

Policy for

Calculation

Alameda Middle School



Inspire – Achieve – Excel

POLICY STATUS	
Policy Group	Curriculum
Related Policies:	
Reviewing Body:	Curriculum
Reviewed on:	TBC
Signed By: Chair of Governors	TBC
Date:	January 2017
Author:	K Whittingham / D Leonard

Introduction

The aim of this policy is to create a consistent approach to teaching calculation methods across the whole school and at home. The methods contained in this policy are what will be taught in maths lesson and are in line with the 2014 curriculum. Each section gives the appropriate standard from the national curriculum, demonstration of the method and examples of common mistakes.

Addition

National Curriculum

Pupils should be taught to add whole numbers with more than 4 digits, including using formal written methods (column addition.)

The Method

Question: 4531+ 6792

Step 1: Set out in place value columns. Neat presentation is important to avoid confusion between the columns. Squared paper will help with this.	Step 2: Add the units (U) column (1+2)	Step 3: Add the tens (T) column. (3+9) As this adds to a number larger than 9 we carry the ten. We put this below the sum in the next column.																																																																																																									
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Step 4: Add the hundreds (H) column. Remember to add the 1 carried from step 3. (5+7+1)	Step 5: Add the thousands (Th) column (4+6+1)	Answer																																																																																																									
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Common Mistakes

1) Children often forget to add the number carried over. (In this example the 1 at the bottom.)	2) Children can become confused by which number to carry. (in this example they have carried the units instead	3) Some children will always carry a 1 regardless of the total for that column. (in this example a 1 has been carried
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	of the tens)				instead of a 2.)				
Th	H	T	U	Th	H	T	U		
4	5	3	1	2	5	8	4		
+	6	7	9	2	+	6	1	4	8
1	0	2	2	3	8	1	1	1	
1	1				0	4	2		
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Subtraction

National Curriculum

Pupils should be taught to subtract whole numbers with more than 4 digits, including using formal written methods (column subtraction.)

The Method

Question: 4771 - 2138

Step 1: Set out in place value columns. Neat presentation is important to avoid confusion between the columns. Squared paper will help with this.	Step 2: Subtract the units (U) column (1-8) This does not work with the method as the answer is negative. Therefore we exchange a 10 into units. This leaves us with 6 tens and 11 units. (11-8)	Step 3: Subtract the tens (T) (6-3)																																																																																						
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Common Mistakes

1) Often children will say you can't do 1-6 so instead they will reverse the sum and do 6-1 when they should be exchanging .	2) In this example you need to 'double' exchange as there are zero tens. Children will often exchange straight from the hundreds to the units. This is incorrect you must exchange from the hundreds to the tens and then from the tens to the units.
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Th	H	T	U	Incorrect				Correct			
8	3	9	1	Th	H	T	U	Th	H	T	U
- 3	7	4	6	7	8 ⁷	0	¹ 1	7	8 ⁷	9 ¹⁰	¹ 1
5	4	5	5	- 4	3	0	5	- 4	3	0	5
				3	4	0	6	3	4	9	6

Multiplication

National Curriculum

Pupils should be taught to multiply numbers up to four digits by a one or two digit number using a formal written method, including long multiplication for two digit numbers.

Method for Short Multiplication

Question: 2332 x 4

Step 1: Set out in place value columns. Neat presentation is important to avoid confusion between the columns. Squared paper will help with this.	Step 2: Multiply the units (U) column (2x4)	Step 3: Multiply the tens (T) column (3x4) As the answer is a number larger than 9 we carry the ten. We put this below the sum in the next column.																																																																																										
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Method for Long Multiplication

Question: 3281 x 42

Step 1: Set out in place value columns. Neat presentation is important to avoid confusion between the columns. Squared paper will help with this.	Step 2: As in short multiplication multiply the units, tens, hundreds and thousands by the unit, in this example 2. (1x2, 8x2, 2x2, 3x2)	Step 3: Start a new row under the sum. Start by putting a 0 in the unit's column. This is because we are going to multiply by 40 which is 10 times bigger than 4.
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Common Mistakes

Division

- Divide numbers up to four digits by a single digit number using the formal method of short division and interpret remainders appropriately for the context (year 5)

- Divide numbers up to four digits by a two digit whole number using the formal written method of long division and interpret remainders as whole numbers, fractions or by rounding as appropriate for the context (year 6)

Method for Short Division

Question: $7323 \div 3$

Step 1: Set out sum (commonly referred to as 'bus shelter')	Step 2: Work out how many 3's are in 7 and write above. The remainder is carried over to the next number.	Step 3: Work out how many 3's are in 13. Write the answer above and carry the remainder onto the next number.
$\begin{array}{r} 3 \overline{) 7 \ 3 \ 2 \ 3} \end{array}$	$\begin{array}{r} 2 \\ 3 \overline{) 7 \ 13 \ 2 \ 3} \end{array}$	$\begin{array}{r} 2 \ 4 \\ 3 \overline{) 7 \ 13 \ 12 \ 3} \end{array}$
Step 4: Work out how many 3's are in 12 and write the answer above.	Step 5: Work out how many 3's are in 3 and write the answer above.	Answer
$\begin{array}{r} 2 \ 4 \ 4 \\ 3 \overline{) 7 \ 13 \ 12 \ 3} \end{array}$	$\begin{array}{r} 2 \ 4 \ 4 \ 1 \\ 3 \overline{) 7 \ 13 \ 12 \ 3} \end{array}$	2,441

Method for Long Division

Step 1: Set out sum (commonly referred to as 'bus shelter')	Step 2: Work out how many 14's are in 7 as there are 0 you work out how many 14's are in 73	Step 3: 5 lots of 14 are 70. We write this under the sum as shown below. We then subtract and bring down the
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		next number.
$\begin{array}{r} 14 \overline{) 7322} \end{array}$	$\begin{array}{r} 0 \quad 5 \\ 14 \overline{) 7322} \end{array}$	$\begin{array}{r} 0 \quad 5 \\ 14 \overline{) 7322} \\ 7 \quad 0 \quad \downarrow \\ \quad 3 \quad 2 \end{array}$
Step 4: Work out how many 14's are in 32. Write the answer above and then repeat step 3.	Step 5: Work out how many 14's are in 42 and write above.	Answer
$\begin{array}{r} 0 \quad 5 \quad 2 \\ 14 \overline{) 7322} \\ 7 \quad 0 \quad \downarrow \quad \downarrow \\ \quad 3 \quad 2 \\ \quad 2 \quad 8 \quad \downarrow \\ \quad \quad 4 \quad 2 \end{array}$	$\begin{array}{r} 0 \quad 5 \quad 2 \quad 3 \\ 14 \overline{) 7322} \\ 7 \quad 0 \quad \downarrow \quad \downarrow \\ \quad 3 \quad 2 \\ \quad 2 \quad 8 \quad \downarrow \\ \quad \quad 4 \quad 2 \\ \quad \quad 4 \quad 2 \\ \quad \quad \quad 0 \end{array}$	523

Common Mistakes

1) Children sometimes carry the remainder to the wrong place	2) Children sometime divide the numbers the wrong way round
$\begin{array}{r} 2 \quad 10 \quad 7 \quad 1 \\ 3 \overline{) 7323} \\ 7 \quad 3^1 \quad 2^1 \quad 3 \end{array}$	$\begin{array}{r} 2 \quad 4 \quad 7 \quad 7 \\ 14 \overline{) 7322} \end{array}$

Calculators

Under the current KS2 curriculum there is no calculator paper in the KS2 SATs and therefore no requirement in the curriculum for children to learn calculator skills in KS2. Children should use formal methods for calculating with larger numbers.

Children do not require a calculator for their maths lessons until after the KS2 SATs, when they start to use a scientific calculator. Pupils use a scientific calculator in KS3.

If you have any further queries please contact Mrs Piazza (KS2 maths subject leader) or Ms Leonard (KS3 maths subject leader).

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