LEEK EDUCATION PARTNERSHIP

ADDITION AND SUBT

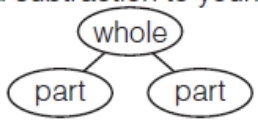
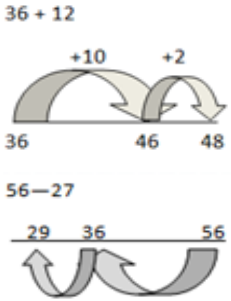
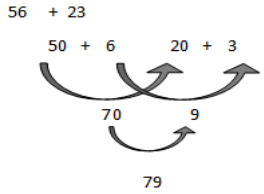
		PLACE VALUE	MENTAL METHODS	WRITTEN METHODS
R				
Y1	represent and use number bonds and related subtraction facts within 20	count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number - given a number, identify one more and one less - identify and represent numbers using objects and pictorial representations including the number line	add and subtract one-digit and two-digit numbers to 20, including zero	read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs
Y2	recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100	identify, represent and estimate numbers using different representations, including the number line - recognise the place value of each digit in a two-digit number (tens, ones) - Read and write numbers to 100 in words and numerals	add and subtract numbers mentally, including: three digit and ones, three digit and tens, two two digit numbers, three one digit numbers	show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot

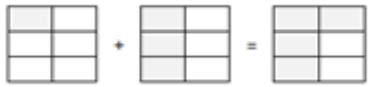
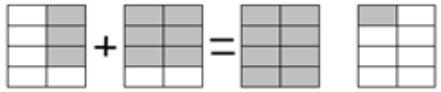
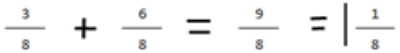
Y3		recognise the place value of each digit in a three-digit number (hundreds, tens, ones) - read and write numbers up to 1 000 in numerals and in words	add and subtract numbers including: three digit and ones, three digit and tens, three digit number and hundreds	add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction **add and subtract fractions with the same denominator within one whole (e.g. 5/7 + 1/7 = 6/7)**
Y4	***Decimals are introduced extensively in Y4, through the measures strand and money***	recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)		add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate **add and subtract fractions with the same denominator**

Y5	***Pupils should go beyond the measurement and money models of decimals, for example, by solving puzzles involving decimals.***	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit - recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (fractions)	add and subtract numbers mentally with increasingly large numbers	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) **add and subtract fractions with the same denominator and multiples of the same number** Adding and subtracting decimals (appears in non statutory guidance)
Y6	use their knowledge of the order of operations to carry out calculations involving the four operations	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit - identify the value of each digit to three decimal places(Fractions)	perform mental calculations, including with mixed operations and large number**s**	**add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions**

from new national curriculum

˙RACTION POLICY

				RESOURCES
Pupils have recall of all the number bonds to 10 and can calculate the number bonds to 20	A **number bond** shows the relationship in a simple addition or subtraction problem. The number bond is based on the concept "part-part-whole." This concept is useful in teaching simple addition and subtraction to young children.  To find a whole, students must add the two parts. To find a part, students must subtract the other part from the whole.			Numicon Money Bead Strings Straws
The place value of each digit in a two-digit number (tens, ones) investigated practically leading to Pupils have instant recall of all the number bonds to 20. Pupils know that if 1 + 8 = 9 then 31 + 8 = 39 and 41 + 8 = 49	using a number line 	not used in all schools 	Expanded column 34 + 12 30 4 10 2 + 40 6 equals 46	Numicon Money Bead Strings place value counters Straws

Fractions visually (egg box - numicon) 	com -7 -20 343 + 128 343 128 + 471	column subtraction no exchange 49 - 28 49 28 - 21		Numicon Money Bead Strings place value counters Dienes
Fractions visually (egg box - numicon)  		column subtraction and exchange 141 - 28 3 1 4 1 2 8 -		Numicon for fractions, cuisinaire for fractions, egg boxes (to discourage the add the top and then add the bottom error.)

$\frac{1}{2} + \frac{3}{8} =$ $\frac{4}{8} + \frac{3}{8} = \frac{7}{8}$ Adding and subtracting decimals lining up the decimal point and therefore the columns	$\begin{array}{r} 2.56 \\ 3.7 \\ \hline 6.26 \\ {\scriptstyle 1} \end{array} +$ $\begin{array}{r} {\scriptstyle 7}\,{\scriptstyle 1} \\ 3.\not{8}\,0 \\ 2.51 \\ \hline 1.29 \end{array} -$			Numicon for fractions, cuisinaire for fractions, egg boxes
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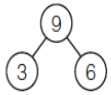
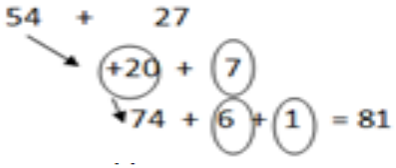
Apr-14

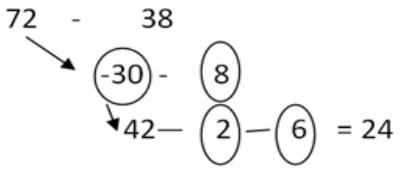
SINGAPORE METHODS	NON NEGOTIABLES
	• Know number bonds up to 10 e.g. 4+3=7, 5-2=3 • Count forward to 50 and begin to count backwards • Read, write and order numbers to 20 • Odd and even numbers to 10 (using Numicon) • Find missing numbers in a sequence 0-20 • Doubles up to 5+5=10 • One more than, one less than a number up to 20 • To add single digit numbers together e.g. 3+2=5, 3+2+1=6, 5=3+2 • To subtract a single digit from 10
1. Number Bond (single digits)  3 (part) + 6 (part) = **9** (whole) 9 (whole) – 3 (part) = **6** (part) 9 (whole) – 6 (part) = **3** (part) **2. Addition Number Bond (single digits)** **Addition number bonds** (2 digit) 54 + 27	• Count in 1's from any number between 0-100 forwards and backwards • Read and write numbers to 100 • Read and write words 0-20 • Odd and even numbers to 50 • Find missing numbers in a sequence 0-100 • Doubles to 10+10=20 • Know by heart number bonds up to and including 10 e.g. 2+5=7, 4+3=7, 4+6=10, 10-6=4 • Know one more than and one less than a number up to 100 • Add and subtract 2 numbers up to 20 e.g. 15+2=17, 17=15+2, 17=15+? • Add 3 numbers up to 20 • Know vocabulary and signs for +, - and =
	• Read, write and order numbers to 100, odd and even numbers to 100 • Understand place value with 2 digit numbers • Know 10 more than and 10 less than any number to 100 • Understand greater than > and less than < and use signs • Use inverse to check answers (addition and subtraction)e.g 6+4=10 so 10-4=6 • Know and use + and – facts up to and including 20 including 6+4 = 8+2 • Add and subtract using 1 and 2 digit numbers and written methods (no carrying) • Add and subtract mentally –2 digit + 1 digit, 2 digit +10, 2 digit + 2 digit • To know and understand vocabulary for +, -, and = Solve word problems with +- • Recognise, name and write fractions ½, ¼, ¾, 1/3, 2/3 Begin to calculate fractions
	• Read and write and order numbers to at least 1000



ten first.

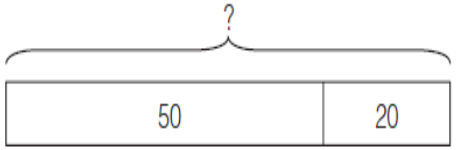
Subtraction bonds (2 digit)

72 - 38



1. The model that involves addition

Melissa has 50 blue beads and 20 red beads. How many beads does she have altogether?



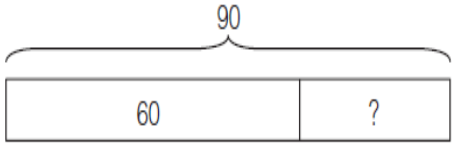
50 + 20 = **70**

- Recognise place value of all numbers in a 3 digit number
- Know 100 more or less than any number up to 1000
- Add and subtract 3 digit numbers using column method
- Know pairs of fractions that add up to 1
- Find ½, ¼, 1/5 of a 2digit number
- Order fractions from ½ to 1/12
- Know equivalent fractions ½, ¼, 1/5 and 1/10
- Add and subtract 2 fractions with the same denominator
- Rapid recall: Add 3 digit to a 1 digit; to a 10s number; and to a 100s number
- Rapid recall: Subtract a 1 digit from a 3 digit number; a 10s number and a 100s number

- Read and write and order numbers to at least 10000
- Recognise place value of all numbers in a 4 digit number
- Round any number to the nearest 10 or 100
- Add together 4 digit numbers using formal written method
- Subtract 4 digit numbers using formal written method
- Recognise, write and order decimal equivalents to ½, ¼, 1/5 and any tenths and hundredths
- Add and subtract fractions with the same denominator (within 1)
- Write equivalent fractions given denominator or numerator
- Estimate the answer to additions and subtractions with a 3 digit number

2. The model that involves subtraction

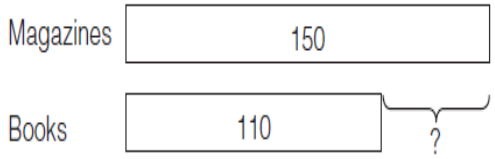
Ben and Andy have 90 toy cars. Andy has 60 toy cars. How many toy cars does Ben have?



90 – 60 = **30**

3. The model that involves comparison

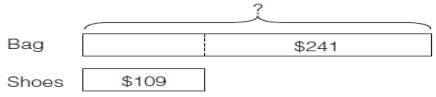
Mr. Simons has 150 magazines and 110 books in his study. How many more magazines than books does he have?



150 – 110 = **40**

4. The model that involves two items with a difference

A pair of shoes costs $109. A leather bag costs $241 more than the pair of shoes. How much is the leather bag?



$109 + $241 = **$350**

Count backwards through zero to include negative numbers
Find 1000 more or less than a number
Round any number to the nearest 1000
Use rounding to check answers
Understand and use inverse operations
Add or subtract mentally with increasingly large numbers eg 12 462 – 2 300
Read and write numbers up to one million
Count forwards and backwards in steps of powers of ten for any number up to one million
Add and subtract numbers with more than 4 digits
Recognise mixed numbers and improper fractions and convert from one to another
Add and subtract fractions with the same denominator
Mentally add and subtract tenths and 1 digit whole numbers and tenths eg 18 0.6 24 – 0.4 27.1 – 0.7
Fraction and decimal complements to 1
Written methods for adding and subtracting numbers with up to 3 decimal places

Add and subtract fractions with different denominators and mixed numbers