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**Addition and Subtraction**

**St Paul’s CE Primary School – Calculation Policy**

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| **Year One** | |
| **National Curriculum**  Pupils should be taught to:   * read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs * represent and use number bonds and related subtraction facts within 20 * add and subtract one-digit and two-digit numbers to 20, including 0 * solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? – 9 | |
| **Golden Threads:**   * Develop fluency in addition and subtraction facts within 10. * Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers. * Read, write and interpret equations containing addition (+), subtraction (-) and equals (=) symbols, and relate additive expressions and equations to real-life contexts. | |
| **Add 1-digit numbers within 10**  When adding numbers to 10, children can explore both **aggregation** and **augmentation**.  The part-whole model, discrete and continuous bar model, number shapes and ten frame support aggregation.  The combination bar model, ten frame, bead string and number track all support augmentation. |  |
| **Add 1 and 2-digit numbers to 20**  When adding one-digit numbers that cross 10, it is important to highlight the importance of ten ones, equalling one ten.  Different manipulatives can be used to represent this exchange. Use concrete resources alongside number lines to support children in understanding how to partition their jumps. |  |
| **Subtract 1-digit numbers within 10**  Part-whole models, bar models, ten frames and number shapes support partitioning.  Ten frames, number tracks, single bar models and bead strings support reduction.  Cubes and bar models with two bars can support finding the difference. |  |
| **Subtract 1 and 2-digit numbers to 20**  When subtracting one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten.  Children should be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten frames, number shapes and number lines are particularly useful for this. |  |

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**Addition– Year One**

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| **Concrete** | **Pictorial** | **Abstract** |
| **Add 1-digit numbers within 10** | | |
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| **Add 1 and 2-digit numbers to 20** | | |
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**Subtraction – Year One**

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| **Concrete** | **Pictorial** | **Abstract** |
| **Subtract 1-digit numbers within 10** | | |
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| **Subtract 1 and 2-digit numbers to 20** | | |
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**Addition and Subtraction**

**St Paul’s CE Primary School – Calculation Policy**

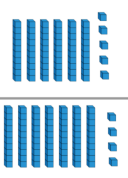
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| **Year Two** | |
| **National Curriculum**  Pupils should be taught to:   * solve problems with addition and subtraction: * using concrete objects and pictorial representations, including those involving numbers, quantities and measures * applying their increasing knowledge of mental and written methods * recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 * add and subtract numbers using concrete objects, pictorial representations, and mentally, including:   a two-digit number and 1s  a two-digit number and 10s  2 two-digit numbers   * adding 3 one-digit numbers * show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot * recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems | |
| Golden Threads:   * Secure fluency in addition and subtraction facts within 10, through continued practice. * Add and subtract across 10. * Recognise the subtraction structure of ‘difference’ and answer questions of the form, How many more…?’ * Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract only ones or only tens to/ from a two-digit number. * Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract any 2 two-digit numbers. | |
| **Add 1 and 2-digit numbers to 20**  When adding one-digit numbers that cross 10, it is important to highlight the importance of ten ones, equalling one ten.  Different manipulatives can be used to represent this exchange. Use concrete resources alongside number lines to support children in understanding how to partition their jumps. |  |
| **Add three 1-digit numbers**  When adding three 1-digit numbers, children should be encouraged to look for number bonds to 10 or doubles to add the numbers more efficiently.  This supports children in their understanding of commutativity.  Manipulatives that highlight number bonds to 10 are effective when adding three 1-digit numbers. |  |
| **Add 1-digit and 2-dgit numbers to 100**  When adding single digits to a two-digit number, children should be encouraged to count on from the larger number.  They should also apply their knowledge of number bonds to add more efficiently e.g. 8 + 5 = 13 so 38 + 5 = 43.  Hundred squares and straws can support children to find the number bond to 10. |  |
| **Add two 2-digit numbers to 100.**  At this stage, encourage children to use formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.  Children can also use a blank number line to count on to find the total. Encourage them to jump in multiples of 10 to become more efficient. |  |
| **Subtract 1 and 2-digit numbers to 20**  When subtracting one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten.  Children should be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten frames, number shapes and number lines are particularly useful for this. |  |
| **Subtract 1 and 2-digit numbers to 100**  At this stage, encourage children to use formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.  Children can also use a blank number line to count on to find the difference. Encourage them to jump in multiples of 10 to become more efficient. |  |

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**Addition – Year Two**

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| **Concrete** | **Pictorial** | **Abstract** |
| **Add 1 and 2-digit numbers to 20** | | |
|  |  |  |
| **Add three 1-digit numbers** | | |
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| --- | --- | --- |
| **Concrete** | **Pictorial** | **Abstract** |
| **Add 1-digit and 2-dgit numbers to 100** | | |
|  |  |  |
| **Add two 2-digit numbers to 100.** | | |
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**Subtraction – Year Two**

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| --- | --- | --- |
| **Concrete** | **Pictorial** | **Abstract** |
| **Subtract 1 and 2-digit numbers to 20** | | |
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| **Subtract 1 and 2-digit numbers to 100** | | |
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**St Paul’s CE Primary School – Calculation Policy**

**Addition and Subtraction**

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| **Year Three** | |
| **National Curriculum**  Pupils should be taught to:   * add and subtract numbers mentally, including:   -a three-digit number and ones  -a three-digit number and tens  -a three-digit number and hundreds   * add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction * estimate the answer to a calculation and use inverse operations to check answers * solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. | |
| Golden Threads:   * Calculate complements to 100 * Add and subtract up to three-digit numbers using columnar methods * Manipulate the additive relationship * Understand the inverse relationship between addition and subtraction, and how both relate to the part-part-whole structure * Understand and use the commutative property of addition, and understand the related property for subtraction | |
| **Add two 2-digit numbers to 100.**  At this stage, encourage children to use formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.  Children can also use a blank number line to count on to find the total. Encourage them to jump in multiples of 10 to become more efficient. |  |
| **Add numbers with up to 3 digits**  Base 10 and place value counters are the most effective manipulatives when adding numbers with up to three digits.  Ensure children write out their calculation alongside any concrete resources so that can see the links to the written column method.  Plain counters on a place value grid can also be used to support learning. |  |
| **Subtract numbers with up to 3 digits**  Base 10 and place value counters are the most effective manipulatives when subtracting numbers with up to 3 digits.  Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.  Plain counters on a place value grid can also be used to support learning. |  |

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**Addition– Year Three**

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| --- | --- | --- |
| **Concrete** | **Pictorial** | **Abstract** |
| **Add two 2-digit numbers to 100.** | | |
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| **Add numbers with up to 3 digits** | | |
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| --- | --- | --- |
| **Concrete** | **Pictorial** | **Abstract** |
| **Add two 2-digit numbers to 100.** | | |
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**Subtraction - Year Three**

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| **Concrete** | **Pictorial** | **Abstract** |
| **Subtract numbers with up to 3 digits** | | |
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**St Paul’s CE Primary School – Calculation Policy**

**Addition and Subtraction**

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| **Year Four** | |
| **National Curriculum**  Pupils should be taught to:   * Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate *  estimate and use inverse operations to check answers to a calculation * solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why | |
| **Add two 2-digit numbers to 100.**  Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 4 digits.  Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.  Plain counters on a place value grid can also be used to support learning. |  |
| **Subtract with up to 4 digits**  Base 10 and place value counters are the most effective manipulatives when subtracting numbers with up to 4 digits.  Children write out the calculation alongside any concrete resources so they can see the links to the written column method.  Plan counters on a place value grid can also be used to support learning. |  |

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**Addition– Year Four**

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| **Concrete** | **Pictorial** | **Abstract** |
| **Add numbers with up to 4 digits.** | | |
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**Subtract – Year Four**

|  |  |  |
| --- | --- | --- |
| **Concrete** | **Pictorial** | **Abstract** |
| **Add numbers with up to 4 digits.** | | |
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**St Paul’s CE Primary School – Calculation Policy**

**Addition and Subtraction**

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| **Year Five and Six** | |
| **National Curriculum Year 5**  Pupils should be taught to:   * Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) * add and subtract numbers mentally with increasingly large numbers * use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy * solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why | |
| **National Curriculum Year 6**  Pupils should be taught to:   * use their knowledge of the order of operations to carry out calculations involving the four operations * solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why * use their knowledge of the order of operations to carry out calculations involving the four operations * solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why | |
| **Add numbers with more than 4 digits**  Place value counters or plain counters on a place value grid are the most effective concrete resources when adding numbers with more than 4 digits.  At this stage, children should be encouraged to work in the abstract, using the column method to add larger numbers efficiently. |  |
| **Add with up to three decimal places (Yr5)**  Place value counters and plain counters on a place value grid are the most effective manipulatives when adding decimals with 1, 2 and then 3 decimal places.  Ensure children have experience of adding decimals with a variety of decimal places. This includes putting this into context when adding money and other measures. |  |
| **Subtract numbers with more than 4 digits.**  Place value counters and plain counters on a place value grid are the most effective concrete resource when subtracting numbers with more than 4 digits.  At this stage, children should be encouraged to work in the abstract, using column method to subtract larger numbers efficiently. |  |
| **Subtract numbers with up to 3 decimal places (Year 5).**  Place value counters and plain counters on a place value grid are the most effective manipulative when subtracting decimals with 1, 2 and then 3 decimal places.  Ensure children have experience of subtracting decimals with a variety of decimal places. This includes putting this into context when subtracting money and other measures. |  |

|  |  |  |
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| **Concrete** | **Pictorial** | **Abstract** |
| **Add numbers with more than 4 digits.** | | |
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| **Add numbers with up to three decimal places.** | | |
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**Addition– Year Five and Six**

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**Subtraction– Year Five and Six**

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| **Concrete** | **Pictorial** | **Abstract** |
| **Subtract numbers with more than 4 digits.** | | |
|  | |  |
| **Subtract with up to 3 decimal places.** | | |
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**Times Tables**

**St Paul’s CE Primary School – Calculation Policy**

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| **2 Times Table** | **5 Times Table** |
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| **Year 2:** Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the two times table, using concrete manipulatives to support. Notice how all the numbers are even and there is a pattern in the ones. Use different models to develop fluency. | **Year 2:** Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the five times table, using concrete manipulatives to support. Notice the pattern in the ones as well as highlighting the odd, even, odd, even pattern. |
| **10 Times Table** | **3 Times Table** |
|  |  |
| **Year 2:** Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the ten times table, using concrete manipulatives to support. Notice the pattern in the digits- the ones are always 0, and the tens increase by 1 ten each time. | **Year 3:** Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the three times table, using concrete manipulatives to support. Notice the odd, even, odd, even pattern using support shapes to support. Highlight the pattern in the ones using a hundred square. |
| **4 Times Table** | **8 Times Table** |
|  |  |
| **Year 3:** Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the four times table, using manipulatives to support. Make links to the 2 times table, seeing how each multiple is double the twos. Notice the pattern in the ones within each group of five multiples. Highlight that all the multiples are even using number shapes to support. | **Year 3:** Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the eight times table, using manipulatives to support. Make links to the 4 times table, seeing how each multiple is double the fours. Notice the pattern in the ones within each group of five multiples. Highlight that all the multiples are even using number shapes to support. |

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**Times Tables**

**St Paul’s CE Primary School – Calculation Policy**

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| **6 Times Table** | **9 Times Table** |
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| **Year 4:** Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the six times table, using manipulatives to support. Make links to the 3 times table, seeing how each multiple is double the threes. Notice how all the numbers are even and there is a pattern in the ones. Use different models to develop fluency. | **Year 4:** Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the nine times table, using concrete manipulatives to support. Notice the pattern in the tens and ones using the hundred square to support as well as noting the odd, even pattern within the multiples. |
| **7 Times Table** | **11 Times Table** |
|  |  |
| **Year 4:** Encourage daily counting in multiples both forwards and backwards. The seven times table can be trickier to learn due to the lack of obvious pattern in the numbers, however they already know several facts due to commutativity. Children can still see the odd, even pattern in the multiples using number shapes to support. | **Year 4:** Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the eleven times table, using concrete manipulatives to support. Notice the pattern in the tens and ones using the hundred square to support. Also consider the pattern after crossing 100. |
| **12 Times Table** |  |
|  |  |
| **Year 4:** Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the four times table, using manipulatives to support. Make links to the 2 times table, seeing how each multiple is double the twos. Notice the pattern in the ones within each group of five multiples. Highlight that all the multiples are even using number shapes to support. |

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**St Paul’s CE Primary School – Calculation Policy**

**Multiplication and Division**

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| **Year One** | |
| **National Curriculum Year 1**  Pupils should be taught to:   * 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. | |
| **Golden Threads:**   * Develop fluency in addition and subtraction facts within 10. * Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any multiple, and count forwards and backwards through the odd numbers. | |
| **National Curriculum Year 2**  Pupils should be taught to:   * recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers * calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs * show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot * solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts. | |
| **Golden Threads:**   * Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2, 5 and 10 multiplication tables. * Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotative division). | |
| **Solve 1-step problems using multiplication.**  Children represent multiplication as repeated addition in many different ways.  In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record multiplication formally.  In Year 2, children are introduced to the multiplication symbol. |  |
| **Solve 1-step problems using multiplication (sharing).**  Children solve problems by sharing amounts into equal groups.  In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record division formally.  In Year 2, children are introduced to the division symbol. |  |
| **Solve 1-step problems using multiplication (grouping).**  Children solve problems by grouping and counting the number of groups. Grouping encourages children to count in multiples and links to repeated subtraction on a number line.  They can use concrete representation in fixed groups such as number shapes which helps to show the link between multiplication and division. |  |

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**Multiplication– Year One and Two**

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| **A couple of bowls with fruit in them  Description automatically generatedConcrete** | **A diagram of a number of red green and white squares  Description automatically generatedPictorial** | **A black rectangular object with numbers  Description automatically generatedAbstract** |
| **Solve 1-step problems using multiplication.** | | |
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**Division – Year One and Two**

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| **A couple of bowls with fruit in them  Description automatically generatedConcrete** | **A diagram of a number of red green and white squares  Description automatically generatedPictorial** | **A black rectangular object with numbers  Description automatically generatedAbstract** |
| **Solve 1-step problems using multiplication (sharing)** | | |
|  |  |  |
| **Solve 1-step problems using multiplication (grouping)** | | |
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**Multiplication and Division**

**St Paul’s CE Primary School – Calculation Policy**

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| **Year Three** | |
| **National Curriculum Year 3**  Pupils should be taught to:   * recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables * write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for twodigit numbers times one-digit numbers, using mental and progressing to formal written methods * solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects | |
| **Golden Threads:**   * Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number. * Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10). * Apply known multiplication and division facts to solve contextual problems with different structures, including quotitive and partitive division. | |
| **Multiply 2-digit numbers by 1-digit numbers.**  Informal methods and the expanded method are used in Year 3 before moving on to the short multiplication method in Year 4.  Place value counters should be used to support the  understanding of the method rather than supporting the multiplication, as children should use times table knowledge. |  |
| **Divide 2-digits by 1-digit (sharing with no exchange).**  When diving larger numbers, children can use manipulatives that allow them to partition into tens and ones.  Straws, Base 10 and place value counters can all be used to share numbers into equal groups. Part-whole models can provide children with a clear written method that matches the concrete representation. |  |
| **Divide 2-digits by 1-digit (sharing with exchange).**  When diving numbers involving an exchange, children can use Base 10 and place value counters to exchange one ten for ten ones. Children should start with the equipment outside the place value grid before sharing the tens and ones equally between the rows.  Flexible partitioning in a part-whole model supports this method. |  |
| **Divide 2-digits by 1-digit (sharing with remainders).**  When diving numbers with remainders, children can use Base 10 and place value counters to exchange one ten for ten ones. Starting with the equipment outside the place value grid will highlight remainders, as they will be left outside the grid once the equal groups have been made.  Flexible partitioning in a part-whole model supports this method. |  |

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| **A couple of bowls with fruit in them  Description automatically generatedConcrete** | **A diagram of a number of red green and white squares  Description automatically generatedPictorial** | **A black rectangular object with numbers  Description automatically generatedAbstract** |
| **Multiply 2-digit numbers by 1-digit numbers.** | | |
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**Multiplication – Year Three**

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**Division – Year Three**

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| **A couple of bowls with fruit in them  Description automatically generatedConcrete** | | **A diagram of a number of red green and white squares  Description automatically generatedPictorial** | **A black rectangular object with numbers  Description automatically generatedAbstract** |
| **Divide 2-digits by 1-digit (sharing with no exchange)** | | | |
|  | | |  |
| **Divide 2-digits by 1-digit (sharing with exchange)** | | | |
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| **Divide 2-digits by 1-digit (sharing with remainders)** | | | |
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**St Paul’s CE Primary School – Calculation Policy**

**Multiplication and Division**

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| **Year Four** | |
| **National Curriculum Year 4**  Pupils should be taught to:   * recall multiplication and division facts for multiplication tables up to 12 × 12 * use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers * recognise and use factor pairs and commutativity in mental calculations * multiply two-digit and three-digit numbers by a onedigit number using formal written layout * solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects | |
| **Golden Threads:**   * **Recall multiplication and division facts up to 12 × 12 and recognise products in multiplication tables as multiples of the corresponding number.** * **Solve division problems, with two-digit dividends and one-digit divisors, that involve remainders, and interpret remainders appropriately according to the context.** * **Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 100).** * **Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size.** * **Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication.** * **Understand and apply the distributive property of multiplication.** | |
| **Multiply 2-digit numbers by 1-digit numbers.**  Informal methods and the expanded method are used in Year 3 before moving on to the short multiplication method in Year 4.  Place value counters should be used to support the  understanding of the method rather than supporting the multiplication, as children should use times table knowledge. | A screenshot of a math exercise  Description automatically generated |
| **Multiply 3-digit numbers by 1-digit numbers.**  When moving to 3-digit by 1-digit multiplication, encourage children to move towards the short, formal written method.  Base 10 and place value counters continue to support the understanding of the written method. Limit the number of exchanges needed in the questions and move children away from resources when multiplying larger numbers. |  |
| **Divide 2-digits by 1-digit (sharing with exchange).**  When diving numbers involving an exchange, children can use Base 10 and place value counters to exchange one ten for ten ones. Children should start with the equipment outside the place value grid before sharing the tens and ones equally between the rows.  Flexible partitioning in a part-whole model supports this method. | A group of maths with numbers and circles  Description automatically generated |
| **Divide 2-digits by 1-digit (sharing with remainders).**  When diving numbers with remainders, children can use Base 10 and place value counters to exchange one ten for ten ones. Starting with the equipment outside the place value grid will highlight remainders, as they will be left outside the grid once the equal groups have been made.  Flexible partitioning in a part-whole model supports this method. | A screenshot of a math test  Description automatically generated |

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**Multiplication – Year Four**

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| **A couple of bowls with fruit in them  Description automatically generatedConcrete** | **A diagram of a number of red green and white squares  Description automatically generatedPictorial** | **A black rectangular object with numbers  Description automatically generatedAbstract** |
| **Multiply 2-digit numbers by 1-digit numbers.** | | |
| A close-up of a number chart  Description automatically generated | | A grid with black letters and numbers  Description automatically generated |
| **Multiply 3-digit numbers by 1-digit numbers.** | | |
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**Division – Year Four**

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| --- | --- | --- | --- |
| **A couple of bowls with fruit in them  Description automatically generatedConcrete** | | **A diagram of a number of red green and white squares  Description automatically generatedPictorial** | **A black rectangular object with numbers  Description automatically generatedAbstract** |
| **Divide 2-digits by 1-digit (sharing with exchange)** | | | |
| A screenshot of a computer  Description automatically generated | A number and question marks  Description automatically generated | | A black and white rectangular object with numbers and symbols  Description automatically generated |
| **Divide 2-digits by 1-digit (sharing with remainders)** | | | |
| A screenshot of a computer game  Description automatically generated | A number and a number  Description automatically generated | | A math equation with numbers and symbols  Description automatically generated |

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**St Paul’s CE Primary School – Calculation Policy**

**Multiplication and Division**

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| --- | --- |
| **Year Five** | |
| **National Curriculum Year 5**  Pupils should be taught to:   * identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers * know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers * establish whether a number up to 100 is prime and recall prime numbers up to 19 * recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3) * multiply numbers up to 4 digits by a one- or twodigit number using a formal written method, including long multiplication for two-digit numbers • multiply and divide numbers mentally drawing upon known facts * divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context * multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 * solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes * solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates * solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign | |
| **Golden Threads:**   * Secure fluency in multiplication table facts, and corresponding division facts, through continued practice. * Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth). * Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size. * Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors. * Multiply any whole number with up to 4 digits by any one-digit number using a formal written method. * Divide a number with up to 4 digits by a onedigit number using a formal written method, and interpret remainders appropriately for the context. | |
| **Multiply 4-digit numbers by 1-digit numbers**  When multiplying 4- digit numbers, place value counters are the best manipulative to use to support children in their understanding of the formal written method.  If children are multiplying larger numbers and struggling with their times tables, encourage the use of multiplication grids so children can focus on the use of the written method. |  |
| **Multiply 2-digit numbers by 2-digit numbers.**  When multiplying a multi-digit number by 2-digits, use the area model to help children understand the size of the numbers they are using. This links to finding the area of a rectangle by finding the space covered by the Base 10.  The grid method matches the area model as an initial written method before moving on to the formal written multiplication method |  |
| **Multiply 3-digit numbers by 2-digit numbers.**  Children can continue to use the area model when multiplying 3- digits by 2-digits. Place value counters become more efficient to use but Base 10 can be used to highlight the size of numbers.  Children should now move towards the formal written method, seeing the links with the grid method. |  |
| **Multiply 4-digit numbers by 2-digit numbers.**  When multiplying 4- digits by 2-digits, children should be confident in using the formal written method.  If they are still struggling with times tables, provide multiplication grids to support when they are focusing on the use of the method.  Consider where exchanged digits are placed and make sure this is consistent. |  |
| **Divide 2-digits by 1-digit (grouping)**  When using the short division method, children use grouping. Starting with the largest place value, they group by the divisor.  Language is important here. Children should consider ‘How many groups of 4 tens can we make?’ and ‘How many groups of 4 ones can we make?’  Remainders can also be seen as they are left ungrouped |  |
| **Divide 3-digits by 1-digit (grouping)**  Children can continue to use grouping to support their understanding of short division when dividing a 3-digit number by a 1-digit number.  Place value counters or plain counters can be used on a place value grid to support this understanding. Children can also draw their own counters and group them through a more pictorial method. |  |
| **Divide 4-digits by 1-digit (grouping)**  Place value counters or plain counters can be used on a place value grid to support children to divide 4- digits by 1-digit.  Children can also draw their own counters and group them through a more pictorial method. Children should be encouraged to move away from the concrete and pictorial when dividing numbers with multiple exchanges |  |

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**Multiplication – Year Five**

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| **Multiply 4-digit numbers by 1-digit numbers.** | | |
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| **Multiply 2-digit numbers by 2-digit numbers.** | | |
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| **Multiply 3-digit numbers by 2-digit numbers.** | | |
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| **Multiply 4-digit numbers by 2-digit numbers.** | | |
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**Division – Year Five**

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| **Divide 3-digits by 1-digit (grouping)** | | |
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| **Divide 4-digits by 1-digit (grouping)** | | |
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**St Paul’s CE Primary School – Calculation Policy**

**Multiplication and Division**

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| **Year Six** | |
| **National Curriculum Year 6**  Pupils should be taught to:   * identify common factors, common multiples and prime numbers * use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy * multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication * • divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context * divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context * perform mental calculations, including with mixed operations and large numbers * solve problems involving addition, subtraction, multiplication and division * use their knowledge of the order of operations to carry out calculations involving the four operations | |
| **Golden Threads:**   * **Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).** * **Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.** * **Solve problems involving ratio relationships.** * **Solve problems with 2 unknowns.** | |
| **Multiply 4-digit numbers by 2-digit numbers**  When multiplying 4- digits by 2-digits, children should be confident in using the formal written method.  If they are still struggling with times tables, provide multiplication grids to support when they are focusing on the use of the method.  Consider where exchanged digits are placed and make sure this is consistent. | A screenshot of a math game  Description automatically generated |
| **Divide multi-digits by 2-digits (short division)**  When children begin to divide up to 4- digits by 2-digits, written methods become the most accurate as concrete and pictorial representations become less effective.  Children can write out multiples to support their calculations with larger remainders. Children will also solve problems with remainders where the quotient can be rounded as appropriate. |  |
| **Divide multi-digits by 2-digits (long division)**  Children can also divide by 2-digit numbers using long division.  Children can write out multiples to support their calculations with larger remainders.  Children will also solve problems with remainders where the quotient can be rounded as appropriate group them through a more pictorial method. |  |
| **Divide multi-digits by 2-digits (long division)**  When a remainder is left at the end of a calculation, children can either leave it as a remainder or convert it to a fraction. This will depend on the context of the question.  Children can also answer questions where the quotient needs to be rounded according to the context |  |

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**Multiplication – Year Six**

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| **Multiply 4-digit numbers by 2-digit numbers.** | | |
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**Division – Year Six**

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| **Divide multi-digits by 2-digits (short division)** | | |
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| **Divide multi-digits by 2-digits (short division)** | | |
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