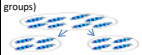
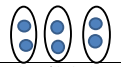
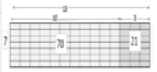
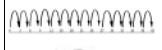
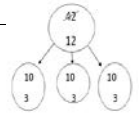
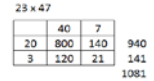
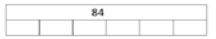
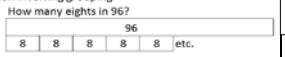
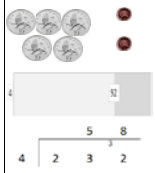
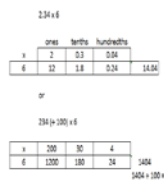
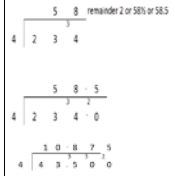
LEEK EDUCATION PARTNERSHIP **MULTIPLICATION AND DIVISION POLICY** **Apr-14**

	PLACE VALUE	MENTAL METHODS	WRITTEN METHODS	non statutory guidance	MULTIPLICATION	DIVISION	RESOURCES	SINGAPORE METHODS	NON NEGOTIABLES
Y1	count in multiples of twos, fives and tens	find half (from fractions)		They make connections between arrays, number patterns, and counting in twos, fives and tens.		find half of 8 sweets (divided into two groups) 	OBJECTS FOR SHARING	**1. Repeated Addition (Multiplication)** Mackenzie eats 2 rolls a day. How many rolls does she eat in 5 days? 2 + 2 + 2 + 2 + 2 = 10 2 X 5 = 10 She eats **10** rolls in 5 days.  **2. The Grouping Method (Division)** Mrs. Lee makes 14 sandwiches. She gives all the sandwiches equally to 7 friends. How many sandwiches does each friend receive?  14 ÷ 7 = 2 Each friend receives **2** sandwiches.	• Count in multiples of 2, 5 and 10 forwards and backwards to 100
Y2	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward - recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot	calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs	Pupils use a variety of language to describe multiplication and division.Pupils are introduced to the multiplication tables. They practise to become fluent in the 2, 5 and 10 multiplication tables and connect them to each other. They connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face. They begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations.Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition.	  Blank number lines - arrays - Enhance commutativity using arrays to reinforce 2 x 3 = 6 3 x 2 = 6 6 ÷ 3 = 2 6 ÷2 = 3	half of larger quantities eg half of 40. Practical work into groups of 3 (grouping) and three groups (sharing) Blank number lines - arrays - Enhance commutativity using arrays to reinforce 2 x 3 = 6 3 x 2 = 6 6 ÷ 3 = 2 6 ÷2 = 3 	counters blank number lines, numicon, straws, bead strings (for 5 and 10)		• To know and understand vocabulary for +, -, x, -:- and = • Recall x and -:- facts in the 2, 5 and 10 table (up to 12)
Y3	count from 0 in multiples of 4, 8, 50 and 100 - recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Written Methods)	write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Mental Methods)	Pupils continue to practise their mental recall of multiplication tables when they are calculating mathematical statements in order to improve fluency. Through doubling, they connect the 2, 4 and 8 multiplication tables. Pupils develop efficient mental methods, for example, using commutativity and associativity (for example, 4 × 12 × 5 = 4 × 5 × 12 = 20 × 12 = 240) and multiplication and division facts (for example, using 3 × 2 = 6, 6 ÷ 3 = 2 and 2 = 6 ÷ 3) to derive related facts (for example, 30 × 2 = 60, 60 ÷ 3 = 20 and 20 = 60 ÷ 3).	Grid method - practically using squared paper and place value counters or dienes or Numicon. Emphasis of multiplying by ten is moving across a column 	Emphasis of dividing by ten is moving across the columns. Link multiplication and division practically using number lines for grouping and 'jar' for sharing 42 ÷ 3 =  	squared grids place value counters, dienes numicon	**5. The model that involves multiples** Mrs. Drew buys 12 apples. She buys 3 times as many oranges as apples. She also buys 2 times as many cherries as oranges. How many pieces of fruit does she buy altogether?  12 × 12 = **156**	• Count on and back from any number in 2s,3s,4s,5s,8s,10s,50s and 100s up to 1000 • Rapid recall: 2x,3x,4x,5x,8x,10, tables and their inverses • Multiply a 2 digit by a 1 digit number • Multiply any 10s number by a 2,3,4,5,8 or 10 • Divide 2,3,4,5,8 and 10 into a 2 digit number (no remainder)
Y4	count in multiples of 6, 7, 9, 25 and 1 000 - recall multiplication and division facts for multiplication tables up to 12 × 12	use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers - recognise and use factor pairs and commutativity in mental calculations (appears also in Properties of Numbers) Pupils should have instant recall of the times tables to 12 x 12 showing precisioon and fluency	multiply two-digit and three-digit numbers by a one-digit number using formal written layout	Pupils practise recalling and using multiplication tables and related division facts to aid fluency.Pupils practise mental methods and extend this to three-digit numbers to derive facts, (for example 600 ÷ 3 = 200 can be derived from 2 x 3 = 6).Pupils write statements about the equality of expressions (for example, use the distributive law 39 × 7 = 30 × 7 + 9 × 7 and associative law (2 × 3) × 4 = 2 × (3 × 4)). They combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations for example, 2 x 6 x 5 = 10 x 6 = 60.	No need to move to column algorithmn except for more able in Y6 as grid support algebra continue to work practically and use grid methods 		squared grids, place value counters, dienes numicon	**Division involving sharing** 84÷6 =  **Division involving grouping** How many eights in 96?  **The model that involves creating a whole** Ellen, Giselle, and Brenda bake 111 muffins. Giselle bakes twice as many muffins as Brenda. Ellen bakes 9 fewer muffins than Giselle. How many muffins does Ellen bake?  (111 + 9) ÷ 5 = 24 (2 × 24) - 9 = **39** **The model that involves sharing** There are 183 tennis balls in Basket A and 97 tennis balls in Basket B. How many tennis balls must be transferred from Basket A to Basket B so that both baskets contain the same number of tennis balls?  183 - 97 = 86 86 ÷ 2 = **43**	• Count in multiples of 2,3,4,5,6,7,8,9,10,25,50,100 and 1000 from any given number • Recall multiplication and division facts for tables up to 12 x 12 • Multiply and divide 3 digit by a 1 digit number and show remainder when appropriate • Recognise what happens when dividing a 2 digit number by 10 and 100 • Know what happens when multiplying by 0 • Recognise and use factor pairs within 144 • Multiply and divide decimal fractions by 10 and 100
Y5	count forwards or backwards in steps of powers of 10 for any given number up to 1000000	multiply and divide numbers mentally drawing upon known facts - multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers - divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context	They apply all the multiplication tables and related division facts frequently, commit them to memory and use them confidently to make larger calculations. They use and understand the terms factor, multiple and prime, square and cube numbers. Pupils interpret non-integer answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding (for example, 98 ÷ 4 = ninety-eight quarters = 24 r 2 = 24 and a half = 24.5 ≈ 25. ninety-eight quarters = 24 r 2 = 24a half = 24.5 ≈ 25.They understand the terms factor, multiple and prime, square and cube numbers and use them to construct equivalence statements (for example, 4 x 35 = 2 x 2 x 35;Pupils use and explain the equals sign to indicate equivalence, including in missing number problems (for example, 13 + 24 = 12 + 25; 33 = 5 x).	No need to move to column algorithmn except for more able in Y6 as grid support algebra continue to use grid methods	division using base ten practical equipment eg coins, dienes, place value counters 52 ÷ 4 = 	squared grids, place value counters, dienes numicon		
Y6		perform mental calculations, including with mixed operations and large numbers - associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3/8) be able to calculate single digit by single digit decimal to two places eg. 6 x 0.06 = 0.36 (copied from Fractions)	multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication - divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context - use written division methods in cases where the answer has up to two decimal places (copied from Fractions (including decimals))	Pupils continue to use all the multiplication tables to calculate mathematical statements in order to maintain their fluencyPupils explore the order of operations using brackets; for example, 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9.Pupils should use a variety of images to support their understanding of multiplication with fractions. This follows earlier work about fractions as operators (fractions of), as numbers, and as equal parts of objects, for example as parts of a rectangle.Pupils use their understanding of the relationship between unit fractions and division to work backwards by multiplying a quantity that represents a unit fraction to find the whole quantity (for example, if one quarter of a length is 36cm, then the whole length is 36 × 4 = 144cm Pupils are introduced to the division of decimal numbers by one-digit whole number, initially, in practical contexts involving measures and money. They recognise division calculations as the inverse of multiplication.	No need to move to column algorithmn except for more able as grid support algebra most pupils to continue to use grid methods for decimals too. 			
	from new national curriculum	work on decimals and fractions needs to be completed in Years 1-4 before pupils begin calcuations with them see Fractions and Deciamls sections. Division intially is in the fractions section.			to be discussed with the middle/high schools which method or which first?	to be discussed with the middle/high schools which method short for decimal or compensation?			