Archbishop Cranmer C of E Primary Academy
Fluent in 5 – Mathematics

Intent

At Archbishop Cranmer we believe that regular practice of mental and written arithmetic skills is important in order to keep calculation skills fresh. Given that it has been widely reported that children and schools experience significant time pressures with the KS1 and KS2 arithmetic tests where many children are not able to complete the full test in the 30 minutes given, we have adopted daily Fluent in 5 practise to support our pupils confidence with mental approaches to calculations. This regular practice is intended to help our children distinguish between when to use a written method and when a mental method would be more efficient. In turn, this develops their ability to complete all the questions in an arithmetic test in the time given.

Implementation

In KS2, pupils complete the Fluent in 5 challenge each day for between 10 and 15 minutes. Pupils complete the challenge within 5 minutes before self-assessment is used to feedback answers and address misconceptions with the class teacher. The daily challenges are displayed in the format of the KS1 and KS2 arithmetic tests to prepare our pupils for the format they will experience during summer term assessments.

The daily challenges are designed within a clear progression structure, starting with questions that sit entirely within the EYFS framework for Year 1, and the Year 1 objectives for Year 2. The level then increases throughout Autumn and Spring Term to cover all of the objectives in the progression in objectives document for the current year group. By the end of Spring Term, all challenges will sit within the objectives of the current year group. For both Years 3 and 4 and Years 5 and 6, the daily challenges are designed within a clear progression structure, starting the year with questions which all sit within the previous year group's objectives, and progressing throughout Autumn Term to cover all of the objectives in the Progression in Objectives document for the current year group. The resource is structured so that certain 'tricky' objectives appear in each challenge during a given week, so that these skills can be developed. Each challenge also contains a mix of other questions, so that a full breadth of the objective document is covered.
By Spring Term, all challenges will sit within the objectives of the current year group.

To ensure our Key Stage 2 pupils identify mental questions, In **Years 3 and 4**, symbols are used initially to help train children to identify questions which require a written method and those which are designed for a mental approach. Throughout the year, these symbols will gradually be reduced so that children are making their own choices about whether a question should be approached mentally or using a written method. By the summer term, there will be no symbols with the questions. In **Years 5 and 6**, it is suggested that children spend the first 30 seconds of their Fluent in Five challenge time identifying the mental questions, and marking these with an 'M' or other symbol.

Structure of Fluent in 5

The below progression grids shows the objectives covered within the Fluent in 5 materials.

Year 1 3 questions each day - the PowerPoint resources include pictorial representations or suggestions of concrete apparatus which can be used to solve the problem.	**Year 2** Weeks 1-15 — 3 questions per day Week 15 onwards — 4 questions per day	**Year 3** Weeks 1-6 — 4 questions – 3 mental, 1 written Weeks 7-25 — 4 questions – 2 mental, 2 written Weeks 25 onwards — 5 questions – 3 mental, 2 written
Year 4 Weeks 1-9 — 4 questions – 2 mental, 2 written Weeks 9 onwards — 5 questions – 3 mental, 2 written	**Year 5** Weeks 1 and 2 — 4 questions – 2 mental, 2 written Week 3 onwards — 5 questions – 3 mental, 2 written	**Year 6** Weeks 1-8 — 5 questions – 3 mental, 2 written Weeks 9-2 — 6 questions – 3 to 4 mental, 2 to 3 written Week 20 onwards — 7 questions – 4 mental, 3 written

Impact

Pupils are familiar with the format of the arithmetic test at the end of Key Stage 1 and Key Stage 2 and are able to confidently answer the questions within the 30 minute time frame. Pupils are able to distinguish between when to use written methods and when mental methods are more efficient to be able to score well due to their high levels of fluency and application of skills and apply in context.

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Fluent in 5 Progression

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Number and Place Value	Count reliably with numbers from 1 to 20. (N1)	Count in ones to and across 100, forward and backwards, beginning with 0 or 1 or from any given number. (N1) Count in multiples of twos, fives and tens. (N1)	Count in steps of 2, 3 and 5, from 0, and in tens from any number, forward or backward. (N1)	Count from 0 in multiples of 4, 8, 50 and 100. (N1)	Count in multiples of 2 , 4, 6, 7, 8, 9, 25, 50 and 1,000. (N1)	Count in multiples of 2, 4, 6, 7, 8, 9, 25 and all powers of 10 for any given number up to 1,000,000. (N1)	Count in multiples of 2, 4, 6, 7, 8, 9, 25 and all powers of 10 for any given number up to 1,000,000. (N1)
		Count, read and write numbers up to 100 in numerals. Read and write numbers from 1 to 20 in words. (N2)	Read and write numbers to at least 100 in numerals and in words. (N2)	Read and write numbers to 1,000 in numerals and in words. (N2)	Read, write, order and compare numbers beyond 1,000. (N2)	Read, write, order and compare numbers to at least 1,000,000. (N2)	Read, write, order and compare numbers to at least 10,000,000 (N2)
	Place number 1 to 20 in order. (N3)		Compare and order numbers from 0 up to 100; using <, > and = signs. (N3)	Compare and order numbers from 0 up to 999, use <, > and = signs. (N3)			
	Say what is one more and one less than a given number (to 20). (N4)	Identify one more and one less. (N4)		Find 10 or 100 more or less than a given number. (N4)	Find 10, 100 or 1,000 more or less than a given number (N4)	Find 10, 100 or 1,000 more of less than a given number. (N4)	Find 10, 100 or 1,000 more of less than a given number. (N4)
			Recognise the place value of each digit in a two-digit number (tens and ones). (N5)	Recognise the place value of each digit in a three-digit number (hundreds, tens and ones). (N5)	Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens and ones). (N5)	Recognise the place value of each digit in numbers up to 1,000,000. (N5)	Recognise the place value of each digit in numbers up to 1,000,000. (N5)
					Count backwards through zero to include negative numbers (N6).	Interpret negative numbers in con- text, count forwards and backwards with positive and negative whole numbers, including through zero. (N6)	Use negative numbers in context, and calculate intervals across zero (N6)

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
The Four Operations	Represent and use number bonds to 10. (C KS1 1)	Represent and use number bonds within 20. (C KS1 1)	Recall and use addition facts to 20 fluently and derive and use related facts up to 100. (C KS1 1)				
	Represent and use related subtraction facts for number bonds to 10. (C KS1 2)	Represent and use number bonds and related subtraction facts within 20. (C KS1 2)	Recall and use subtraction facts to 20 fluently and derive and use related facts up to 100. (C KS1 2)				
	Add and subtract two single digit numbers, counting forward or back to find the answer. (C1)	Add and subtract one-digit and two-digit numbers to 20, including zero (C1)	b) Add and subtract a two-digit number and ones. c) Add and subtract a two-digit number and tens. d) Add and subtract two two-digit numbers (no crossing of tens boundary). e) Add three one-digit numbers. (C1)	a) Add and subtract numbers with up to three digits and ones. b) Add and subtract numbers with up to a three digits and tens. c) Add and subtract numbers with up to a three digits and hundreds. d) Add and subtract two two-digit numbers (no crossing of tens boundary). e) Add three one-digit numbers. (C1)	a) Add and subtract numbers with up to three digits and ones. b) Add and subtract numbers with up to a three digits and tens. c) Add and subtract numbers with up to a three digits and hundreds. d) Add and subtract two two-digit numbers (crossing of tens boundary). e) Add three one-digit numbers. (C1)	a) Add and subtract numbers with up to three digits and ones. b) Add and subtract numbers with up to three digits and tens. c) Add and subtract numbers with up to three digits and hundreds. d) Add and subtract two two-digit numbers (no crossing of tens boundary). e) Add three one-digit numbers. f) Add and subtract multiples of 10 and 100 mentally. g) Add and subtract near multiples of 10, 100 and 1,000 mentally. h) Add and subtract numbers which include tenths mentally. (C1)	a) Add and subtract numbers with up to three digits and ones. b) Add and subtract numbers with up to three digits and tens. c) Add and subtract numbers with up to three digits and hundreds. d) Add and subtract two two-digit numbers (crossing of tens boundary). e) Add three one-digit numbers. f) Add and subtract multiples of 10 and 100 mentally. g) Add and subtract near multiples of 10, 100 and 1,000 mentally. h) Add and subtract decimal numbers with up to three places mentally. i) Solve mental calculations which involve multiple operations. (C1)
		a) Read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs. b) Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ?– 9 (C2)	Add and subtract numbers using concrete objects and pictorial representations, including: • a two-digit number and ones • a two-digit number and tens • two two-digit numbers • adding three one-digit numbers (C2)	Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction. (C2)	Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction. (C2)	Add and subtract numbers with more than 4 digits using the formal written methods of columnar addition and subtraction where appropriate. (C2)	a) Add and subtract numbers with more than 4 digits using the formal written methods of columnar addition and subtraction where appropriate. b) Add and subtract decimal numbers using the formal written methods of columnar addition and subtraction where appropriate. (C2)

	Solve problems involving doubling, halving and sharing. (C3)		a) Recall and use multiplication and division facts for the 2 times multiplication table, including recognising odd and even numbers. b) Recall and use multiplication and division facts for the 5 times multiplication table. c) Recall and use multiplication and division facts for 10 times multiplication table. (C3)	a) Recall and use multiplication and division facts for the 4 times table. b) Recall and use multiplication and division facts for the 8 times multiplication table. c) Recall and use multiplication and division facts for the 3 times multiplication table. d) Recall and use multiplication and division facts for the 2, 5 and 10 times multiplication table. (C3)	a) Recall and use multiplication and division facts for the 7 times table. b) Recall and use multiplication and division facts for the 9 times multiplication table. c) Recall and use multiplication and division facts for all times tables up to 12x12 multiplication table. d) Recall and use multiplication and division facts for the 2, 3, 4, 5, 8 and 10 times multiplication table. (C3)	a) Recall and use multiplication and division facts for all times tables up to 12 x 12. (C3)	Recall and use multiplication and division facts for all times tables up to 12 x 12. (C3)
				a) Use place value, known and de- rived facts to multiply by 0. b) Use place value, known and derived facts to multiply and divide by 1. (C4)	a) Use place value, known and de- rived facts to multiply by 0. b) Use place value, known and derived facts to multiply and divide by 1. c) Use place value, known and de- rived facts to multiply 3 single-digit numbers. d) Use place value, known and de- rived facts to multiply multiples of 10 by a single-digit number. e) Find the effect of dividing a one or two-digit number by 10 and 100. (C4)	a) Use place value, known and de- rived facts to multiply by 0. b) Use place value, known and de- rived facts to multiply and divide by 1. c) Use place value, known and derived facts to multiply 3 single digit numbers. d) Use place value, known and de- rived facts to multiply multiples of 10 by a single digit number. e) Multiply and divide whole numbers, including those involving decimals, by 10, 100 and 1,000. f) Use place value, known and de- rived facts to multiply and divide multiples of 10 and 100 by single digit numbers. g) Use place value, known and derived facts to multiply and divide multiples of 10 and 100 together. h) Use place value, known and derived facts to multiply and divide by 25. (C4)	a) Use place value, known and de- rived facts to multiply by 0. b)Use place value, known and derived facts to multiply and divide by 1. c) Use place value, known and derived facts to multiply 3 single digit numbers. d) Use place value, known and de- rived facts to multiply multiples of 10 by a single digit number. e) Multiply and divide whole numbers, including those involving decimals, by 10, 100 and 1,000. f) Use place value, known and de- rived facts to multiply and divide multiples of 10 and 100 by single digit numbers, and to multiply by 25. g) Use place value, known and de- rived facts to multiply and divide multiples of 10 and 100 together. h) Multiply decimals with up to 2 decimal places by a single digit number. (NB: some children may find using an informal written method helps with this type of calculation). (C4)

		Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. (C8)	b) Calculate mathematical statements for multiplication within the known the multiplication tables and write them using the multiplication (×), and equals (=) signs. b) Calculate mathematical statements for division within the known multiplication tables and write them using the division (÷) and equals (=) signs. (C8)	b) Calculate mathematical statements for multiplication within the known the multiplication tables and write them using the multiplication (×), and equals (=) signs. b) Calculate mathematical statements for division within the known multiplication tables and write them using the division (÷) and equals (=) signs. (C8)	a) Write and calculate mathematical statements for multiplication using the multiplication tables that pupils know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. b) Write and calculate mathematical statements for division using the multiplication tables that pupils know, including for two-digit numbers divided by one-digit numbers, using mental and progressing to formal written methods. c) Solve problems, including missing number problems, involving multiplication and division. (C8)	a) Multiply two-digit and three-digit numbers by a one-digit number using formal written layout. b)Multiply numbers up to four-digits by a two-digit number, including long multiplication for two digit numbers. c) Divide numbers up to four digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the contex. [NB: In calculation paper, remainders as either a remainder (e.g. 5 r 3), fraction (e.g. 5 r 35) or decimal (e.g. 5.6) will always be acceptable.] d) Solve problems, including missing number problems, involving multiplication and division. (C8)	a) Multiply two-digit and three-digit numbers by a one-digit number using formal written layout. b) Multiply numbers up to 4 digits by a two-digit number, including long multiplication for two digit numbers. c) Divide numbers with up to 4 digits by a one-digit number using the for- mal written method of short division and interpret remainders appropriately for the context. [NB: In calculation paper, remainders as either a remainder (e.g 5 r 3), fraction (e.g. 5 r 35) or decimal (e.g. 5.6) will always be acceptable] d) Solve problems, including missing number problems, involving multiplication and division. (C8)
						a) Solve problems involving square numbers. b) Solve problems involving cubed numbers. (C9)	a) Solve problems involving square numbers. b) Solve problems involving cubed numbers. (C9)
							Use their knowledge of the order of operations to carry out calculations involving the four operations. (C10)

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Fractions	Recognise, find and name a half and one quarter as one of two equal parts of an object, shape or quantity. (F1)	Recognise, find and name a half and one quarter as one of two equal parts of an object, shape or quantity. (F1)	Recognise, find, name and write fractions 1⁄2, 1⁄4, 2/4 and 3⁄4 of a length, shape, set of objects or quantity. (F1)	Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators (minimum de-nominators of 2, 3, 4, 5, 6, 7, 8, 9, 10). (F1)	Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators (minimum de-nominators of 2, 3, 4, 5, 6, 7, 8, 9, 10). (F1)	Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators (any denominators - linked to times tables facts). (F1)	Recognise, find and write fractions of a discrete set of objects and numbers: unit fractions and non-unit fractions (any denominators - linked to times tables facts). (F1)
					Count up and down in tenths; recognize that tenths arise from dividing an object into 10 equal parts and in dividing one- digit numbers or quantities by 10. (F2)	Count up and down in tenths and hundredths ;recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten. (F2)	Count up and down in tenths and hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten. (F2)
			Write simple fractions [e.g. 12 of 6 = 3] (F3)	Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators. (F3)	Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators. (F3)	Recognise and use fractions as numbers: unit fractions and non-unit fractions with any denominators. (F3)	Recognise and use fractions as numbers: unit fractions and non-unit fractions with any denominators. (F3)
			Recognise the equivalence of 2/4 and 1/2 (F4)	Recognise and show, using diagrams, equivalent fractions with small de-nominators. (F4)	Recognise and show, using diagrams, families of common equivalent fractions. (F4)		
				Add and subtract fractions with the same denominator within one whole [e.g. 5/7 + 1/7 = 6/7]. (F5)	Add and subtract fractions with the same denominator within one whole (including improper fractions). (F5)	a) Add and subtract fractions with the same denominator. b) Add and subtract fractions with denominators that are multiples of the same number. c) Multiply proper fractions and mixed numbers by whole numbers. (F5)	a) Add and subtract fractions with different denominators and mixed numbers using the concept of equivalent fractions. b) Multiply proper fractions and mixed numbers by whole numbers. c) Multiply simple pairs of proper fractions, writing the answer in its simplest form. d) Divide proper fractions by whole numbers. (F5)
Percentages							Solve problems involving the calculation of percentages [e.g. of measures such as 15% of 360]. (P1)