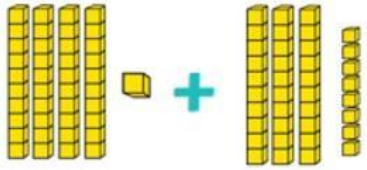
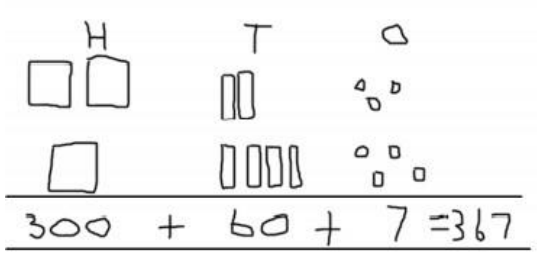
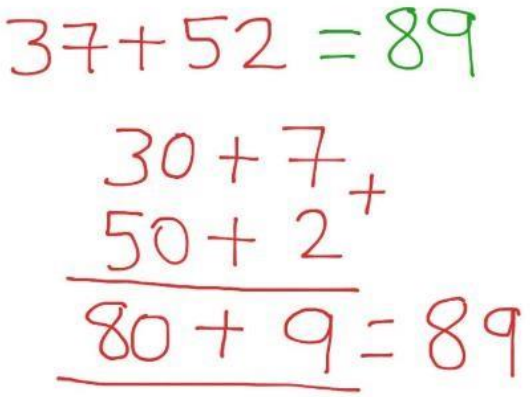
Year 3: Addition

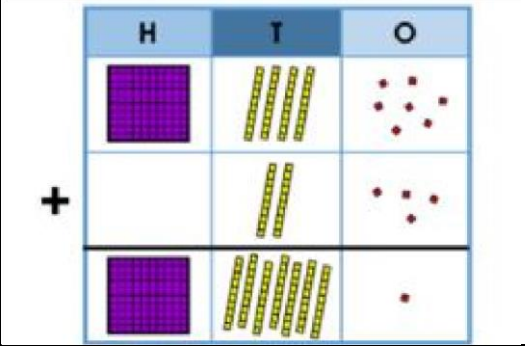
Vocabulary: add, make, altogether, sum, and, plus, total, more than, greater than, **combined**

Strategy	Concrete	Pictorial	Abstract
Expanded column addition <u>with</u> and <u>without</u> regrouping (**three digit + three digit).**	**Without regrouping:** Use dienes apparatus to physically make numbers, starting with the largest number (commutative law). Add ones, then add tens, then add hundreds working from right to left.  **41 + 38 =**	**Without regrouping: 223 + 144 =**  Partition the number into tens and ones by drawing tens and ones in columns. Work from the right to the left, adding the ones first and then adding the tens.	Expanded column addition:  Partition the number into tens and ones. Work from the right to the left, adding the ones first and then adding the tens. Recombine the tens and the ones to find the answer.

Column addition (compact) <u>with and without</u> regrouping (**three digit + three digit).**

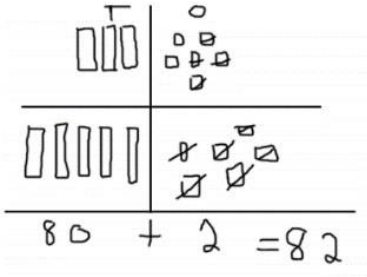
With regrouping:
Physically exchange ten ones for a ten and ten tens for a hundred when a ten or hundred boundary is met.

147 + 24 =



With regrouping:

37 + 46=



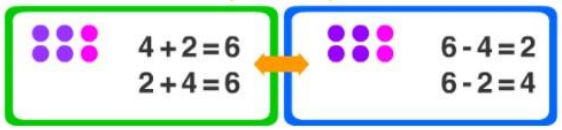
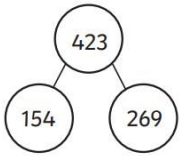
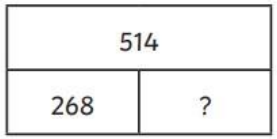
There are 12 ones so exchange ten ones for a ten. Cross out ten ones and add the extra ten into the tens column. Add as normal by adding the ones first and then adding the tens.

Column addition:

	1	4	7
+		2	4
	1	7	1
		1	

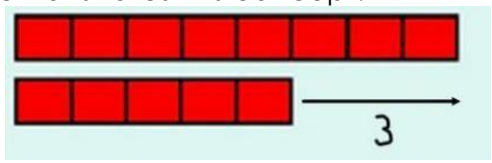
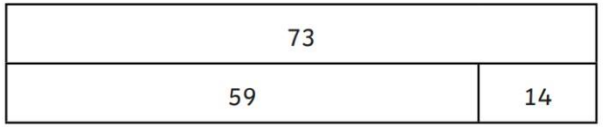
Work from the right to the left, beginning with the ones.

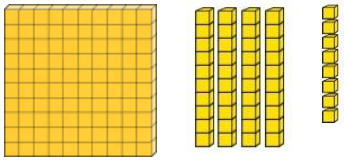
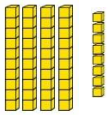
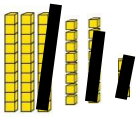
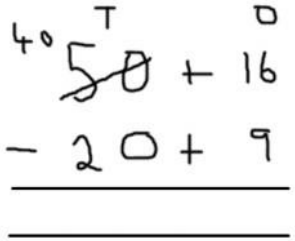
When exchanges take place, they should be recorded beneath the calculation.

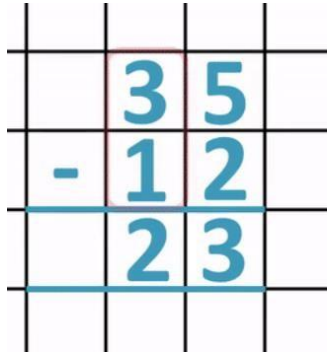
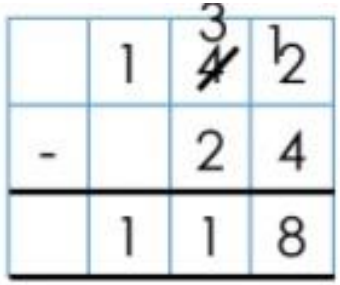
Using the inverse to check calculations.	Use practical apparatus such as counters, dienes apparatus, cubes etc. to form addition number sentences and then the related addition sentence using the commutative law and the related subtraction number sentences. **4 + 2 = 6**  Children need to understand the relationship between addition and subtraction as opposite operations.	Use pictorial models including bar models and part, whole models to show the inverse operation and the related number sentences. **154 + 269 = 423**  154 + 269 = 423 | 269 + 154 = 423 423 – 154 = 269 | 423 – 269 = 154 **268 + ? = 514**  **268 + ? = 514** **? + 268 = 514 514** **– 268 = ?** **514 - ? = 268**	Use formal methods for column addition and subtraction to demonstrate the inverse operation (including checking answers and calculating missing numbers). 

Year 3: Subtraction

Vocabulary: minus, take away, difference, less than, less, leave, left, left over, fewer, subtract, minus, difference between, distance between, subtraction

Strategy	Concrete	Pictorial	Abstract
Finding the difference.	Use practical apparatus to show the difference between two numbers. Equipment such as multilink, which is equal in size and can be lined up exactly, demonstrates this concept. 	Use bar models to show finding the difference between two numbers. What is the difference between 73 and 59? 	**Number Sentence:** What is the difference between 121 and 54? **121 – 54 =** **Number Stories:** Hannah has 108 sweets. Jack has 113 sweets. Find the difference between the number of sweets. **113 – 108 =**

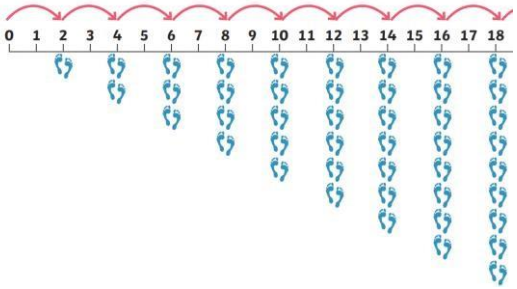
Expanded column subtraction <u>with and without</u> exchanging (**three digit - three digit/two digit).**	**Without exchanging: 148 – 17 =** Physically take away the ones, then the tens and then the hundreds.  **With exchanging: 32 – 7 =** Make the largest number using dienes apparatus. Physically take away the ones, then the tens and finally the hundreds. If there are not enough ones, exchange one ten for ten units. If there are not enough tens, exchange one hundred for ten tens.	**Without exchanging:** Draw the largest numbers. Cross out the ones being taken away, followed by the tens and then the hundreds. **With exchanging: 47 – 19 =** Draw the largest numbers.  If there are not enough ones, exchange one ten for ten units. If there are not enough tens, exchange one hundred for ten tens. Cross out the ones being taken away followed by the tens and the units. 	**Without exchanging:** TO - TO = Partition the numbers into tens and ones. Work from the right to the left, subtracting the ones first and then subtracting the tens. Recombine the ones and the tens o find the answer. 34 - 11 = 30 + 4 - 10 + 1 20 + 3 **With exchanging:** If there are not enough ones, exchange a ten for ten ones. 

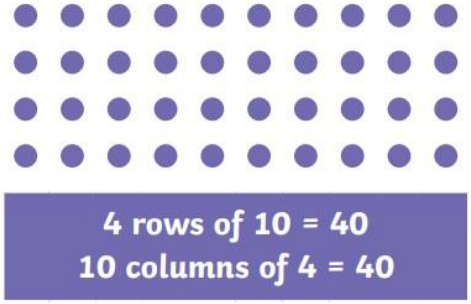
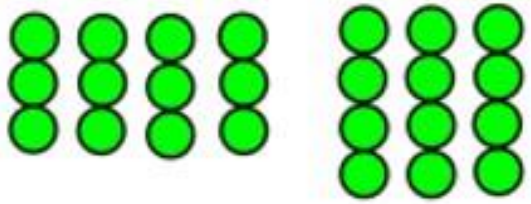
Compact column subtraction <u>with and without</u> exchanging (**three digit - three digit/two digit).**	**See expanded column subtraction for concrete methodology.**	**See expanded column subtraction for pictorial methodology.**	**Without exchanging:** Work from the right to the left, subtracting the ones first and then subtracting the tens. **35 – 12 =**  **With exchanging:** If there are not enough ones, exchange a ten for ten ones. If there are not enough tens, exchange a hundred for ten tens. **142 – 24 =** 

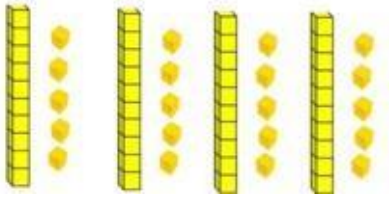
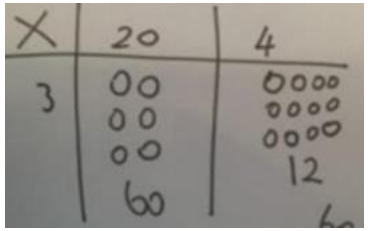
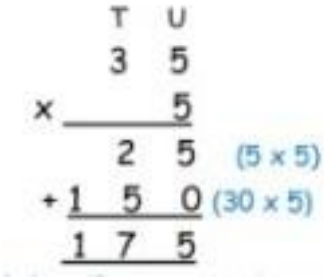
Year 3: Multiplication

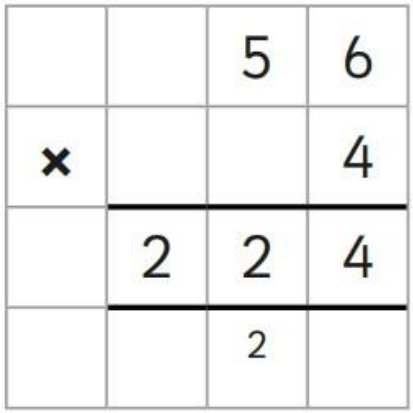
Vocabulary: double, groups, lot, grouping, array, twos, tens, fives, times, multiply, multiplied by, two times table, ten times table, five times table, multiple of, once, twice, three times, five times, ten times, time as, repeated addition, row, column, **sets, product**

Timetables Progression: 2s – 12s

Strategy	Concrete	Pictorial	Abstract
Counting in multiples.	Use practical apparatus/objects to count on in 2's. 	 Count on using a number line or number track.	**Number Sequence:** **2, 4, 6, 8, 10** **5, 10, ?, 20, ?**

Use of arrays to show commutativity.	Create arrays using counters/cubes to show multiplication.  4 rows of 10 = 40 10 columns of 4 = 40 **4 x 10 =**	Draw arrays to show multiplication.  Arrays should be created in different rotations to demonstrate the commutative law.	**Number Sentence:** **4 x 3 = 12** **3 x 4 = 12**

Expanded method of short multiplicati on (two digit by one digit)	Use dienes apparatus to make groups. Combine units and tens. Add together to find the total.  **4 x 15 =** **4 x 10 = 40** **4 x 5 = 20** **40 + 20 = 60** Use counters to represent value of digits to multiply in a place value grid. Recombine tens and ones.  **23 x 3 =** **20 x 3 = 60** **3 x 3 = 9** **60 + 9 = 69**	Draw dienes apparatus or counters to represent place value of digits in columns. **24 x 3 =** **60 + 12 = 72**  	**Expanded Method of Short Multiplication:**  Multiply from the right to the left (ones and then tens). When exchanges take place, they should be recorded beneath the calculation.

			 **Short Multiplication**

Year 3: Division

Vocabulary: half, halve, pair, share equally, equal groups, grouping, sharing, repeated subtraction, arrays, column, row, one each, two each, three each, group in pairs, group in tens, group in fives, equal groups of, divide, divided, divided by, divided into, **remainder, divide by 10**

Timetables Progression: 2s – 12s

Strategy	Concrete	Pictorial	Abstract

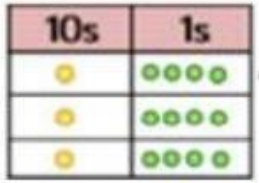
Short Division

Y3: Use short division to divide two digit numbers by one digit numbers.

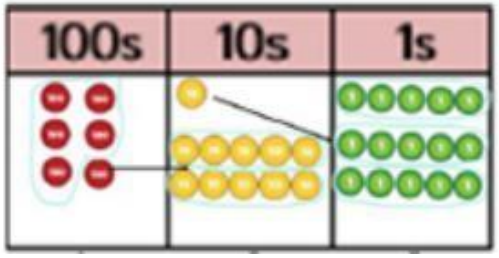
Y4: Use short division to divide three digit numbers by one digit numbers

Place value grids can also be used to support sharing larger quantities. One ten may need to be exchanged for ten ones.

42 ÷ 3 = 14



615 ÷ 5 = 123

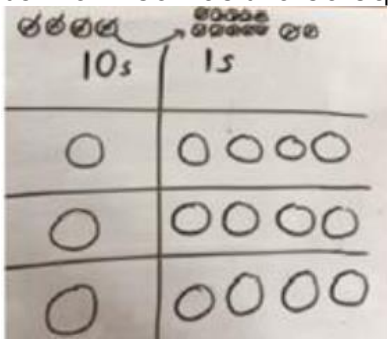


Make 615 with place value counters. How many groups of 5 hundreds can you make with 6 hundred counters?
Exchange 1 hundred for 10 tens.
How many groups of 5 tens can you make with 11 counters?
Exchange 1 ten for 10 ones.
How many groups of 5 ones can you make with 15 ones?

Place Value Grid:

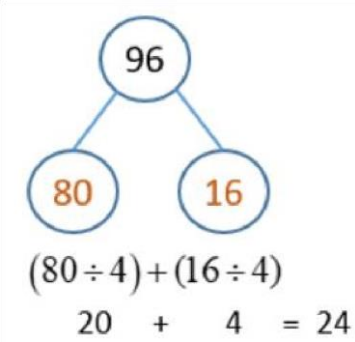
42 ÷ 3 = 14

Draw total amount (4 tens and 2 ones).
Divide into 3 equal groups.
Cross out counters as they are shared.
Where a ten cannot be shared equally, exchange for ten ones so that it can be shared equally.



Part-Whole Model:

96 ÷ 4 = 24



Number Sentence:

	2	1
4	8	4

Without carrying:

How many 4's in 8 (tens)?
How many 4's in 4 (ones)?

With carrying:

	1	5
3	4	$^{1}5$

How many 3's in 4(tens)?
Exchange the remaining ten.
How many 3's in 15?