Calculation Strategies Year R – Year 6

This document should be read in conjunction with the Caldecote Maths Curriculum

December 2021

<u>Contents</u>

IMPORTANT:

This document sets out the new calculation strategies taught in each year group.

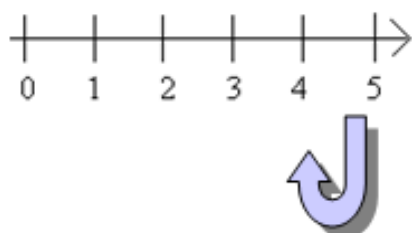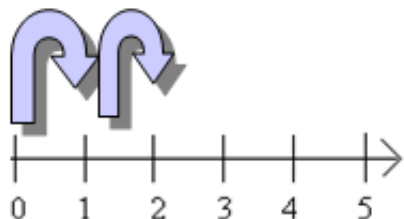**Children will <u>continue to use and consolidate methods taught in previous year groups</u>.**

Addition & Subtraction

EYFS: addition & subtraction

Number lines – count on and back

Adding and subtracting within 10 using fingers

Ten frames

7 + 3 =   or   10 – 3 =

5 -1 = 4
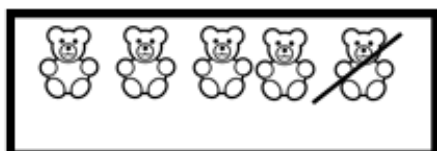
Part part whole

Pictorial representations
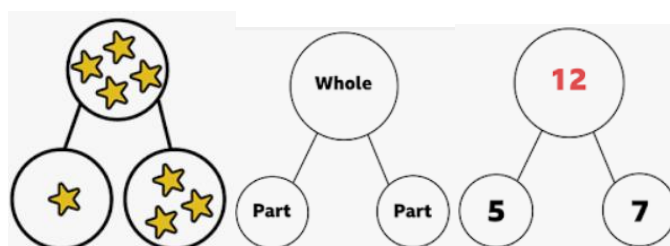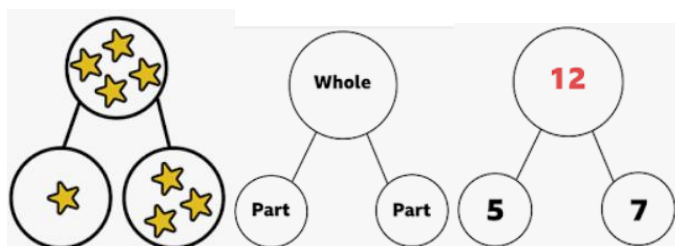
Manipulatives such as cubes and other objects

2   +   5

Year 1: addition & subtraction

Part part whole

5 + 7=12

12 - 5 =7

Children draw their own numberline for counting on and back

Ten frames

7 + 3 =   or   10 – 3 =

7 + 6 =
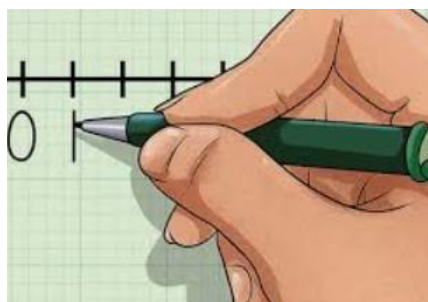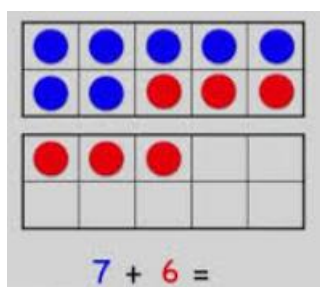
Addition and subtraction using tens and ones

11 + 4 =

Adding and subtraction using 100 square

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

3 – 2 = 1
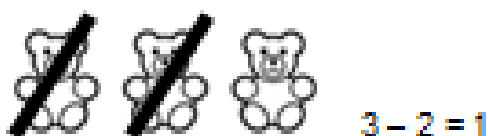
Subtraction by crossing out

Year 2: addition & subtraction

Column addition

457

+356

813

1   1

Step 1: Line the numbers up, using your knowledge of place value.

Step 2: Starting from the ones column, add the two digits. 7+6 is 13. The 3 stays in the ones column and the 1 (ten) goes into the tens column, at the bottom.

Step 3: Now the tens column, 5+5 = 10 then add the 1 from the bottom. This totals 11.

Step 4: The 1 stays in the tens column and the other 1 goes in the hundreds column.

Step 5: Add up the last column.
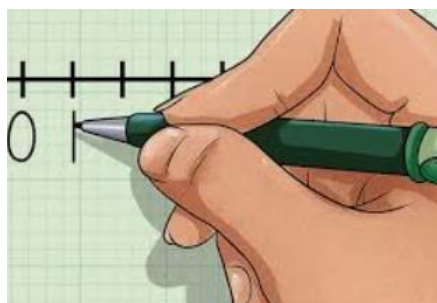
Adding using 100 square

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

5 + 10 = 15

15 − 10 = 5

Children draw their own numberline for

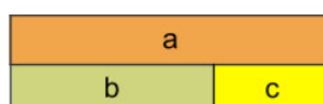counting on and back

Part part whole

37

30   7
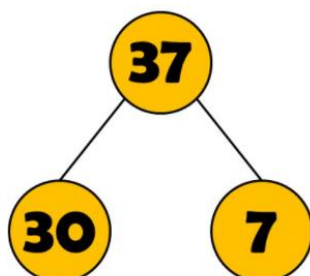
30 + 7 = 37

37 − 7 = 30

Bar model

a

b   c

This diagram encapsulates all of the following relationships;

$a = b + c$; $a = c + b$; $a - b = c$; $a - c = b$

Key Stage 2: addition and subtraction

Column subtraction

$$
\begin{array}{c}
{\scriptstyle 5\ \ \ \ 1\ 2\ \ \ \ 1}\\
\cancel{6}\ \cancel{3}6\\
-\ 2\ 4\ 7\\
\hline
3\ 8\ 9
\end{array}
$$

Step 1: Line the numbers up, using your knowledge of place value. Make sure the larger number is on the top.

Step 2: Starting from the ones column, subtract the 2 digits. Unfortunately, you cannot take 7 away from 6. You have to borrow from the tens column. Cross out the 3 and write a 2. You then write the borrowed 1 above the 6. This now makes 16. 16 – 7 = 9.

Step 3: Now the tens column: You can't do 2 – 4, so you have to borrow from the hundreds column. Cross out the 6 and put a 5. Now the tens columns becomes 12. 12-4 = 8

Step 4: Finally, take the 2 away from the 5, which equals 3.

Multiplication

EYFS: Multiplication

Grouping using objects and pictures

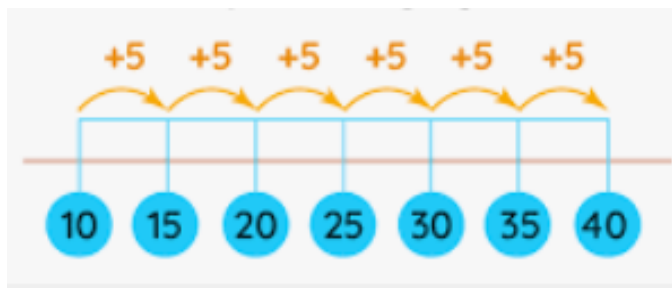## **Year 1: Multiplication**

How many legs do three teddies have?

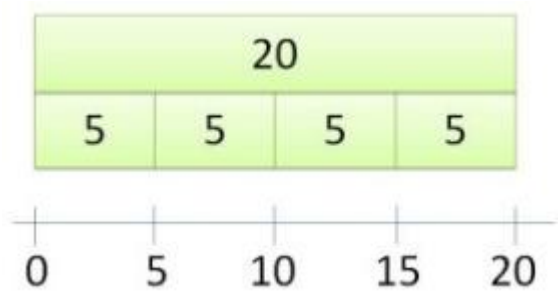
Multiplication by repeated addition

2 + 2 + 2 = 6

Arrays

2 x 4 array

Year 2: Multiplication

Counting in multiples

Bar Model representations

Year 3 & 4: Multiplication

Long Multiplication

5 6

457

x   19

4113

+4570

8683

THERE ARE TWO STAGES TO THIS CALCULATION, THE MULTIPLICATION AND THEN THE ADDING.

Step 1: Line the numbers up, using your knowledge of place value.

Step 2: Starting from the ones column, multiply 7 by 9. This equals 63. The 3 goes into the ones column and the 6 goes above the tens column.

Step 3: Now do 5 x 9, which equals 45. You now have to add the 6 onto that answer. This answer is now 51. The 1 stays in the tens column, whilst the 5 goes above the hundreds column.

Step 4: Then, do 4 x 9, which equals 36, and then add on the 5. This equals 41. You now have your first answer.

Step 5: Insert a place holder (0) in the tens column. You are now multiplying by 10.

Step 6: Using the same method as before, you multiply the 7 x 1, 5 x1 and then the 4 x1. Place these answers in the answer row.

Step 7: Finally, use your column addition to add together the two answers you have got. 4113 + 4570 = 8683

Year 5 & 6: Multiplication

Short Multiplication

5 6

457

x   9

4113

Step 1: Line the numbers up, using your knowledge of place value.

Step 2: Starting from the ones column, multiply 7 by 9. This equals 63. The 3 goes into the ones column and the 6 goes above the tens column.

Step 3: Now do 5 x 9, which equals 45. You now have to add the 6 onto that answer. This answer is now 51. The 1 stays in the tens column, whilst the 5 goes above the hundreds column.

Step 4: Finally, do 4 x 9, which equals 36, and then add on the 5. This equals 41. Place that in your answer row. You will now have your final answer.

Grid method

183 X 6 = 1098

x	100	80	3
6	600	480	18

600
480
18
1098

Then use column addition to add the answers together to get the final answer

6 x 100 = 600   6 x 80 = 480   6 x 3 = 18

Division

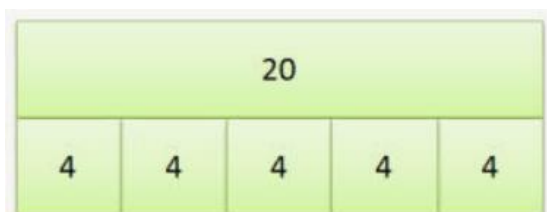# **EYFS and Year 1: Division**

Sharing into equal groups

Year 2: Division

Using multiplication knowledge and inverse for division

"I know that 6 multiplied by 3 is 18 so 18 divided by 6 is 3"

Bar model representations

20 divided by 4

Year 3 and Year 4: Division

Long division

$$374 \div 12 = \longrightarrow 12\overline{)374}$$

031 r 2

12$\overline{)374}$

-36

14

Step 1: How many 12's go into 3? You cannot do this so you write 0 above the bus stop.

Step 2: How many 12's go into 37? 3, so this goes next to the zero. Now you have to put the answer to 3 x 12 under the 37. You now subtract 36 from 37 to find the remainder. In this case it is 1.

Step 3: You now have to bring down the next number, 4. How many 12's go into 14? 1 with a remainder of 2. If the answer doesn't require a decimal remainder, you can stop here. You will have the answer 31 remainder 2.

Year 5 and Year 6: Division

$$232 \div 8 =$$
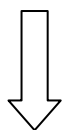
$$\begin{array}{r} 029 \\ 8\overline{)23^{7}2} \end{array}$$

Step 1: Set up your question as follows.

Step 2: To start with, see how many 8's go into 2. The answer is 0, so that is put above the 'bus shelter'.

Step 3: The 2 has to be used, so you move it along to the next digit. How many 8's go into 23? The answer is 2 (2 x8 = 16) with 7 remaining, which gets moved to the next column. The 2 gets put above the 'bus shelter' next to the 0.

Step 4: Now the question is, how many 8's go into 72 (the 7 remainders and the 2, which is already there)? The answer is 9, because 8 x 9 = 72.

Step 5: You now have your final answer, which is 29.