Liscard Primary School Calculation Policy

Addition and Subtraction

	MENTAL CALCULATION					
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Subitise numbers to 5. Begin to conceptually subitise numbers to 10. Say 1 more and 1 less than a given number to 10. add and subtract two single digit numbers by automatically recalling number bonds. **e.g. 3 + 2** The children will automatically recall bonds to 5 and some bonds to 10 (including subtraction facts)	add and subtract one-digit and two-digit numbers to 20, including zero **7 – 3** Using a 10 frame to subtract - The children may subitise how many are remaining without having to count them all.	add and subtract numbers using concrete objects, pictorial representations, and mentally, including: * a two-digit number and ones * a two-digit number and tens * two two-digit numbers * adding three one-digit numbers **Special cases** When subtracting 9 or 19 28 – 9 28 – 10 + 1	add and subtract numbers mentally, including: * a three-digit number and ones * a three-digit number and tens * a three-digit number and hundreds **Partitioning** eg: **55 + 78** 70 + 50 = 120 8 + 5 = 13 120 + 13 = 133 or 78 + 50 = 128 128 + 2 + 3 = 133 **Special cases** **66 + 79** 80 + 66 – 1 = 145 **Using doubles** **76 + 78** Double 70 + double 6 + 2 Double 70 + double 8 – 2 **Partitioning** Adding ones and tens to a 3 digit number **356 + 8** 356 + 4 + 4 = 364	**Using mental strategy where appropriate** **460 + 499** 460 + 500 – 1 = 959 **560 + 570** 1000 + 130 = 1130 **Partitioning** **5678 – 2342 =** 5678 – 2000 = 3678 3678 – 300 = 3378 3378 – 40 = 3338 3338 – 2 = 3336 **Difference** **5003 – 1106 = 3897** 5003-1003-103=3897	add and subtract numbers mentally with increasingly large numbers including decimals **1.5 + 1.5** Double 1 and double 0.5 **1.6 + 1.7** 1.7 + 0.3 + 1.3 = 3.3 **Partitioning** **45678 – 3500 = 42178** 45678 – 3000 = 42678 42678 – 500 = 42178 **5.78 – 2.45** =3.33 5.78 – 0.05 = 5.73 5.73 – 0.4 = 5.33 5.33 – 2 = 3.33	perform mental calculations, including with mixed operations and large numbers **Partitioning** **4.578 – 0.008 = 4.57** **6.378 – 0.07 = 6.308** **Difference using larger numbers and number facts** **£100 - £32.77 = £67.23** £100 – £32 = £68 £68 -77p = £67.23 **Difference (use mixed decimals)** 6.45 – 1.7 = 4.75 1.7 → 2 = 0.3 2 → 6.45 = 4.45

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			356 + 70 350 + 70 + 6 = 420 **356 + 600** 300 + 600 + 56 = 956			
	read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Written Methods)	show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot	**Using jottings:** **Partitioning** Subtracting ones and tens from a 3 digit number **567 – 60 = 507** **745 – 700 = 45** **832 – 2 = 830** **364 – 8** 364 **–** 4 **–** 4 = 356 **356 – 70** 356 – 50 – 20 = 286 **956 – 600** 956 – 600 = 356 **By counting back in tens and ones** **91 – 35** 91 – 30 – 1 – 4 **Special cases** 93 – 39 as 93 – 40 + 1 **Difference** **103 – 16 = 87** When numbers are close together, count on from the smallest number through the			use their knowledge of the order of operations to carry out calculations involving the four operations

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			multiple of ten or count back from the largest to the smallest through the multiple of ten.			
	NUMBER BONDS					
explore the composition of numbers to 10 automatically recall number bonds for numbers 0-5 and some to 10 (including subtraction and double facts)	represent and use number bonds and related subtraction facts within 20	recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100				

	WRITTEN METHODS					
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Children will make visual and practical displays with objects and pictures Hands on experiences of partitioning and combining	read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Mental Calculation)		add and subtract two digit by two digit numbers bridging tens. Add and subtract numbers with up to three digits, using written methods of columnar addition and subtraction. Do not use formal columnar method except with	add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and decomposition where appropriate	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and decomposition)	

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numbers in different contexts Link number symbol to its cardinal value			children who can demonstrate they are ready. (See models and images part of policy for guidance of process using manipulatives.) See SLT first.			
	INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS					
Automatically recall number bonds for numbers 0-5 including subtraction facts. Children will count to check answers (unless the answer has been subitised correctly without the need to count) Children will make predictions about the possible outcomes of word problems and number stories		recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	estimate the answer to a calculation and use inverse operations to check answers	estimate and use inverse operations to check answers to a calculation	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

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	PROBLEM SOLVING					
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
explore the composition of numbers to 10 practically Children will regularly be given opportunities to develop characteristics of effective learning through playing and exploring, having a go, making links, having their own ideas and developing these through everyday problem solving	solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = - 9	solve problems with addition and subtraction: * using concrete objects and pictorial representations, including those involving numbers, quantities and measures * applying their increasing knowledge of mental and written methods	solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
		solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change (copied from Measurement)				Solve problems involving addition, subtraction, multiplication and division

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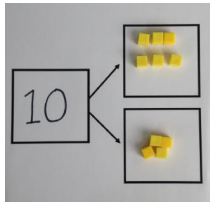
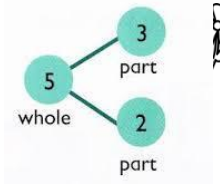
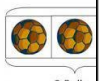
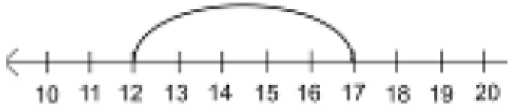
Addition and Subtraction

Addition

Objective and Strategies	Concrete	Pictorial	Abstract
Combining two parts to make a whole: part-whole model	  Use cubes to add two numbers together as a group or in a bar.  	   Use pictures to add two numbers together as a group or in a bar. 	4 + 3 = 7 10= 6 + 4  Use the part-part whole diagram as shown above to move into the abstract.
Starting at the bigger number and counting on		12 + 5 = 17 	5 + 12 = 17 Place the larger number in your head and count on the

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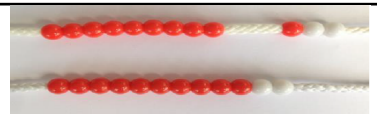
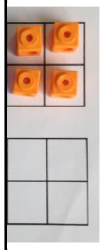
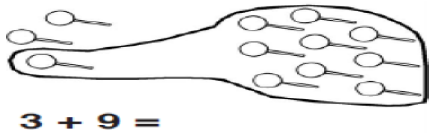
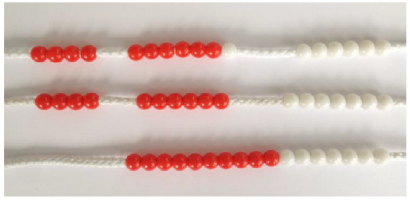
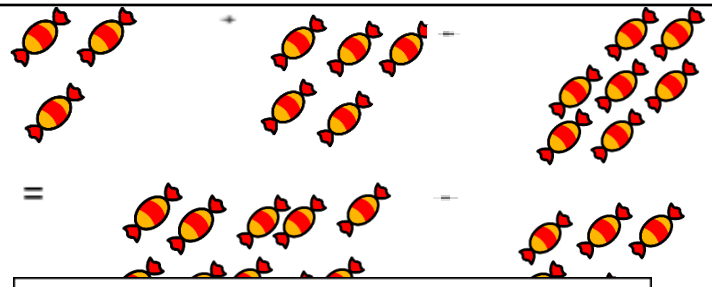
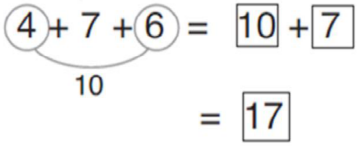
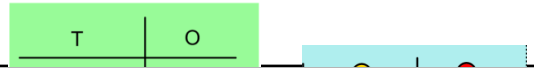
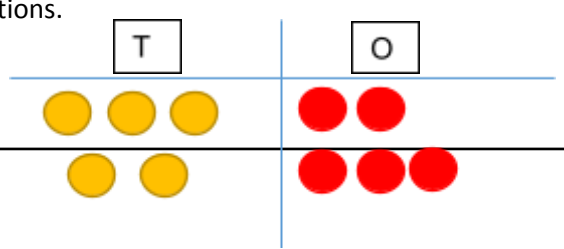
	Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.	Start at the larger number on the number line and count on in ones or in one jump to find the answer.	smaller number to find your answer.
Regrouping to make 10.	  6 + 5 = 11 Start with the bigger number and use the smaller number to make 10.	 3 + 9 = Use pictures or a number line. Regroup or partition the smaller number to make 10. 9 + 5 = 14 1 4 +1 +4 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	7 + 4= 11 If I am at seven, how many more do I need to make 10. How many more do I add on now?
Adding three single digits	4 + 7 + 6= 17 Put 4 and 6 together to make 10. Add on 7.  Following on from making 10, make 10 with 2 of the digits (if possible) then add on the third digit.	 = Add together three groups of objects. Draw a picture to recombine the groups to make 10.	 4 + 7 + 6 = 10 + 7 10 = 17 Combine the two numbers that make 10 and then add on the remainder.
Column method- no regrouping	24 + 15= Add together the ones first then add the tens. Use the Base 10 blocks first before moving onto place value counters.  T O	After practically using the base 10 blocks and place value counters, children can draw the counters to help them to solve additions.  T O	Calculations 21 + 42 = 21

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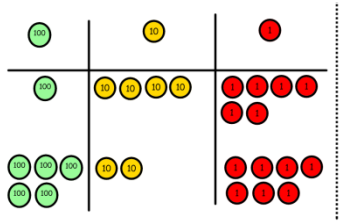
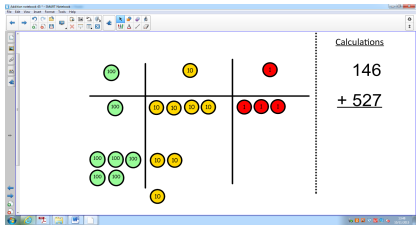
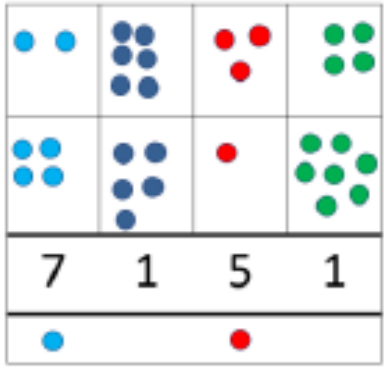
Column method- regrouping	Make both numbers on a place value grid.  146 + 527 Add up the units and exchange 10 ones for one 10.  Add up the rest of the columns, exchanging the 10 counters from one column for the next place value column until every column has been added. This can also be done with Base 10 to help children clearly see that 10 ones equal 1 ten and 10 tens equal 100. As children move on to decimals, money and decimal place value counters can be used to support learning.	Children can draw a pictoral representation of the columns and place value counters to further support their learning and understanding.  	Start by partitioning the numbers before moving on to clearly show the exchange below the addition. 20 + 5 40 + 8 60 + 13 = 73 536 + 85 621 1 1 As the children move on, introduce decimals with the same number of decimal places and different. Money can be used here. 72.8 + 54.6 127.4 1 1 2 3 . 5 9 7 . 5 5 3 1 . 1 4 1 1 1 2 3 . 3 6 1 9 . 0 8 0 5 9 . 7 7 0 + 1 . 3 0 0 9 3 . 5 1 1 2 1 2

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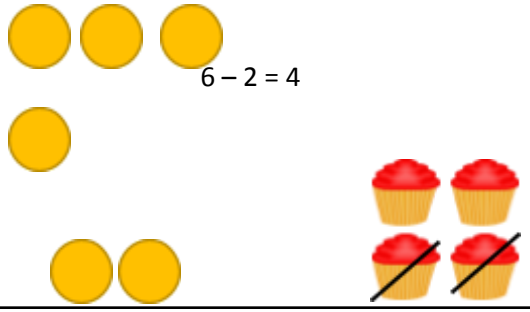
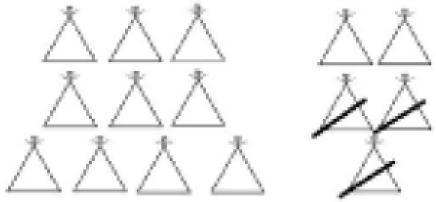
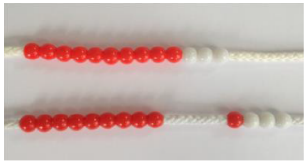
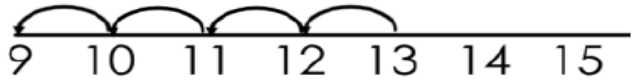
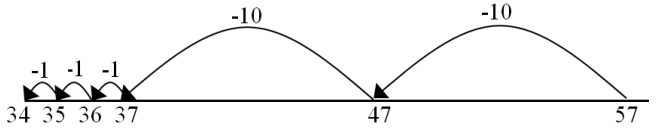
Addition and Subtraction

Subtraction

Objective and Strategies	Concrete	Pictorial	Abstract
Taking away ones	Use physical objects, counters, cubes etc to show how objects can be taken away.  6 – 2 = 4	Cross out drawn objects to show what has been taken away.  15 – 3 = 12	18 -3= 15 8 – 2 = 6
Counting back	Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones.  13 – 4 Use counters and move them away from the group as you take them away counting backwards as you go. 	Count back on a number line or number track  9 10 11 12 13 14 15 Start at the bigger number and count back the smaller number showing the jumps on the number line.  -1 -1 -1 -10 -10 34 35 36 37 47 57 This can progress all the way to counting back using two 2 digit numbers.	Put 13 in your head, count back 4. What number are you at? Use your fingers to help.

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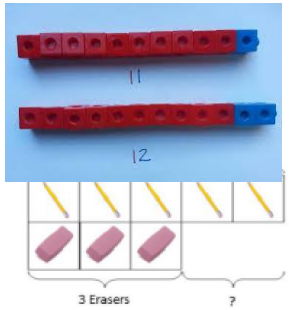
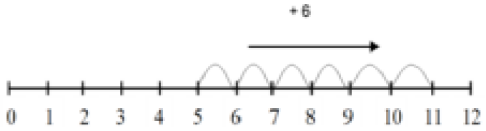
<table>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>Find the difference</td><td>Compare amounts and objects to find the difference.

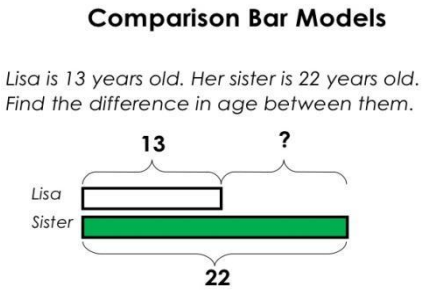
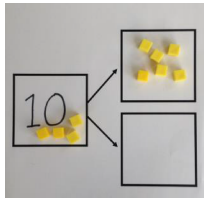
 

Use cubes to build towers or make bars to find the difference

Use basic bar models with items to find the difference</td><td> 

Count on to find the difference.

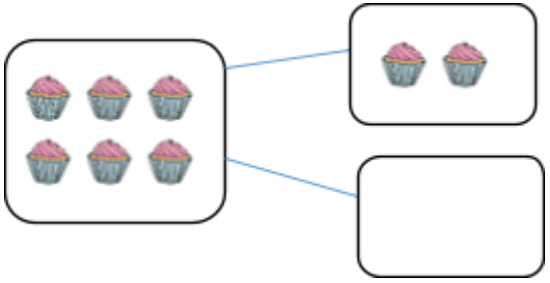
Draw bars to find the difference between 2 numbers.

 
</td><td>Hannah has 23 sandwiches, Helen has 15 sandwiches. Find the difference between the number of sandwiches.</td></tr>
<tr><td>Part Part Whole Model</td><td> 

Link to addition- use the part whole model to help explain the inverse between addition and subtraction.

If 10 is the whole and 6 is one of the parts. What is the other part?

10 - 6 =</td><td>Use a pictorial representation of objects to show the part part whole model.

  </td><td> 

Move to using numbers within the part whole model.</td></tr>
</table>

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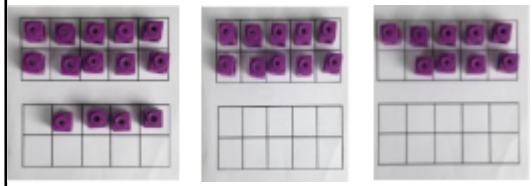
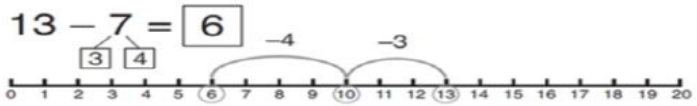
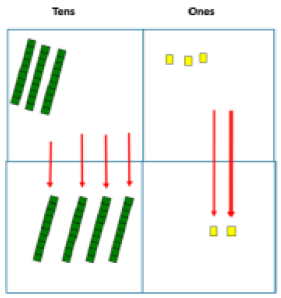
Addition and Subtraction

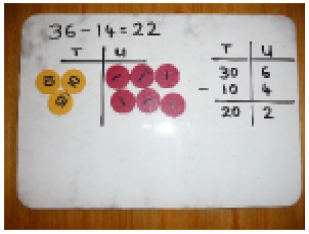
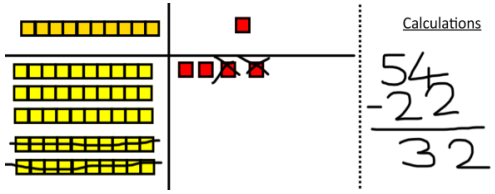
<table>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>Make 10</td><td>14 – 9 =
 
Make 14 on the ten frame. Take away the four first to make 10 and then takeaway one more so you have taken away 5. You are left with the answer of 9.</td><td> 

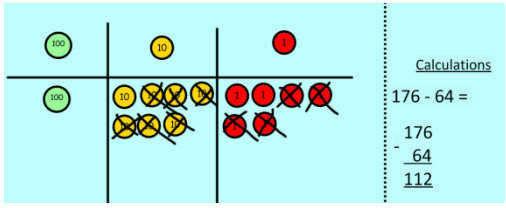
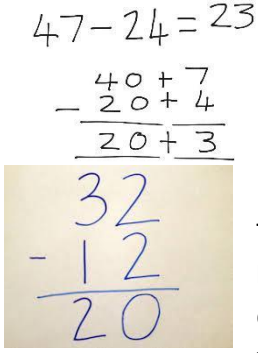
Start at 13. Take away 3 to reach 10. Then take away the remaining 4 so you have taken away 7 altogether. You have reached your answer.</td><td>16 – 8=

How many do we take off to reach the next 10?

How many do we have left to take off?</td></tr>
<tr><td>Column method without regrouping</td><td> 

Use Base 10 to make the bigger number then take the smaller number away.

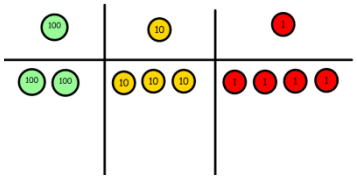
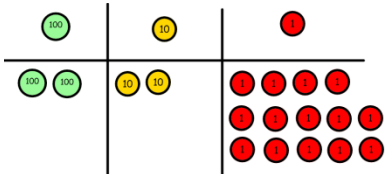
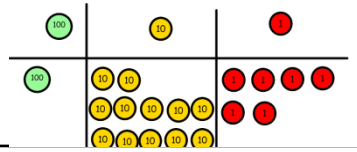
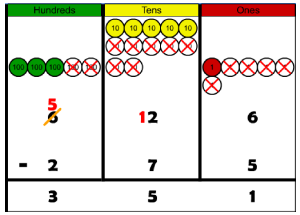
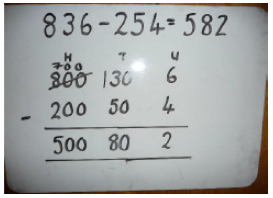
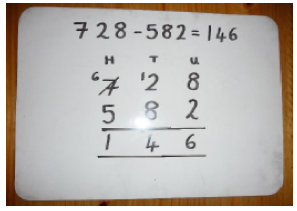
Show how you partition numbers to subtract. Again make the larger number first.
 
</td><td>Draw the Base 10 or place value counters alongside the written calculation to help to show working.
 

 
</td><td> 

This will lead to a clear written column subtraction.</td></tr>
</table>

Liscard Primary School Calculation Policy

Addition and Subtraction

Column method with regrouping	Use Base 10 to start with before moving on to place value counters. Start with one exchange before moving onto subtractions with 2 exchanges. Make the larger number with the place value counters  Calculations 234 - 88 Start with the ones, can I take away 8 from 4 easily? I need to exchange one of my tens for ten ones.  Calculations 234 - 88 Now I can subtract my ones. Now look at the tens, can I take away 8 tens easily? I need to exchange one hundred for ten tens.  Calculations 234 - 88	 Draw the counters onto a place value grid and show what you have taken away by crossing the counters out as well as clearly showing the exchanges you make. When confident, children can find their own way to record the exchange/regrouping. Just writing the numbers as shown here shows that the child understands the method and knows when to exchange/regroup.	 Children can start their formal written method by partitioning the number into clear place value columns.  Moving forward the children use a more compact method. This will lead to an understanding of subtracting any number including decimals. 5 12 1 2 6 3 . 0 - 2 6 . 5 2 3 6 . 5

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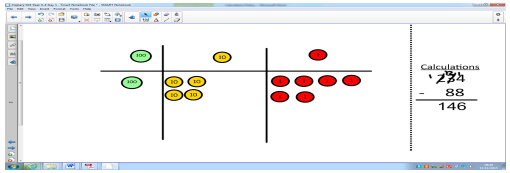
	Now I can take away eight tens and complete my subtraction  Show children how the concrete method links to the written method alongside your working. Cross out the numbers when exchanging and show where we write our new amount.		