles, Rectangle (Oblong), Kite, Hexagon, Heptagon, Octagon, Sides, Corners,	Base Perpendicular height Parallelogram Equilateral Isosceles Scalene Reflection symmetry	<u>Graphing</u> • When the y-coordinate is negative, the point is positioned below the x-axis. • When the y-coordinate is zero, the point is positioned on the x-axis. • When the x-coordinate is negative, the point is	Squares, Circles, Triangles, 2 dimensional, Polygon, Quadrilateral, Squares, Circles Triangles, Rectangle (Oblong), Kite, Hexagon, Heptagon, Octagon, Sides, Corners, Line of symmetry, Regular,		**Scale Factors with Shapes** • The length of one of the sides of square A is 2 times the length of one of the sides of square B. • The side-length of square B is one half times the side-length of square A. • To change shape A into shape B, scale the side-lengths by a scale factor of ___.

Subject area		Year Five			Year Six		
		Previous Vocabulary	Year 5 Vocabulary	Stem Sentences	Previous Vocabulary	Year 6 Vocabulary	Stem Sentences
		Line of symmetry, Regular, Irregular, Nonagon, Decagon, Perimeter, Units of length, Regular polygon, Irregular polygon, Rhombus, Trapezium, Orientation, Dodecagon, Octahedron, Area, Surface, Square units, Square centimetres, Square metres, Composite shape, Composite rectilinear shape, Line of symmetry, Quadrilaterals		positioned to the left of the y-axis. • When the x-coordinate is zero, the point is positioned on the y-axis.	Irregular, Nonagon, Decagon, Perimeter, Units of length, Regular polygon, Irregular polygon, Rhombus, Trapezium, Orientation, Dodecagon, Octahedron, Area, Surface, Square units, Square centimetres, Square metres, Composite shape, Composite rectilinear shape, Line of symmetry, Quadrilaterals, Base, Perpendicular height, Parallelogram, Equilateral, Isosceles, Scalene, Reflection, symmetry		• If the scale factor is greater than one, the shape is made larger. We can say the shape is enlarged. • If the scale factor is equal to one, the shape is the same size. • If the scale factor is less than one, the shape is made smaller. We can say the shape is reduced. • When a shape has been transformed by a scale factor, the perimeter is also transformed by the same scale factor. Introduction of Ratio • The ratio of the dimensions of shape A to the dimensions of shape B is equal to ___ to ___. • We write this as ___:___. • To change shape ___ into shape ___, scale the dimensions by a scale factor of ___.
	3d shape	Cube, Pyramid, Sphere, Cone, 3 dimensional, Cube, Pyramid, Sphere, Cone Triangular prism, Cuboid, Cylinder, Face Edges, Vertices, Vertex, Surface, Base Straight, Curved, Flat, Dodecahedron, Tetrahedron	2D representations Net	**Multiplication with Three Factors and Volume** • The amount of space the _____ takes up is its volume. • The __ has a larger volume than the __. • The __ has a larger volume than the __ because it occupies more space. • You can measure volume in cubic centimetres. You write this as cm^3. • This shape has a volume of _____ cm^3. • You can measure volume in cubic metres. You write this as m^3. • This layer has <u>3</u> rows of <u>3</u> cubes. • There are <u>*nine*</u> $1cm^3$ cubes in this layer.	Cube, Pyramid, Sphere, Cone, 3 dimensional, Cube, Pyramid, Sphere, Cone Triangular prism, Cuboid, Cylinder, Face Edges, Vertices, Vertex, Surface, Base Straight, Curved, Flat, Dodecahedron, Tetrahedron, 2D representations, Net	Radius Circumference Diameter	**Area and Perimeter** • The distance around the edge of the ___ is its perimeter. (Use real life examples of any flat shape). • Shapes can have the same perimeter but different areas. • Shapes can have the same area but different perimeters. • To find the area of a rectangle multiply the length by the width. • A rectangle can be made into a parallelogram that has the same area. • A parallelogram can be made into a rectangle that has the same area. • A parallelogram is a quadrilateral with opposite sides that are parallel and equal in length. • A _____ is a parallelogram because ___. • To find the area of a parallelogram multiply the base by the perpendicular height. The base is ___. • The perpendicular height is ___.

Subject area		Year Five			Year Six		
		Previous Vocabulary	Year 5 Vocabulary	Stem Sentences	Previous Vocabulary	Year 6 Vocabulary	Stem Sentences
				• This layer has a volume of <u>9</u> cm^3. • There are <u>2</u> layers of <u>9</u> cm^3; 2 x 9 = 18 (or 2 x 3 x 3 = 18). • The volume of the cuboid is <u>18</u> cm^3. Generalisations: • The volume of the cuboid can be found by multiplying <u>the length by the width by the height</u>. • We know the width is ___, we know the length is __, we know the height is __. To find the volume we can write this as __ x __ x __ = volume. • We know the width is __, we know the length is ___, we know the volume is ___. To find the height we can write ____ x ? x ___ = ___. • We can split the compound shape into ___ and ___. We know that … (repeat steps above). • The _____ (number) refers to the _____ (columns; rows; trays, layers etc.). Generalisations: • If you change the order of the factors, the product <u>remains the same.</u> • When we multiply three numbers, the product will be the same whichever pair we multiply first.			• The area is ___. • To find the perpendicular height, divide the area by the base. • To find the base, divide the area by the perpendicular height. • A triangle is a 2D shape with ___ sides and ___ angles. It can be classified by the length of its sides and the size of its angles. • Equilateral triangles have three equal sides and three equal angles. • Isosceles triangles have two equal sides and two equal angles. • Scalene triangles have no equal sides and no equal angles. • Right-angled isosceles triangles have two equal sides, two equal angles and a right angle. • Right-angled scalene triangles have no equal sides, no equal angles and a right angle. • We can count squares to find the area of a triangle. • The area is ___ square units. • To find the area of a triangle multiply the base by the perpendicular height and then divide by two. The base is ___. • The perpendicular height is ___. • The area is ___. • Two right-angled triangles that are the same can be joined to make a rectangle. • A rectangle can be divided into two right-angled triangles. • Two triangles that are the same can be joined to make a parallelogram. • A parallelogram can be divided into two triangles.

Subject area		Year Five			Year Six		
		Previous Vocabulary	Year 5 Vocabulary	Stem Sentences	Previous Vocabulary	Year 6 Vocabulary	Stem Sentences
	Angles	Right angle, Degree, Half turn Full turn Turn Parallel Perpendicular Horizontal Vertical, Acute, Obtuse	360 degrees 180 degrees Reflex	**Angles** • A quarter of a turn is ____ right angle. • A half a turn is ____ right angles. • A full turn is ____ right angles. • Right angles are equal to 90 degrees. • Acute angles are smaller than 90 degrees. • Obtuse angles are greater than 90 degrees. • Reflex angles are greater than 180 degrees but less than 360 degrees. • Angles in a triangle total 180 degrees. • Angles in a quadrilateral total 360 degrees. • Angles around a point total 360 degrees. • Adjacent angles on a straight line total 180 degrees. • Vertically opposite angles are equal.	Right angle, Degree, Half turn Full turn Turn Parallel Perpendicular Horizontal Vertical, Acute, Obtuse, 360 degrees, 180 degrees, Reflex		
	Positioning & Direction	Half turn, Quarter turn, Three quarter turn, Direction, Rotation, Coordinates, Quadrant, Translation, Left, Right, Up, Down, Plot	Quadrant Coordinates Negative numbers Translation		Half turn, Quarter turn, Three quarter turn, Direction, Rotation, Coordinates, Quadrant, Translation, Left, Right, Up, Down, Plot, Negative numbers, Translation	Four quadrants Reflection Coordinate plane	
Measure	Time	Quicker, Slower, Earlier, Later, Today, Yesterday, Tomorrow, Quicker, Slower, Earlier, Later, Hour, Minute Hand, Clock face, O'clock, Half past,			Quicker, Slower, Earlier, Later, Today, Yesterday, Tomorrow, Quicker, Slower, Earlier, Later, Hour, Minute Hand, Clock face, O'clock, Half past, 30 minutes past,		

Subject area		Year Five			Year Six		
		Previous Vocabulary	Year 5 Vocabulary	Stem Sentences	Previous Vocabulary	Year 6 Vocabulary	Stem Sentences
		30 minutes past, Chronological, Second, Minute, Hour Day, Week, Month, Year Quarter past, Quarter to, Minutes past, Minutes to, Late, Early On time, Clockwise, Anti-clockwise, AM – ante-meridiem, PM – post-meridiem, Morning, Afternoon, Noon, Midnight, Digital , Analogue, Rate			Chronological, Second, Minute, Hour Day, Week, Month, Year Quarter past, Quarter to, Minutes past, Minutes to, Late, Early On time, Clockwise, Anti-clockwise, AM – ante-meridiem, PM – post-meridiem, Morning, Afternoon, Noon, Midnight, Digital , Analogue, Rate		
	Money	Coin, Note, Pound, Pence, Denomination, Change			Coin, Note, Pound, Pence, Denomination, Change		
	Length & Height	Long, Short, Longer, Shorter, Tall, Short, Double, Half, Length, Height Breadth, Longest, Shortest, Tall, Short, Taller, Shorter, Tallest, Shortest, Double, Half Metre, Centimetre, Kilometre, Milli, Millimetre, Ruler, Metre stick, Tape measure, convert	Foot Yard Mile Acre	•	Long, Short, Longer, Shorter, Tall, Short, Double, Half, Length, Height Breadth, Longest, Shortest, Tall, Short, Taller, Shorter, Tallest, Shortest, Double, Half Metre, Centimetre, Kilometre, Milli, Millimetre, Ruler, Metre stick, Tape measure, convert, Foot, Yard, Mile, Acre		**Structures Using Measures and Comparison to Understand Scaling** • The ___ is ___ times the length of __. • When one is a factor, the product is equal to the other factor. • If 2 objects are the same length, one object is one times the length of the other. • ___is __ times the size of ___. • ___ multiplied by ___ is equal to ___. • ___ is ___ times the size of ___. • ___ divided by ___ is equal to ___. • The ___ is ___ times the mass of the ___.
	Mass & Weight	Heavy, Light, Heavier, Lighter, Weight, Mass, Scales	Ounce Pound Stone Hundredweight		Heavy, Light, Heavier, Lighter, Weight, Mass, Scales		

Subject area		Year Five			Year Six		
		Previous Vocabulary	Year 5 Vocabulary	Stem Sentences	Previous Vocabulary	Year 6 Vocabulary	Stem Sentences
		Kilo, Kilogram, Gram, convert	Ton		Kilo, Kilogram, Gram, convert, Ounce, Pound, Stone, Hundredweight, Ton		
	Capacity & Volume/Temperature	Full, Empty, Half full, Half empty, Volume Capacity, Litres, Centilitres, Millilitres, Measuring vessels, Temperature, Degrees, Boiling point, Freezing point, convert	Gallon Pint Quart		Full, Empty, Half full, Half empty, Volume Capacity, Litres, Centilitres, Millilitres, Measuring vessels, Temperature, Degrees, Boiling point, Freezing point, convert, Gallon, Pint, Quart		
Statistics	Graphs and Charts	Interpret, Construct, Pictograms, Tally charts, Block diagrams, Simple tables, Category, Quantities, Categorical data, Horizontal , Vertical, Data, Frequency, Tally, present, Discrete data, Continuous data, Time graphs, x-axis, y-axis, Title, Legend, Sample	Timetables Rows Columns x-axis y-axis Title Legend		Interpret, Construct, Pictograms, Tally charts, Block diagrams, Simple tables, Category, Quantities, Categorical data, Horizontal , Vertical, Data, Frequency, Tally, present, Discrete data, Continuous data, Time graphs, x-axis, y-axis, Title, Legend, Sample, Timetables, Rows, Columns	Pie charts Line graphs Compass	

Subject area		Year Five			Year Six		
		Previous Vocabulary	Year 5 Vocabulary	Stem Sentences	Previous Vocabulary	Year 6 Vocabulary	Stem Sentences
Algerba	Equations, formulae, sequences	Integer scaling	Deduce		Integer scaling, Deduce	Express Algebraically Enumerate Formulae Linear number sequences Equation Inequality Formula Identity Expression Equivalent expression Evaluate Natural number (N) Nth term of a sequence Ratio notation	

Five Stones Learning Federation
Year 5 - NRICH Activities

Number	Measurement	Geometry	Statistics
Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero **NRICH:** Tug Harder! * G **NRICH:** Swimming Pool* P **NRICH:** Sea Level * P I	Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres **NRICH:** Area and Perimeter * I **NRICH:** Through the Window * I	Draw given angles, and measure them in degrees (°) **NRICH:** The Numbers Give the Design * I **NRICH:** Six Places to Visit * P **NRICH:** How Safe Are You? * P **NRICH:** Olympic Turns *** P	
Addition and Subtraction			
Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why **NRICH:** Twenty Divided Into Six ** P **NRICH:** Reach 100 *** P **NRICH:** Maze 100 ** P **NRICH:** Six Ten Total ** P I **NRICH:** Six Numbered Cubes ** P	Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes **NRICH:** Numerically Equal ** P **NRICH:** Shaping It * I **NRICH:** Cubes * P I **NRICH:** Fitted *** P **NRICH:** Brush Loads * P I **NRICH:** Making Boxes ** I **NRICH:** Ribbon Squares *** P	Distinguish between regular and irregular polygons based on reasoning about equal sides and angles **NRICH:** Egyptian Rope ** P I **NRICH:** Bracelets * I	
Multiplication and Division			
Identify multiples and factors, including all factor pairs of a number, and common factors of two numbers **NRICH:** Sweets in a Box * P I **NRICH:** Which Is Quicker? * P **NRICH:** Multiplication Squares * P I **NRICH:** Flashing Lights * P **NRICH:** Abundant Numbers * I **NRICH:** Factor Track ** G P **NRICH:** Factors and Multiples Game * G **NRICH:** Pebbles ** I **NRICH:** Three Dice * P		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 **NRICH:** Transformations on a Pegboard * P **NRICH:** More Transformations on a Pegboard ** P I	
Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers **NRICH:** Two Primes Make One Square ** I			
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 **NRICH:** All the Digits ** P **NRICH:** Trebling * P			
Divide numbers up to 4 digits by a one-digit number using the formal written method of			

Number	Measurement	Geometry	Statistics
short division and interpret remainders appropriately for the context **NRICH:** Division Rules *** P I**			
Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 **NRICH:** Multiply Multiples 1 *** P** **NRICH:** Multiply Multiples 2 *** P** **NRICH:** Multiply Multiples 3 *** P**			
Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}) **NRICH:** Up and Down Staircases *** P** **NRICH:** One Wasn't Square **** P** **NRICH:** Cycling Squares **** P** **NRICH:** Picture a Pyramid … **** P**			
Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes **NRICH:** Curious Number ***** P I** **NRICH:** Division Rules *** P I** **NRICH:** Odd Squares *** P** **NRICH:** Cubes Within Cubes ***** P**			
Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign **NRICH:** Make 100 **** P I** **NRICH:** Multiply Multiples 1 *** I** **NRICH:** Multiply Multiples 2 *** I** **NRICH:** Multiply Multiples 3 *** I** **NRICH:** Highest and Lowest *** P I** **NRICH:** Four Goodness Sake ***** P**			
Fractions, Decimals and Percentages			
Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. 2/5 + 4/5 = 6/5 = 1 1/5) **NRICH:** Balance of Halves *** P**			
Round decimals with two decimal places to the nearest whole number and to one decimal place **NRICH:** Round the Dice Decimals 2 *****			
Read, write, order and compare numbers with up to three decimal places **NRICH:** Greater Than or Less Than? *** I** **NRICH:** Spiralling Decimals ***** G**			

Number	Measurement	Geometry	Statistics
Solve problems involving number up to three decimal places **NRICH:** Route Product ** P I **NRICH:** Forgot the Numbers ** I			
Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, 1/5, 2/5, 4/5 and those fractions with a denominator a multiple of 10 or 25 **NRICH:** Matching Fractions Decimals Percentages * G			

Five Stones Learning Federation
Year 6 - NRICH Activities

Number	Measurement	Geometry	Statistics
Use negative numbers in context, and calculate intervals across zero **NRICH:** First Connect Three * G P	Recognise that shapes with the same areas can have different perimeters and vice versa **NRICH:** Dicey Perimeter, Dicey Area * G	Draw 2-D shapes using given dimensions and angles **NRICH:** Making Spirals *** P **NRICH:** Shape Draw * P **NRICH:** Baravelle * P	Interpret and construct pie charts and line graphs and use these to solve problems **NRICH:** Match the Matches ** P
Number and Place Value Solve number and practical problems that involve all of the above **NRICH:** Round the Four Dice * P I	Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3] **NRICH:** Next Size Up ** P	Recognise, describe and build simple 3-D shapes, including making nets **NRICH:** Cut Nets ** P **NRICH:** Making Cuboids ** P I	Calculate and interpret the mean as an average **NRICH:** Birdwatch * I
Multiplication and Division Perform mental calculations, including with mixed operations and large numbers **NRICH:** Exploring Number Patterns You Make ** P I **NRICH:** Become Maths Detectives * P I		Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons **NRICH:** Where Are They? * P **NRICH:** Quadrilaterals *** P I **NRICH:** Round a Hexagon * P **NRICH:** Always, Sometines or Never? Shape * P	
Identify common factors, common multiples and prime numbers **NRICH:** Mystery Matrix ** P I **NRICH:** Factor Lines ** P I **NRICH:** Factor-multiple Chains ** P **NRICH:** The Moons of Vuvv * P **NRICH:** Round and Round the Circle ** P I **NRICH:** Counting Cogs ** P			
Solve problems involving addition, subtraction, multiplication and division **NRICH:** Always, Sometimes or Never? Number * P		Describe positions on the full coordinate grid (all four quadrants) **NRICH:** Cops and Robbers * G **NRICH:** Coordinate Tan ** P **NRICH:** Ten Hidden Squares *** P	
Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy **NRICH:** Four Go * G			
Fractions, Decimals and Percentages Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts **NRICH:** Doughnut Percents * P			
Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts			

NRICH: Orange Drink ** P **NRICH:** Pumpkin Pie Problem ** P **NRICH:** Jumping * P **NRICH:** Rectangle Tangle * P **NRICH:** Fraction Fascination *** P			
Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison **NRICH:** Would you Rather? * P			
Algebra			
Generate and describe linear number sequences **NRICH:** Domino Sets * P I **NRICH:** Break it Up! * P I **NRICH:** Button-up Some More ** I **NRICH:** Holes * P I			
Express missing number problems algebraically **NRICH:** Plenty of Pens * P **NRICH:** Two and Two *** P I			

Five Stones Learning Federation

Key Instant Recall Facts (KIRFs) Progression Map

2020 to 2021

Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Reception	I know the number names in order to 5.	I know the numbers in order to 10.	I know the days of the week.	I can partition numbers to 5 into two groups	I can count in 10s.	I can count in 5s.
Y1	I know number bonds for each number to 6	I can count forward and backward in steps of 2,5 and 10	I know doubles and halves of numbers to 10.	I know number bonds to 10.	I know days of the week, months of the year and seasons	I know number bonds for each number to 10.
Y2	I know number bonds to 20.	I know the multiplication and division facts for the 10 times table.	I know doubles and halves of numbers to 20.	I know the multiplication and division facts for the 5 times table.	I know addition and subtraction facts for multiples of 10 to 100	I know the multiplication and division facts for the 2 times table.
Y3	I know number bonds for all numbers to 20.	I know the multiplication and division facts for the 4 times table.	I know the multiplication and division facts for the 8 times table	I know the multiplication and division facts for the 3 times table.	I can recall facts about durations of time.	I know doubles and halves of -All numbers to 20 -All multiples of 10 to 500 - All multiples of 100 to 5000.
Y4	I know number bonds to 100.	I know the multiplication and division facts for the 6 times table.	I can multiply and divide single-digit numbers by 10 and 100.	I know the multiplication and division facts for	I can recognise decimal equivalents of fractions.	I know doubles and halves of -All numbers to 50

				the 9 , 11 and 7 times tables.	I can convert between the 12 hour and 24 hour clock.	-All multiples of 5 to 1000 - All multiples of 50 to 5000.
Y5	I know decimal number bonds to 1 and 10.	I know the multiplication and division facts for all times tables up to 12 × 12 I can recall square numbers up to 12^2 and their square roots.	I can recall metric conversions.	I can identify prime numbers up to 20.	I know doubles and halves of -All numbers to 100 -All multiples of 10 to 10,000 - All multiples of 100 to 10,000.	I can find factor pairs of a number. I know the tests of divisibility for 2, 3, 5, 9 and 10.
Y6	I can use x table facts to multiply and divide decimals	I can identify common factors of a pair of numbers.	I can convert between decimals, fractions and percentages.	I can identify prime numbers up to 50.	I know doubles and halves of 2 digit decimals.	I know the tests of divisibility for 4 and 6.