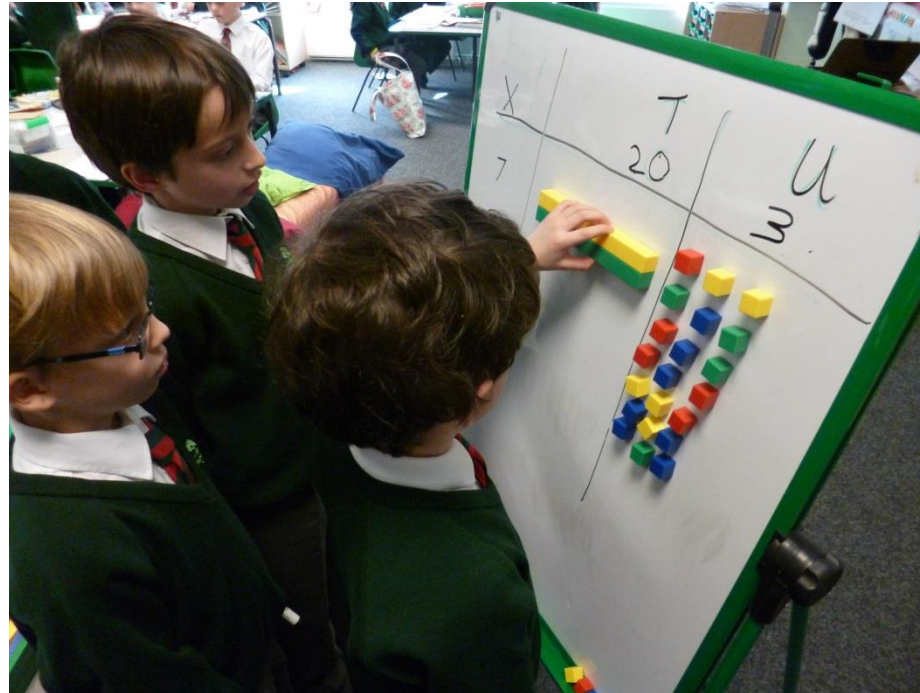




Bushy Hill  
Junior School

## Progression in Calculations





# Introduction

Written methods of calculations are based on mental strategies. Each of the four operations builds on mental skills which provide the foundation for jottings and informal written methods of recording. Skills need to be taught, practised and reviewed constantly. These skills lead on to more formal written methods of calculation.

Strategies for calculation need to be represented by models and images to support, develop and secure understanding. This, in turn, builds fluency. When teaching a new strategy it is important to start with numbers that the child can easily manipulate so that they can understand the methodology.

The transition between stages should not be hurried as not all children will be ready to move on to the next stage at the same time, therefore the progression in this document is outlined in stages. Previous stages may need to be revisited to consolidate understanding when introducing a new strategy.

A sound understanding of the number system is essential for children to carry out calculations efficiently and accurately.

# Magnitude of Calculations

**Year 1** –  $U + U$ ,  $U + TU$  (numbers up to 20) including adding zero,  $U - U$ ,  $TU - U$  (numbers up to 20) including subtracting zero,  $U \times U$ ,  $U \div U$

**Year 2** -  $TU + U$ ,  $TU +$  multiples of 10,  $TU + TU$ ,  $U + U + U$ ,  $TU - U$ ,  $TU -$  tens,  $TU - TU$ ,  $TU \times U$ ,  $U \div U$

**Year 3** – add numbers with up to three-digits,  $HTU +$  multiples of 10,  $HTU +$  multiples of 100, subtract numbers up to three-digits,  $HTU - U$ ,  $HTU -$  multiples of 10,  $HTU -$  multiples of 100,  $HTU - HTU$ ,  $TU \times U$ ,  $TU \div U$

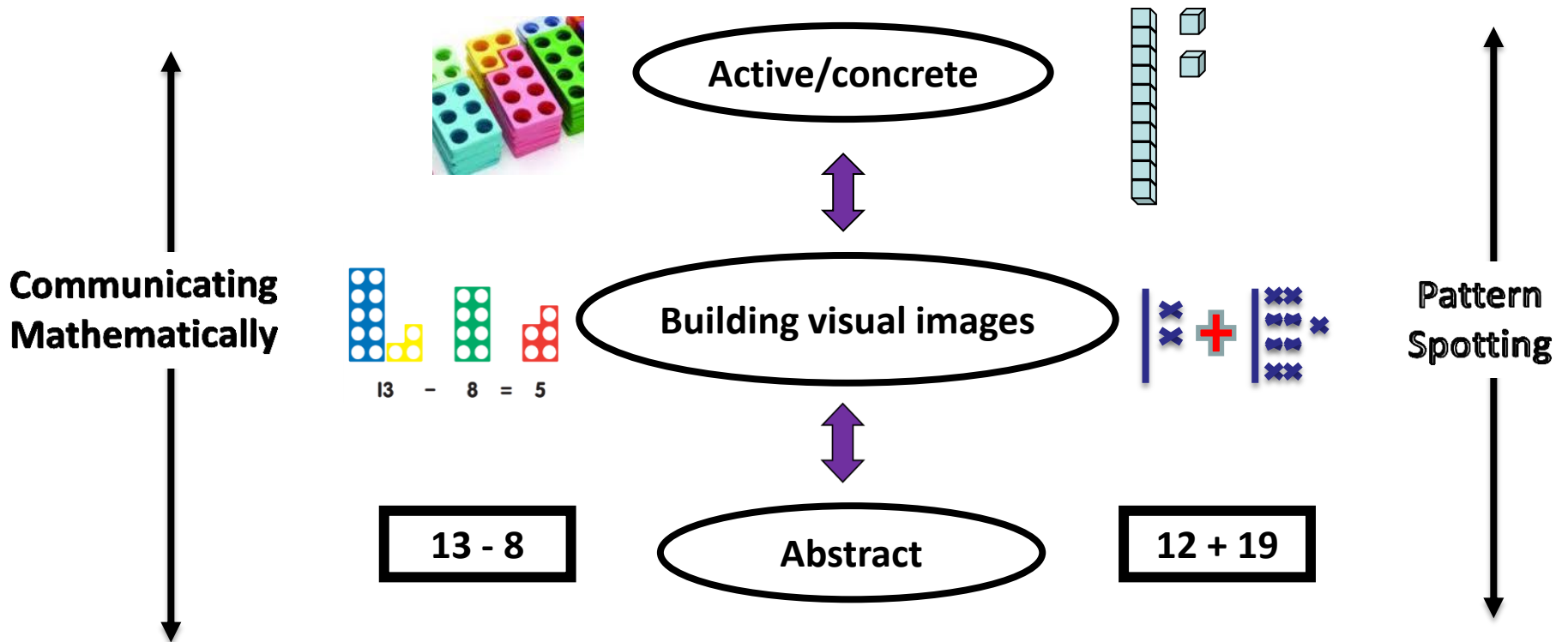
**Year 4** - add and subtract numbers with up to four-digits,  $ThHTU + ThHTU$ ,  $ThHTU - ThHTU$ , add and subtract decimals with up to two decimal places in the context of money, multiply three numbers together,  $TU \times U$ ,  $HTU \times U$ ,  $TU \times U$ , multiply by zero and one,  $TU \div U$ ,  $HTU \div U$

**Year 5** – add and subtract numbers with more than four-digits, add and subtract decimals with up to three decimal places,  $ThHTU \times U$ ,  $ThHTU \times TU$ ,  $HTU \times TU$ , multiply whole numbers and decimals with up to three-decimal places by 10, 100 and 1000, divide numbers with up to four-digits by  $U$  (including remainders as fractions and decimals and rounding according to the context)

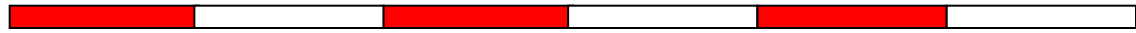
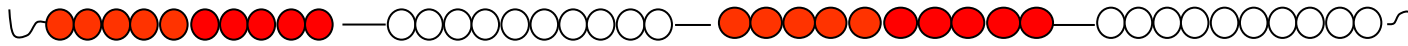
**Year 6** - add and subtract numbers with more than four-digits, add and subtract decimals with up to three decimal places, multiply numbers with up to four-digits by  $TU$ , multiply numbers with up to two-decimal places by a whole number, divide numbers up to four-digits by  $TU$  (interpreting remainder according to the context), divide decimals up to two-decimal places by  $U$  or  $TU$

# Structuring Learning

*Children must have concrete experiences that enable them to create visual images. They should be encouraged to articulate their learning and to become pattern spotters.*



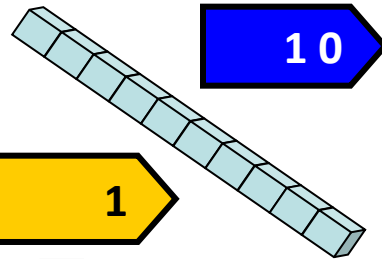
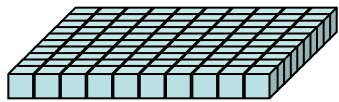
bead string



count stick

place value apparatus

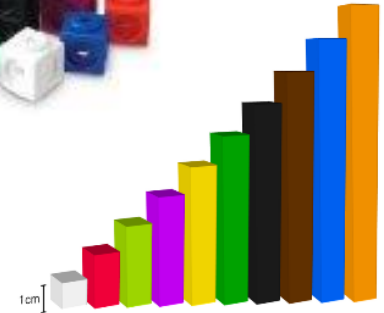
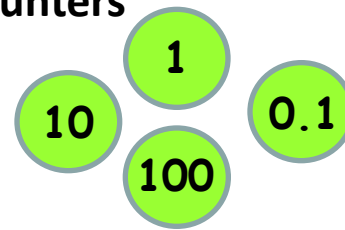
Hundreds 100s	Tens 10s	Units/Ones 1s



Multilink

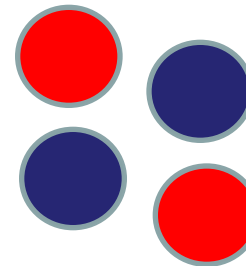
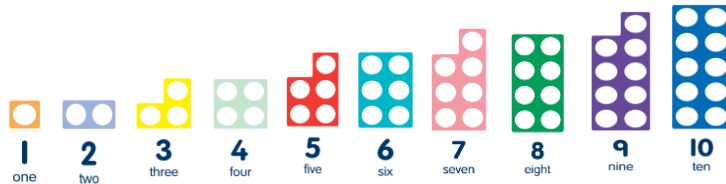


place value counters



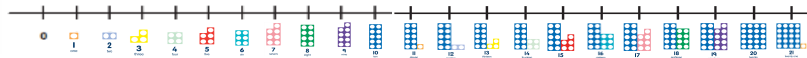
Cuisenaire

Numicon



double sided counters

number line



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
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200

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

number grids  
100 and 200