

The Asfordby Hill School



Mathematics POLICY

This Policy Links With: Teaching and Learning Policy Mathematics SEN More Able	
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A Introduction

This policy outlines the teaching, organisation and management of the mathematics taught and learnt at Asfordby Hill School.

The school's policy for mathematics is based on the document '2014 National Curriculum'. It has been drawn up as a result of staff discussion and has the full agreement of the Governing Body. The implementation of this policy is the responsibility of all the teaching staff.

B Teaching Mathematics

Teaching time

To provide adequate time for developing mathematical skills, each class teacher will provide a daily mathematics lesson/activity. This may vary in length but will usually last for about 40 minutes in Key Stage 1 and 50 to 60 minutes in Key Stage 2.

Class Organisation

From Year 1, all pupils will have a dedicated daily mathematics lesson/activity. Within these lessons, there will be a good balance between whole-class work, group teaching and individual practice and enrichment.

A typical lesson

A typical 40 to 60 minute lesson in Year 1 to 6 could be structured like this:

- Oral work and mental calculation (about 5 to 10 minutes)
This will involve whole-class work to rehearse, sharpen and develop mental and oral skills.
- The main teaching and/or activity (about 20 to 30 minutes) based on one learning objective. This could include teaching input and/or pupil activities and a balance between whole class, grouped, paired and individual work.
- A plenary (about 10 to 15 minutes) This will involve work with the whole class to sort out misconceptions, identify progress, to summarise key facts and ideas and what to remember, to make links to other work and to discuss next steps.

Out-of-class work and homework

The daily mathematics lessons will provide opportunities for children to practice and consolidate their skills and knowledge, to develop and extend their techniques and strategies, and to prepare for their future learning. These will be extended through out-of-class activities or homework. These activities will be short and focused and will be referred to and valued in future lessons.

Links between mathematics and other subjects

Mathematics contributes to many subjects within the primary curriculum and opportunities will be sought to draw mathematical experience out of a wide range of activities. This will allow children to begin to use and apply mathematics in real contexts and deepen their learning.

C School and Class Organisation

Alongside this policy, Asfordby Hill follows a calculation policy that sets out agreed strategies, models and images as well as mental arithmetic expectations from EYFS to year 6.

How we cater for pupils who are more able

More able pupils will be taught with their own class and stretched through differentiated group work and extra challenges of enrichment activities.

How we cater for pupils with particular needs

The daily mathematics lesson is appropriate for almost all pupils. Teachers will involve all pupils through differentiation, offering activities that cater to a variety of learning styles.

Pupils with special educational needs.

Teachers will aim to include all pupils fully in their daily mathematics lessons. All children benefit from the emphasis on oral and mental work and participating in watching and listening to other children demonstrating and explaining their methods. However, a pupil whose difficulties are severe or complex may need to be supported with an individualised programme in the main part of the lesson.

How we work in EYFS

In EYFS the class will be organised through an integrated day, to promote social skills and the development of mathematical language and understanding. Much of the learning will take place through group work, play and exploration.

Resources

Practical equipment (3D/2D shapes, dice, clock faces, capacity containers, scales etc) are stored in the corridor on the way to the 'Quiet room' and in the Quiet Room itself.

Number lines/Bead strings/ Number squares are stored in all classrooms. Calculators are available for all children to use (but not as a replacement of mathematical strategies) and stored in classrooms.

Computing

Technology will be used in various ways to support teaching and motivate children's learning. It could involve the computer (eg ITP's, Espresso, Interactive whiteboards, Abacus games), calculators, and audio-visual aids. They will, however, only be used in a daily mathematics lesson when it is the most efficient and effective way of meeting the lesson objectives.

Assessment

Assessment will take place at three connected levels: short-term, medium-term and long-term. These assessments will be used to inform teaching in a continuous cycle of planning, teaching and assessment.

Short-term assessments (including pre-assessments) will be an informal part of every lesson to check children's understanding and give information, which will help to adjust day-to-day lesson plans. Either written or oral feedback will be given to the children focussing on misconceptions, accurate understanding or next steps. (see appendix sheet) Self/Peer assessment is also an invaluable strategy for children to understand their strengths and areas for development.

Medium-term assessments will take place at the end of or during (if applicable) each unit/theme of work. The outcomes will be recorded using the ‘Not As We Know It’ grids which list targets taken from the 2014 National Curriculum Framework. The following scores are being trialled:

Score 1: If the child is practicing the skill or needs further consolidation

Score 2: If the child is independently applying the skill

Score 3: If the child is successfully manipulating the skill to solve enrichment activities in real life situations or other subjects.

Long-term assessments will take place towards the end of the school year to assess and review pupils’ progress and attainment. These will be made through a variety of methods including NFER tests and informal teacher assessments. Teachers will also draw upon their class record of attainment on the grids and supplementary notes and knowledge about their class to produce a summative record. Accurate information will then be reported to parents and the child’s next teacher.

D Management of Mathematics

Role of the Coordinator

- Teach demonstration lessons
- Ensure teachers are familiar with the New Curriculum and help them to plan lessons
- Lead by example in the way they teach in their own classroom
- Prepare, organise and lead INSET, with the support of the Headteacher
- Work co-operatively with the SENCO
- Observe colleagues from time to time with a view to identifying the support they need
- Attend INSET
- Inform parents
- Discuss regularly with the headteacher and the numeracy governor the progress of implementing the Strategy in the school.
- Analyse data and class assessments to identify school strengths and areas for development.

Role of the Headteacher

- Lead, manage and monitor the implementation of the Strategy, including monitoring teaching plans and the quality of teaching in classrooms
- With the Numeracy governor, keep the governing body informed about the progress of the Strategy
- Ensure that mathematics remains a high profile in the school’s development work
- Deploy support staff to maximise support for the Strategy



Asfordby Hill Calculation Policy

KEY STAGE 1

Children in Years 1 and 2 will be given a really solid foundation in the basic building blocks of mental and written arithmetic. Through being taught place value, children will develop an understanding of how numbers work, so that they are confident with 2-digit numbers and beginning to read and say numbers above 100.

Addition and Subtraction: A focus on number bonds, first via practical hands-on experiences and subsequently using memorisation techniques, enables a good grounding in these crucial facts, and ensures that all children leave Year 2 knowing the pairs of numbers which make all the numbers up to 10 at least. Children will also have experienced and been taught pairs to 20. Children's knowledge of number facts enables them to add several 1-digit numbers, and to add/subtract a 1-digit number to/from a 2-digit number. Another important conceptual tool is the ability to add/subtract 1 or 10, and to understand which digit changes and why. This understanding is extended to enable children to add and subtract multiples of 10 to and from any 2-digit number. The most important application of this knowledge is the ability to add or subtract any pair of 2-digit numbers by counting on or back in 10s and 1s. Children may extend this to adding by partitioning numbers into 10s and 1s.

Multiplication and Division: Children will be taught to count in 2s, 3s, 5s and 10s, and will relate this skill to repeated addition. Children will meet and begin to learn the associated $\times 2$, $\times 3$, $\times 5$ and $\times 10$ tables. Engaging in a practical way with the concept of repeated addition and the use of arrays enables children to develop a preliminary understanding of multiplication, and asking them to consider how many groups of a given number make a total will introduce them to the idea of division. Children will also be taught to double and halve numbers, and will thus experience scaling up or down as a further aspect of multiplication and division.

Fractions: Fractions will be introduced as numbers and as operators, specifically in relation to halves, quarters and thirds.

Year 1

	Mental calculation	Written calculation	Default for ALL children
Y1 +	Number bonds ('story' of 5, 6, 7, 8, 9 and 10) Count on in 1s from a given 2-digit number Add two 1-digit numbers Add three 1-digit numbers, spotting doubles or pairs to 10 Count on in 10s from any given 2-digit number Add 10 to any given 2-digit number Use number facts to add 1-digit numbers to 2-digit numbers e.g. Use $4 + 3$ to work out $24 + 3$, $34 + 3$ Add by putting the larger number first		Pairs with a total of 10 Count in 1s Count in 10s Count on 1 from any given 2-digit number

Y1 –	Number bonds ('story' of 5, 6, 7, 8, 9 and 10) Count back in 1s from a given 2-digit number Subtract one 1-digit number from another Count back in 10s from any given 2-digit number Subtract 10 from any given 2-digit number Use number facts to subtract 1-digit numbers from 2-digit numbers e.g. <i>Use 7 – 2 to work out 27 – 2, 37 – 2</i>		Pairs with a total of 10 Count back in 1s from 20 to 0 Count back in 10s from 100 to 0 Count back 1 from any given 2-digit number
Y1 ×	Begin to count in 2s, 5s and 10s Begin to say what three 5s are by counting in 5s, or what four 2s are by counting in 2s, etc. Double numbers to 10		Begin to count in 2s and 10s Double numbers to 5 using fingers
Y1 ÷	Begin to count in 2s, 5s and 10s Find half of even numbers to 12 and know it is hard to halve odd numbers Find half of even numbers by sharing Begin to use visual and concrete arrays or 'sets of' to find how many sets of a small number make a larger number		Begin to count in 2s and 10s Find half of even numbers by sharing
Year 2			
	Mental calculation	Written calculation	Default for ALL children
Y2 +	Number bonds – know all the pairs of numbers which make all the numbers to 12, and pairs with a total of 20 Count on in 1s and 10s from any given 2-digit number Add two or three 1-digit numbers Add a 1-digit number to any 2-digit number using number facts, including bridging multiples of 10 e.g. $45 + 4$ e.g. $38 + 7$ Add 10 and small multiples of 10 to any given 2-digit number		Know pairs of numbers which make each total up to 10 Add two 1-digit numbers Add a 1-digit number to a 2-digit number by counting on in 1s Add 10 and small multiples of 10 to a 2-digit number by counting on in 10s

	Add any pair of 2-digit numbers		
Y2 –	<p>Number bonds – know all the pairs of numbers which make all the numbers to 12</p> <p>Count back in 1s and 10s from any given 2-digit number</p> <p>Subtract a 1-digit number from any 2-digit number using number facts, including bridging multiples of 10</p> <p>e.g. $56 - 3$</p> <p>e.g. $53 - 5$</p> <p>Subtract 10 and small multiples of 10 from any given 2-digit number</p> <p>Subtract any pair of 2-digit numbers by counting back in 10s and 1s or by counting up</p>		<p>Know pairs of numbers which make each total up to 10</p> <p>Subtract a 1-digit number from a 2-digit number by counting back in 1s</p> <p>Subtract 10 and small multiples of 10 from a 2-digit number by counting back in 10s</p>
Y2 ×	<p>Count in 2s, 5s and 10s</p> <p>Begin to count in 3s</p> <p>Begin to understand that multiplication is repeated addition and to use arrays</p> <p>e.g. 3×4 is three rows of 4 dots</p> <p>Begin to learn the $\times 2$, $\times 3$, $\times 5$ and $\times 10$ tables, seeing these as 'lots of'</p> <p>e.g. 5 lots of 2, 6 lots of 2, 7 lots of 2</p> <p>Double numbers up to 20</p> <p>Begin to double multiples of 5 to 100</p> <p>Begin to double 2-digit numbers less than 50 with 1s digits of 1, 2, 3, 4 or 5</p>		<p>Count in 2s, 5s and 10s</p> <p>Begin to use and understand simple arrays</p> <p>e.g. 2×4 is two lots of four</p> <p>Double numbers up to 10</p> <p>Double multiples of 10 to 50</p>
Y2 ÷	<p>Count in 2s, 5s and 10s</p> <p>Begin to count in 3s</p> <p>Using fingers, say where a given number is in the 2s, 5s or 10s count</p> <p>e.g. 8 is the fourth number when I count in 2s</p> <p>Relate division to grouping</p> <p>e.g. How many groups of 5 in 15?</p> <p>Halve numbers to 20</p>		<p>Count in 2s, 5s and 10s</p> <p>Say how many rows in a given array</p> <p>e.g. How many rows of 5 are in an array of 3×5?</p> <p>Halve numbers to 12</p> <p>Find $\frac{1}{2}$ of amounts</p>

	Begin to halve numbers to 40 and multiples of 10 to 100 Find $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{3}{4}$ of a quantity of objects and of amounts (whole number answers)		
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LOWER KEY STAGE 2

In Lower Key Stage 2, children build on the concrete and conceptual understandings they have gained in Key Stage 1 to develop a real mathematical understanding of the four operations, in particular developing arithmetical competence in relation to larger numbers.

Addition and subtraction: Children are taught to use place value and number facts to add and subtract numbers mentally and they will develop a range of strategies to enable them to discard the 'counting in 1s' or fingers-based methods of Key Stage 1. In particular, children will learn to add and subtract multiples and near multiples of 10, 100 and 1000, and will become fluent in complementary addition as an accurate means of achieving fast and accurate answers to 3-digit subtractions. Standard written methods for adding larger numbers are taught, learned and consolidated, and written column subtraction is also introduced.

Multiplication and division: This key stage is also the period during which all the multiplication and division facts are thoroughly memorised, including all facts up to 12×12 . Efficient written methods for multiplying or dividing a 2-digit or 3-digit number by a 1-digit number are taught, as are mental strategies for multiplication or division with large but 'friendly' numbers, e.g. when dividing by 5 or multiplying by 20.

Fractions and decimals: Children will develop their understanding of fractions, learning to reduce a fraction to its simplest form, as well as finding non-unit fractions of amounts and quantities. The concept of a decimal number is introduced and children consolidate a firm understanding of 1-place decimals, multiplying and dividing whole numbers by 10 and 100.

Year 3

	Mental calculation	Written calculation	Default for ALL children
Y3 +	Know pairs with each total to 20 e.g. $2 + 6 = 8$, $12 + 6 = 18$, $7 + 8 = 15$ Know pairs of multiples of 10 with a total of 100 Add any two 2-digit numbers by counting on in 10s and 1s or by using partitioning Add multiples and near multiples of 10 and 100 Perform place-value additions without a struggle e.g. $300 + 8 + 50 = 358$ Use place value and number facts to add a 1-digit or 2-digit number to a 3-digit number e.g. $104 + 56$ is 160 since $104 + 50 = 154$ and $6 + 4 = 10$ $676 + 8$ is 684 since $8 = 4 + 4$ and $76 + 4 + 4 = 84$ Add pairs of 'friendly' 3-digit numbers e.g. $320 + 450$ Begin to add amounts of money using partitioning	Use expanded column addition to add two or three 3-digit numbers or three 2-digit numbers Begin to use compact column addition to add numbers with 3 digits Begin to add like fractions e.g. $\frac{3}{8} + \frac{1}{8} + \frac{1}{8}$ Recognise fractions that add to 1 e.g. $\frac{1}{4} + \frac{3}{4}$ e.g. $\frac{3}{5} + \frac{2}{5}$	Know pairs of numbers which make each total up to 10, and which total 20 Add two 2-digit numbers by counting on in 10s and 1s e.g. $56 + 35$ is $56 + 30$ and then add the 5 Understand simple place-value additions e.g. $200 + 40 + 5 = 245$ Use place value to add multiples of 10 or 100

<p>Y3 —</p>	<p>Know pairs with each total to 20 e.g. $8 - 2 = 6$ e.g. $18 - 6 = 12$ e.g. $15 - 8 = 7$ Subtract any two 2-digit numbers Perform place-value subtractions without a struggle e.g. $536 - 30 = 506$ Subtract 2-digit numbers from numbers > 100 by counting up e.g. <i>143 - 76 is done by starting at 76. Then add 4 (80), then add 20 (100), then add 43, making the difference a total of 67</i> Subtract multiples and near multiples of 10 and 100 Subtract, when appropriate, by counting back or taking away, using place value and number facts Find change from £1, £5 and £10</p>	<p>Use counting up as an informal written strategy for subtracting pairs of 3-digit numbers e.g. $423 - 357$ Begin to subtract like fractions e.g. $\frac{7}{8} - \frac{3}{8}$</p>	<p>Know pairs of numbers which make each total up to 10, and which total 20 Count up to subtract 2-digit numbers e.g. $72 - 47$ Subtract multiples of 5 from 100 by counting up e.g. $100 - 35$ Subtract multiples of 10 and 100</p>
<p>Y3 ×</p>	<p>Know by heart all the multiplication facts in the $\times 2$, $\times 3$, $\times 4$, $\times 5$, $\times 8$ and $\times 10$ tables Multiply whole numbers by 10 and 100 Recognise that multiplication is commutative Use place value and number facts in mental multiplication e.g. 30×5 is 15×10 Partition teen numbers to multiply by a 1-digit number e.g. 3×14 as 3×10 and 3×4 Double numbers up to 50</p>	<p>Use partitioning (grid multiplication) to multiply 2-digit and 3-digit numbers by 'friendly' 1-digit numbers</p>	<p>Know by heart the $\times 2$, $\times 3$, $\times 5$ and $\times 10$ tables Double given tables facts to get others Double numbers up to 25 and multiples of 5 to 50</p>

<p>Y3</p> <p>÷</p>	<p>Know by heart all the division facts derived from the x2, x3, x4, x5, x8 and x10 tables</p> <p>Divide whole numbers by 10 or 100 to give whole number answers</p> <p>Recognise that division is not commutative</p> <p>Use place value and number facts in mental division</p> <p>e.g. $84 \div 4$ is half of 42</p> <p>Divide larger numbers mentally by subtracting the 10th multiple as appropriate, including those with remainders</p> <p>e.g. $57 \div 3$ is $10 + 9$ as $10 \times 3 = 30$ and $9 \times 3 = 27$</p> <p>Halve even numbers to 100, halve odd numbers to 20</p>	<p>Perform divisions just above the 10th multiple using horizontal or vertical jottings and understanding how to give a remainder as a whole number</p> <p>Find unit fractions of quantities and begin to find non-unit fractions of quantities</p>	<p>Know by heart the division facts derived from the x2, x3, x5 and x10 tables</p> <p>Halve even numbers up to 50 and multiples of 10 to 100</p> <p>Perform divisions within the tables including those with remainders</p> <p>e.g. $38 \div 5$</p>
<p>Year 4</p>			
	<p>Mental calculation</p>	<p>Written calculation</p>	<p>Default for ALL children</p>
<p>Y4</p> <p>+</p>	<p>Add any two 2-digit numbers by partitioning or counting on</p> <p>Know by heart/quickly derive number bonds to 100 and to £1</p> <p>Add to the next 100, £1 and whole number</p> <p>e.g. $234 + 66 = 300$</p> <p>e.g. $3 \cdot 4 + 0 \cdot 6 = 4$</p> <p>Perform place-value additions without a struggle</p> <p>e.g. $300 + 8 + 50 + 4000 = 4358$</p> <p>Add multiples and near multiples of 10, 100 and 1000</p> <p>Add £1, 10p, 1p to amounts of money</p> <p>Use place value and number facts to add 1-, 2-, 3- and 4-digit numbers where a mental calculation is appropriate</p> <p>e.g. $4004 + 156$ by knowing that $6 + 4 = 10$ and</p>	<p>Column addition for 3-digit and 4-digit numbers</p> <p>e.g.</p> $ \begin{array}{r} 5347 \\ 2286 \\ +1495 \\ \hline 9128 \end{array} $ <p>Add like fractions</p> <p>e.g. $\frac{3}{5} + \frac{4}{5} = \frac{7}{5} = 1 \frac{2}{5}$</p> <p>Be confident with fractions that add to 1 and fraction complements to 1</p> <p>e.g. $\frac{2}{3} + _ = 1$</p>	<p>Add any 2-digit numbers by partitioning or counting on</p> <p>Number bonds to 20</p> <p>Know pairs of multiples of 10 with a total of 100</p> <p>Add 'friendly' larger numbers using knowledge of place value and number facts</p> <p>Use expanded column addition to add 3-digit numbers</p>

	<p>that $4004 + 150 = 4154$ so the total is 4160</p>		
<p>Y4 –</p>	<p>Subtract any two 2-digit numbers Know by heart/quickly derive number bonds to 100 Perform place-value subtractions without a struggle e.g. $4736 - 706 = 4030$ Subtract multiples and near multiples of 10, 100, 1000, £1 and 10p Subtract multiples of 0.1 Subtract by counting up e.g. $503 - 368$ is done by adding $368 + 2 + 30 + 100 + 3$ (so we added 135) Subtract, when appropriate, by counting back or taking away, using place value and number facts Subtract £1, 10p, 1p from amounts of money Find change from £10, £20 and £50</p>	<p>Use expanded column subtraction for 3- and 4-digit numbers Use complementary addition to subtract amounts of money, and for subtractions where the larger number is a near multiple of 1000 or 100 e.g. $2002 - 1865$ Subtract like fractions e.g. $\frac{4}{5} - \frac{3}{5} = \frac{1}{5}$ Use fractions that add to 1 to find fraction complements to 1 e.g. $1 - \frac{2}{3} = \frac{1}{3}$</p>	<p>Use counting up with confidence to solve most subtractions, including finding complements to multiples of 100 e.g. $512 - 287$ e.g. $67 + _ = 100$</p>
<p>Y4 ×</p>	<p>Know by heart all the multiplication facts up to 12×12 Recognise factors up to 12 of 2-digit numbers Multiply whole numbers and 1-place decimals by 10, 100, 1000 Multiply multiples of 10, 100 and 1000 by 1-digit numbers e.g. 300×6 e.g. 4000×8 Use understanding of place value and number facts in mental multiplication e.g. 36×5 is half of 36×10 e.g. $50 \times 60 = 3000$ Partition 2-digit numbers to multiply by a 1-digit</p>	<p>Use a vertical written method to multiply a 1-digit number by a 3-digit number (ladder method) Use an efficient written method to multiply a 2-digit number by a number between 10 and 20 by partitioning (grid method)</p>	<p>Know by heart multiplication tables up to 10×10 Multiply whole numbers by 10 and 100 Use the grid method to multiply a 2-digit or a 3-digit number by a number ≤ 6</p>

	<p>number mentally e.g. 4×24 as 4×20 and 4×4 Multiply near multiples by rounding e.g. 33×19 as $(33 \times 20) - 33$ Find doubles to double 100 and beyond using partitioning Begin to double amounts of money e.g. $£35.60$ doubled is $£71.20$</p>		
<p>Y4 <div style="text-align: center;">÷</div></p>	<p>Know by heart all the division facts up to $144 \div 12$ Divide whole numbers by 10, 100, to give whole number answers or answers with 1 decimal place Divide multiples of 100 by 1-digit numbers using division facts e.g. $3200 \div 8 = 400$ Use place value and number facts in mental division e.g. $245 \div 20$ is half of $245 \div 10$ Divide larger numbers mentally by subtracting the 10th or 20th multiple as appropriate e.g. $156 \div 6$ is $20 + 6$ as $20 \times 6 = 120$ and $6 \times 6 = 36$ Find halves of even numbers to 200 and beyond using partitioning Begin to halve amounts of money e.g. half of $£52.40$ is $£26.20$</p>	<p>Use a written method to divide a 2-digit or a 3-digit number by a 1-digit number Give remainders as whole numbers Begin to reduce fractions to their simplest forms Find unit and non-unit fractions of larger amounts</p>	<p>Know by heart all the division facts up to $100 \div 10$ Divide whole numbers by 10 and 100 to give whole number answers or answers with 1 decimal place Perform divisions just above the 10th multiple using the written layout and understanding how to give a remainder as a whole number Find unit fractions of amounts</p>

UPPER KEY STAGE 2

Children move on from dealing mainly with whole numbers to performing arithmetic operations with both decimals and fractions.

Addition and subtraction: Children will consolidate their use of written procedures in adding and subtracting whole numbers with up to 6 digits and also decimal numbers with up to 2 decimal places. Mental strategies for adding and subtracting increasingly large numbers will also be taught. These will draw upon children's robust understanding of place value and knowledge of number facts. Negative numbers will be added and subtracted.

Multiplication and division: Efficient and flexible strategies for mental multiplication and division are taught and practised, so that children can perform appropriate calculations even when the numbers are large, such as $40\,000 \times 6$ or $40\,000 \div 8$. In addition, it is in Years 5 and 6 that children extend their knowledge and confidence in using written algorithms for multiplication and division.

Fractions, decimals, percentages and ratio: Fractions and decimals are also added, subtracted, divided and multiplied, within the bounds of children's understanding of these more complicated numbers. Children will also calculate simple percentages and ratios.

Year 5

	Mental calculation	Written calculation	Default for ALL children
Y5 +	<p>Know number bonds to 1 and to the next whole number</p> <p>Add to the next 10 from a decimal number e.g. $13.6 + 6.4 = 20$</p> <p>Add numbers with 2 significant digits only, using mental strategies e.g. $3.4 + 4.8$ e.g. $23\,000 + 47\,000$</p> <p>Add 1- or 2-digit multiples of 10, 100, 1000, 10 000 and 100 000 e.g. $8000 + 7000$ e.g. $600\,000 + 700\,000$</p> <p>Add near multiples of 10, 100, 1000, 10 000 and 100 000 to other numbers e.g. $82\,472 + 30\,004$</p> <p>Add decimal numbers which are near multiples of 1 or 10, including money e.g. $6.34 + 1.99$ e.g. $\pounds 34.59 + \pounds 19.95$</p> <p>Use place value and number facts to add two or</p>	<p>Use column addition to add two or three whole numbers with up to 5 digits</p> <p>Use column addition to add any pair of 2-place decimal numbers, including amounts of money</p> <p>Begin to add related fractions using equivalences e.g. $\frac{1}{2} + \frac{1}{6} = \frac{3}{6} + \frac{1}{6}$</p> <p>Choose the most efficient method in any given situation</p>	<p>Add numbers with only 2 digits which are not zeros e.g. $3.4 + 5.8$</p> <p>Derive swiftly and without any difficulty number bonds to 100</p> <p>Add 'friendly' large numbers using knowledge of place value and number facts</p> <p>Use expanded column addition to add pairs of 4- and 5-digit numbers</p>

	<p>more 'friendly' numbers, including money and decimals</p> <p>e.g. $3 + 8 + 6 + 4 + 7$</p> <p>e.g. $0.6 + 0.7 + 0.4$</p> <p>e.g. $2056 + 44$</p>		
<p>Y5</p> <p>–</p>	<p>Subtract numbers with 2 significant digits only, using mental strategies</p> <p>e.g. $6.2 - 4.5$</p> <p>e.g. $72\ 000 - 47\ 000$</p> <p>Subtract 1- or 2-digit multiples of 10, 100, 1000, 10 000 and 100 000</p> <p>e.g. $8000 - 3000$</p> <p>e.g. $60\ 000 - 200\ 000$</p> <p>Subtract 1- or 2-digit near multiples of 10, 100, 1000, 10 000 and 100 000 from other numbers</p> <p>e.g. $82\ 472 - 30\ 004$</p> <p>Subtract decimal numbers which are near multiples of 1 or 10, including money</p> <p>e.g. $6.34 - 1.99$</p> <p>e.g. $£34.59 - £19.95$</p> <p>Use counting up subtraction, with knowledge of number bonds to 10, 100 or £1, as a strategy to perform mental subtraction</p> <p>e.g. $£10 - £3.45$</p> <p>e.g. $1000 - 782$</p> <p>Recognise fraction complements to 1 and to the next whole number</p> <p>e.g. $1\frac{2}{5} + \frac{3}{5} = 2$</p>	<p>Use compact or expanded column subtraction to subtract numbers with up to 5 digits</p> <p>Use complementary addition for subtractions where the larger number is a multiple or near multiple of 1000</p> <p>Use complementary addition for subtractions of decimal numbers with up to 2 places, including amounts of money</p> <p>Begin to subtract related fractions using equivalences</p> <p>e.g. $\frac{1}{2} - \frac{1}{6} = \frac{2}{6}$</p> <p>Choose the most efficient method in any given situation</p>	<p>Derive swiftly and without difficulty number bonds to 100</p> <p>Use counting up with confidence to solve most subtractions, including finding complements to multiples of 1000</p> <p>e.g. $3000 - 2387$</p>
<p>Y5</p> <p>×</p>	<p>Know by heart all the multiplication facts up to 12×12</p> <p>Multiply whole numbers and 1- and 2-place decimals by 10, 100, 1000, 10 000</p> <p>Use knowledge of factors and multiples in multiplication</p>	<p>Use short multiplication to multiply a 1-digit number by a number with up to 4 digits</p> <p>Use long multiplication to multiply 3-digit and 4-digit numbers by a number between 11 and 20</p> <p>Choose the most efficient method in any given situation</p>	<p>Know multiplication tables to 11×11</p> <p>Multiply whole numbers and 1-place decimals by 10, 100 and 1000</p> <p>Use knowledge of factors as aids to mental multiplication</p> <p>e.g. 13×6 is double 13×3</p>

	<p>e.g. 43×6 is double 43×3 e.g. 28×50 is $\frac{1}{2}$ of $28 \times 100 = 1400$ Use knowledge of place value and rounding in mental multiplication e.g. 67×199 as $67 \times 200 - 67$ Use doubling and halving as a strategy in mental multiplication e.g. 58×5 is half of 58×10 e.g. 34×4 is 34 doubled twice Partition 2-digit numbers, including decimals, to multiply by a 1-digit number mentally e.g. 6×27 as 6×20 (120) plus 6×7 (42) e.g. 6.3×7 as 6×7 (42) plus 0.3×7 (2.1) Double amounts of money by partitioning e.g. £37.45 doubled is £37 doubled (£74) plus 45p doubled (90p) giving a total of £74.90</p>	<p>Find simple percentages of amounts e.g. 10%, 5%, 20%, 15% and 50% Begin to multiply fractions and mixed numbers by whole numbers ≤ 10 e.g. $4 \times \frac{2}{3} = \frac{8}{3} = 2 \frac{2}{3}$</p>	<p>e.g. 23×5 is $\frac{1}{2}$ of 23×10 Use the grid method to multiply numbers with up to 4 digits by 1-digit numbers Use the grid method to multiply 2-digit numbers by 2-digit numbers</p>
<p>Y5 <div style="text-align: center;">÷</div></p>	<p>Know by heart all the division facts up to $144 \div 12$ Divide whole numbers by 10, 100, 1000, 10 000 to give whole number answers or answers with 1, 2 or 3 decimal places Use doubling and halving as mental division strategies e.g. $34 \div 5$ is $(34 \div 10) \times 2$ Use knowledge of multiples and factors, as well as tests for divisibility, in mental division e.g. $246 \div 6$ is $123 \div 3$ e.g. We know that 525 divides by 25 and by 3 Halve amounts of money by partitioning e.g. $\frac{1}{2}$ of £75.40 = $\frac{1}{2}$ of £75 (£37.50) plus half of 40p (20p) which is £37.70 Divide larger numbers mentally by subtracting the 10th or 100th multiple as appropriate</p>	<p>Use short division to divide a number with up to 4 digits by a number ≤ 12 Give remainders as whole numbers or as fractions Find non-unit fractions of large amounts Turn improper fractions into mixed numbers and vice versa Choose the most efficient method in any given situation</p>	<p>Know by heart division facts up to $121 \div 11$ Divide whole numbers by 10, 100 or 1000 to give answers with up to 1 decimal place Use doubling and halving as mental division strategies Use an efficient written method to divide numbers ≤ 1000 by 1-digit numbers Find unit fractions of 2- and 3-digit numbers</p>

	<p>e.g. $96 \div 6$ is $10 + 6$, as $10 \times 6 = 60$ and $6 \times 6 = 36$</p> <p>e.g. $312 \div 3$ is $100 + 4$ as $100 \times 3 = 300$ and $4 \times 3 = 12$</p> <p>Know tests for divisibility by 2, 3, 4, 5, 6, 9 and 25</p> <p>Know square numbers and cube numbers</p> <p>Reduce fractions to their simplest form</p>		
Year 6			
	Mental calculation	Written calculation	Default for ALL children
Y6 +	<p>Know by heart number bonds to 100 and use these to derive related facts</p> <p>e.g. $3.46 + 0.54$</p> <p>Derive, quickly and without difficulty, number bonds to 1000</p> <p>Add small and large whole numbers where the use of place value or number facts makes the calculation do-able mentally</p> <p>e.g. $34\ 000 + 8000$</p> <p>Add multiples of powers of 10 and near multiples of the same</p> <p>e.g. $6345 + 199$</p> <p>Add negative numbers in a context such as temperature where the numbers make sense</p> <p>Add two 1-place decimal numbers or two 2-place decimal numbers less than 1</p> <p>e.g. $4.5 + 6.3$</p> <p>e.g. $0.74 + 0.33$</p> <p>Add positive numbers to negative numbers</p> <p>e.g. <i>Calculate a rise in temperature or continue a sequence beginning with a negative number</i></p>	<p>Use column addition to add numbers with up to 5 digits</p> <p>Use column addition to add decimal numbers with up to 3 decimal places</p> <p>Add mixed numbers and fractions with different denominators</p>	<p>Derive, swiftly and without difficulty, number bonds to 100</p> <p>Use place value and number facts to add 'friendly' large or decimal numbers</p> <p>e.g. $3.4 + 6.6$</p> <p>e.g. $26\ 000 + 54\ 000$</p> <p>Use column addition to add numbers with up to 4-digits</p> <p>Use column addition to add pairs of 2-place decimal numbers</p>
Y6 -	<p>Use number bonds to 100 to perform mental subtraction of any pair of integers by complementary addition</p>	<p>Use column subtraction to subtract numbers with up to 6 digits</p> <p>Use complementary addition for subtractions</p>	<p>Use number bonds to 100 to perform mental subtraction of numbers up to 1000 by complementary addition</p>

	<p>e.g. $1000 - 654$ as $46 + 300$ in our heads</p> <p>Use number bonds to 1 and 10 to perform mental subtraction of any pair of 1-place or 2-place decimal numbers using complementary addition and including money</p> <p>e.g. $10 - 3.65$ as $0.35 + 6$</p> <p>e.g. $£50 - £34.29$ as $71p + £15$</p> <p>Use number facts and place value to perform mental subtraction of large numbers or decimal numbers with up to 2 places</p> <p>e.g. $467\,900 - 3005$</p> <p>e.g. $4.63 - 1.02$</p> <p>Subtract multiples of powers of 10 and near multiples of the same</p> <p>Subtract negative numbers in a context such as temperature where the numbers make sense</p>	<p>where the larger number is a multiple or near multiple of 1000 or 10 000</p> <p>Use complementary addition for subtractions of decimal numbers with up to 3 places, including money</p> <p>Subtract mixed numbers and fractions with different denominators</p>	<p>e.g. $1000 - 654$ as $46 + 300$ in our heads</p> <p>Use complementary addition for subtraction of integers up to 10 000</p> <p>e.g. $2504 - 1878$</p> <p>Use complementary addition for subtractions of 1-place decimal numbers and amounts of money</p> <p>e.g. $£7.30 - £3.55$</p>
<p>Y6</p> <p>×</p>	<p>Know by heart all the multiplication facts up to 12×12</p> <p>Multiply whole numbers and decimals with up to 3 places by 10, 100 or 1000</p> <p>e.g. $234 \times 1000 = 234\,000$</p> <p>e.g. $0.23 \times 1000 = 230$</p> <p>Identify common factors, common multiples and prime numbers and use factors in mental multiplication</p> <p>e.g. 326×6 is 652×3 which is 1956</p> <p>Use place value and number facts in mental multiplication</p> <p>e.g. $4000 \times 6 = 24\,000$</p> <p>e.g. $0.03 \times 6 = 0.18$</p> <p>Use doubling and halving as mental multiplication strategies, including to multiply by 2, 4, 8, 5, 20, 50 and 25</p> <p>e.g. 28×25 is a quarter of $28 \times 100 = 700$</p> <p>Use rounding in mental multiplication</p>	<p>Use short multiplication to multiply a 1-digit number by a number with up to 4 digits</p> <p>Use long multiplication to multiply a 2-digit number by a number with up to 4 digits</p> <p>Use short multiplication to multiply a 1-digit number by a number with 1 or 2 decimal places, including amounts of money</p> <p>Multiply fractions and mixed numbers by whole numbers</p> <p>Multiply fractions by proper fractions</p> <p>Use percentages for comparison and calculate simple percentages</p>	<p>Know by heart all the multiplication facts up to 12×12</p> <p>Multiply whole numbers and 1- and 2-place decimals by 10, 100 and 1000</p> <p>Use an efficient written method to multiply a 1-digit or a teen number by a number with up to 4 digits by partitioning (grid method)</p> <p>Multiply a 1-place decimal number up to 10 by a number ≤ 100 using the grid method</p>

	<p>e.g. 34×19 as $(34 \times 20) - 34$</p> <p>Multiply 1- and 2-place decimals by numbers up to and including 10 using place value and partitioning</p> <p>e.g. 3.6×4 is $12 + 2.4$</p> <p>e.g. 2.53×3 is $6 + 1.5 + 0.09$</p> <p>Double decimal numbers with up to 2 places using partitioning</p> <p>e.g. 36.73 doubled is double 36 (72) plus double 0.73 (1.46)</p>		
<p>Y6</p> <p>÷</p>	<p>Know by heart all the division facts up to $144 \div 12$</p> <p>Divide whole numbers by powers of 10 to give whole number answers or answers with up to 3 decimal places</p> <p>Identify common factors, common multiples and primes numbers and use factors in mental division</p> <p>e.g. $438 \div 6$ is $219 \div 3$ which is 73</p> <p>Use tests for divisibility to aid mental calculation</p> <p>Use doubling and halving as mental division strategies, for example to divide by 2, 4, 8, 5, 20 and 25</p> <p>e.g. $628 \div 8$ is halved three times: 314, 157, 78.5</p> <p>Divide 1- and 2-place decimals by numbers up to and including 10 using place value</p> <p>e.g. $2.4 \div 6 = 0.4$</p> <p>e.g. $0.65 \div 5 = 0.13$</p> <p>e.g. $£6.33 \div 3 = £2.11$</p> <p>Halve decimal numbers with up to 2 places using partitioning</p> <p>e.g. Half of 36.86 is half of 36 (18) plus half of 0.86 (0.43)</p> <p>Know and use equivalence between simple</p>	<p>Use short division to divide a number with up to 4 digits by a 1-digit or a 2-digit number</p> <p>Use long division to divide 3-digit and 4-digit numbers by 'friendly' 2-digit numbers</p> <p>Give remainders as whole numbers or as fractions or as decimals</p> <p>Divide a 1-place or a 2-place decimal number by a number ≤ 12 using multiples of the divisors</p> <p>Divide proper fractions by whole numbers</p>	<p>Know by heart all the division facts up to $144 \div 12$</p> <p>Divide whole numbers by 10, 100, 1000 to give whole number answers or answers with up to 2 decimal places</p> <p>Use an efficient written method, involving subtracting powers of 10 times the divisor, to divide any number of up to 1000 by a number ≤ 12</p> <p>e.g. $836 \div 11$ as $836 - 770 (70 \times 11)$ leaving 66 which is 6×11, giving the answer 76</p> <p>Divide a 1-place decimal by a number ≤ 10 using place value and knowledge of division facts</p>

	fractions, decimals and percentages, including in different contexts Recognise a given ratio and reduce a given ratio to its lowest terms		
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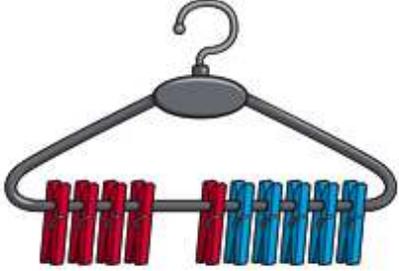
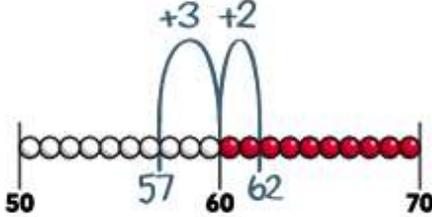
Overview of Strategies and Methods – Addition

	Year 1	Year 2									
Mental Addition	<p>Using place value Count in 1s e.g. $45 + 1$ Count in 10s e.g. $45 + 10$ without counting on in 1s</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>34</td> <td>35</td> <td>36</td> </tr> <tr> <td>44</td> <td></td> <td>46</td> </tr> <tr> <td>54</td> <td>55</td> <td>56</td> </tr> </table> <p>Add 10 to any given 2-digit number</p> <p>Counting on Count on in 1s e.g. $8 + 3$ as 8, 9, 10, 11</p> <div style="text-align: center;"> </div> <p>Add, putting the larger number first Count on in 10s e.g. $45 + 20$ as 45, 55, 65</p>	34	35	36	44		46	54	55	56	<p>Using place value Know 1 more or 10 more than any number e.g. 1 more than 67 e.g. 10 more than 85 Partitioning e.g. $55 + 37$ as $50 + 30$ and $5 + 7$, then finally combine the two totals: $80 + 12$</p> <div style="text-align: center;"> </div> <p>Counting on Add 10 and multiples of 10 to a given 1- or 2-digit number e.g. $76 + 20$ as 76, 86, 96 or in one hop: $76 + 20 = 96$ Add two 2-digit numbers by counting on in 10s, then in 1s e.g. $55 + 37$ as $55 + 30$ (85) + 7 = 92</p> <div style="text-align: center;"> </div> <p>Add near multiples of 10 e.g. $46 + 19$ e.g. $63 + 21$</p>
	34	35	36								
44		46									
54	55	56									

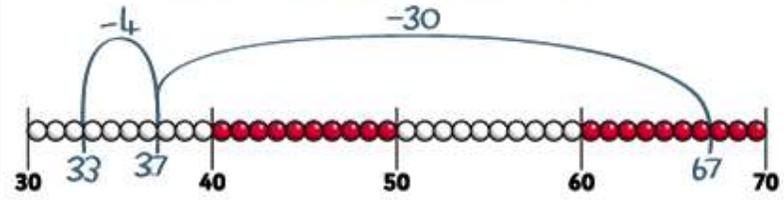
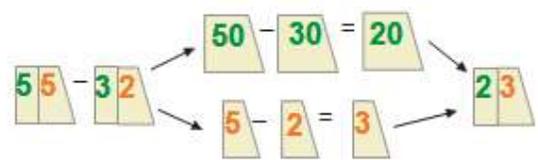


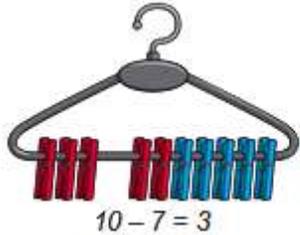
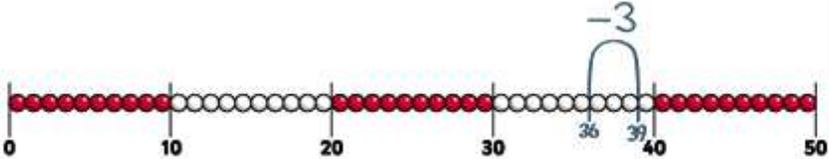
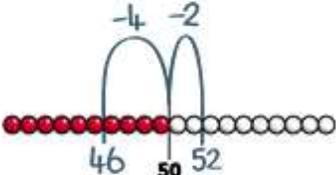
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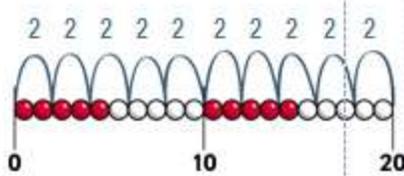
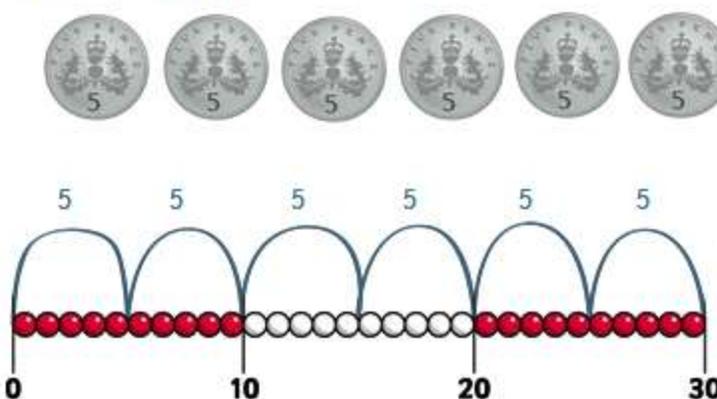
Overview of Strategies and Methods – Addition

	Year 1	Year 2
Mental Addition	<p>Using number facts 'Story' of 4, 5, 6, 7, 8 and 9 e.g. $7 = 7 + 0$, $6 + 1$, $5 + 2$, $4 + 3$ Number bonds to 10 e.g. $5 + 5$, $6 + 2$, $7 + 3$, $8 + 2$, $9 + 1$, $10 + 0$</p>  <p style="text-align: center;">$4 + 6 = 10$</p> <p>Use patterns based on known facts when adding e.g. $4 + 3 = 7$ so we know $24 + 3$, $44 + 3$, $74 + 3$</p>	<p>Using number facts Know pairs of numbers which make the numbers up to and including 12 e.g. $8 = 4 + 4$, $3 + 5$, $2 + 6$, $1 + 7$, $0 + 8$ e.g. $10 = 5 + 5$, $4 + 6$, $3 + 7$, $2 + 8$, $1 + 9$, $0 + 10$ Use patterns based on known facts when adding e.g. $6 + 3 = 9$, so we know $36 + 3 = 39$, $66 + 3 = 69$, $56 + 3 = 59$</p>  <p>Bridging 10 e.g. $57 + 5 = 57 + 3 (60) + 2 = 62$</p>  <p>Add three or more 1-digit numbers, spotting bonds to 10 or doubles e.g. $3 + 5 + 3 = 6 + 5 = 11$ e.g. $8 + 2 + 4 = 10 + 4 = 14$</p>

	Year 1	Year 2									
Mental Subtraction	<p>Using place value Count back in 1s e.g. <i>Know 53 – 1</i> Count back in 10s e.g. <i>Know 53 – 10 without counting back in 1s</i></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>32</td> <td>33</td> <td>34</td> </tr> <tr> <td>42</td> <td>43</td> <td>44</td> </tr> <tr> <td>52</td> <td>53</td> <td>54</td> </tr> </table>	32	33	34	42	43	44	52	53	54	<p>Using place value Know 1 less or 10 less than any number e.g. <i>1 less than 74</i> e.g. <i>10 less than 82</i> Partitioning e.g. <i>55 – 32 as 50 – 30 and 5 – 2 and combine the answers: 20 + 3</i></p>
	32	33	34								
	42	43	44								
	52	53	54								
<p>Taking away Count back in 1s e.g. <i>11 – 3 as 11, 10, 9, 8</i> e.g. <i>14 – 3 as 14, 13, 12, 11</i></p>	<p>Taking away Subtract 10 and multiples of 10 e.g. <i>76 – 20 as 76, 66, 56 or in one hop: 76 – 20 = 56</i> Subtract two 2-digit numbers by counting back in 10s, then in 1s e.g. <i>67 – 34 as 67 subtract 30 (37) then count back 4 (33)</i></p>										
<p>Count back in 10s e.g. <i>53 – 20 as 53, 43, 33</i></p>	<p>Subtract near multiples of 10 e.g. <i>74 – 21</i> e.g. <i>57 – 19</i></p>										



	Year 1	Year 2
Mental Subtraction	<p>Using number facts 'Story' of 4, 5, 6, 7, 8 and 9 e.g. 'Story' of 7 is $7 - 1 = 6$, $7 - 2 = 5$, $7 - 3 = 4$ Number bonds to 10 e.g. $10 - 1 = 9$, $10 - 2 = 8$, $10 - 3 = 7$</p>  <p style="text-align: center;">$10 - 7 = 3$</p> <p>Subtract using patterns of known facts e.g. $7 - 3 = 4$ so we know $27 - 3 = 24$, $47 - 3 = 44$, $77 - 3 = 74$</p>	<p>Using number facts Know pairs of numbers which make the numbers up to and including 12 and derive related subtraction facts e.g. $10 - 6 = 4$, $8 - 3 = 5$, $5 - 2 = 3$ Subtract using patterns of known facts e.g. $9 - 3 = 6$, so we know $39 - 3 = 36$, $69 - 3 = 66$, $89 - 3 = 86$</p>  <p>Bridging 10 e.g. $52 - 6$ as $52 - 2 (50) - 4 = 46$</p>  <p>Counting up Find a difference between two numbers on a line where the numbers are close together e.g. $51 - 47$</p>

	Year 1	Year 2																																																																																																			
Mental Multiplication	<p>Counting in steps ('clever' counting) Count in 2s</p> 	<p>Counting in steps ('clever' counting) Count in 2s, 5s and 10s</p> 																																																																																																			
	<p>Count in 10s</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td style="background-color: #d8bfd8;">10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td style="background-color: #d8bfd8;">20</td></tr> <tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td style="background-color: #d8bfd8;">30</td></tr> <tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td style="background-color: #d8bfd8;">40</td></tr> <tr><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td style="background-color: #d8bfd8;">50</td></tr> <tr><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td><td>59</td><td style="background-color: #d8bfd8;">60</td></tr> <tr><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td style="background-color: #d8bfd8;">70</td></tr> <tr><td>71</td><td>72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td style="background-color: #d8bfd8;">80</td></tr> <tr><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td><td>87</td><td>88</td><td>89</td><td style="background-color: #d8bfd8;">90</td></tr> <tr><td>91</td><td>92</td><td>93</td><td>94</td><td>95</td><td>96</td><td>97</td><td>98</td><td>99</td><td style="background-color: #d8bfd8;">100</td></tr> </table>	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
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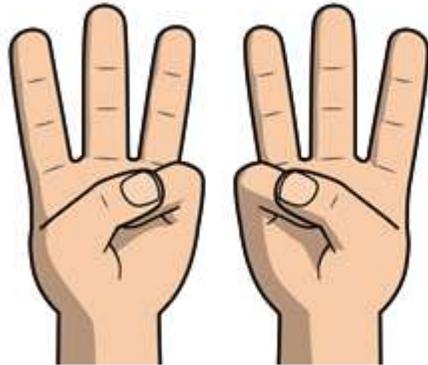


Mental Multiplication

Year 1

Doubling and halving

Find doubles to double 5 using fingers
e.g. double 3



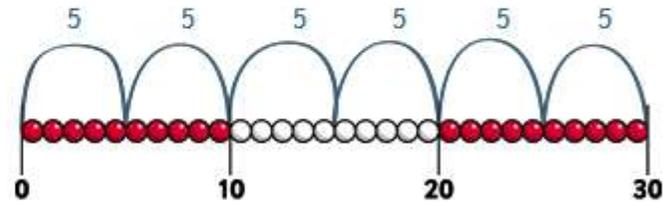
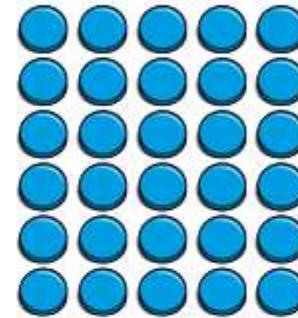
Year 2

Grouping

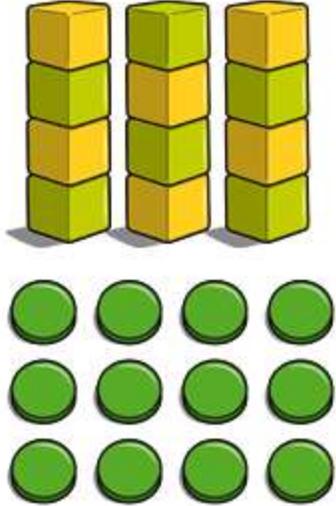
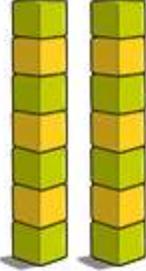
Use arrays to find answers to multiplication and relate to 'clever' counting

e.g. 3×4 as three lots of four things

e.g. 6×5 as six steps in the 5s count as well as six lots of five



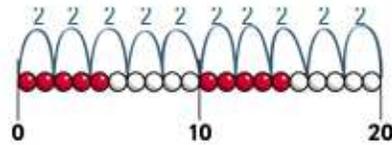
Understand that 5×3 can be worked out as three 5s or five 3s

Mental Multiplication	Year 1	Year 2
	<p>Grouping Begin to use visual and concrete arrays and sets of objects to find the answers to 'three lots of four' or 'two lots of five' e.g. <i>three lots of four</i></p> 	<p>Using number facts Know doubles to double 20 e.g. <i>double 7 is 14</i></p>  <p>Start learning $\times 2$, $\times 5$, $\times 10$ tables, relating these to 'clever' counting in 2s, 5s, and 10s e.g. $5 \times 10 = 50$, and five steps in the 10s count = 10, 20, 30, 40, 50</p> 

Year 1

Counting in steps ('clever' counting)

Count in 2s

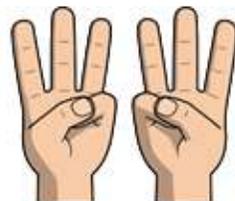


Count in 10s

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

Doubling and halving

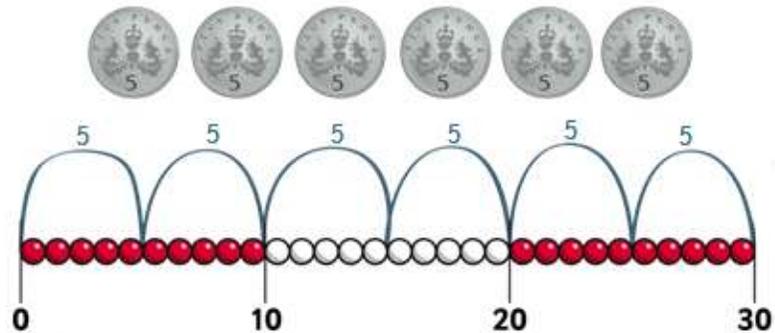
Find half of even numbers up to 12, including realising that it is hard to halve an odd number



Year 2

Counting in steps ('clever' counting)

Count in 2s, 5s and 10s

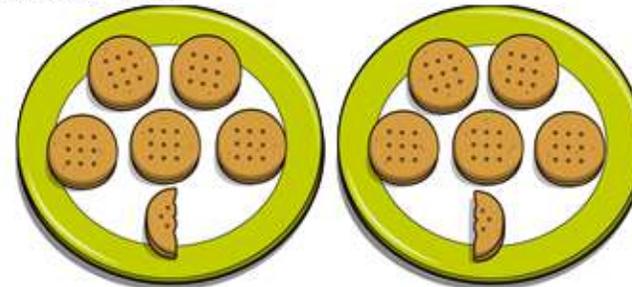


Begin to count in 3s

Doubling and halving

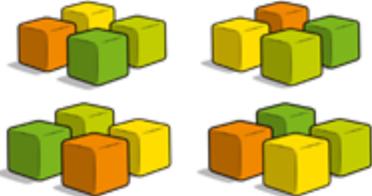
Find half of numbers up to 40, including realising that half of an odd number gives a remainder of 1 or an answer containing a 1/2

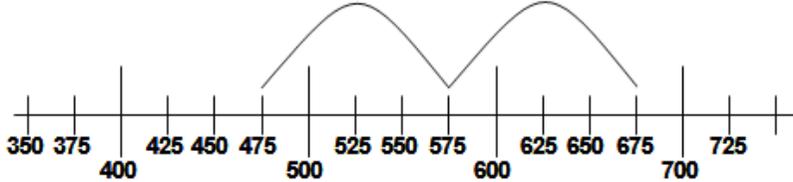
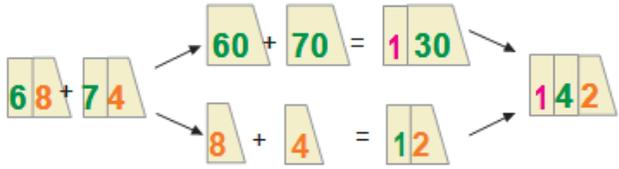
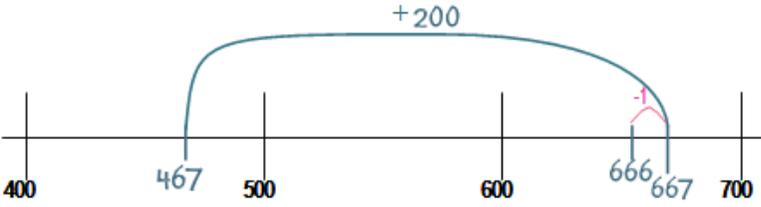
e.g. $1/2$ of 11 = 5 $1/2$



Begin to know half of multiples of 10 to 100

e.g. half of 70 is 35

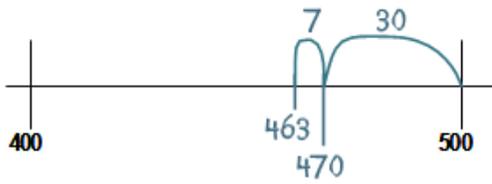
	Year 1	Year 2								
Mental Division	<p>Grouping Begin to use visual and concrete arrays and 'sets of' objects to find the answers to questions such as 'How many towers of three can I make with twelve cubes?'</p> <p>Sharing Begin to find half of a quantity using sharing e.g. find half of 16 cubes by giving one each repeatedly to two children</p>	<p>Grouping Relate division to multiplication by using arrays or towers of cubes to find answers to division e.g. 'How many towers of five cubes can I make from twenty cubes?' as $_ \times 5 = 20$ and also as $20 \div 5 = _$</p>  <p>Relate division to 'clever' counting and hence to multiplication e.g. 'How many fives do I count to get to twenty?'</p> <p>Sharing Begin to find half or a quarter of a quantity using sharing e.g. find a quarter of 16 cubes by sorting the cubes into four piles</p>  <p>Find $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ of small quantities</p> <table border="1" data-bbox="1252 991 1863 1094"> <tr> <td colspan="2">$\frac{1}{2}$</td> <td colspan="2">$\frac{1}{2}$</td> </tr> <tr> <td>$\frac{1}{4}$</td> <td>$\frac{1}{4}$</td> <td>$\frac{1}{4}$</td> <td>$\frac{1}{4}$</td> </tr> </table> <p>Using number facts Know half of even numbers to 24 Know $\times 2$, $\times 5$ and $\times 10$ division facts Begin to know $\times 3$ division facts</p>	$\frac{1}{2}$		$\frac{1}{2}$		$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
$\frac{1}{2}$		$\frac{1}{2}$								
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$							

	Year 3	Year 4
Mental Addition	<p>Using place value Count in 100s e.g. Know $475 + 200$ as 475, 575, 675</p>  <p>Add multiples of 10, 100 and £1 e.g. $746 + 200$ e.g. $746 + 40$ e.g. $£6.34 + £5$ as $£6 + £5$ and 34p</p> <p>Partitioning e.g. $£8.50 + £3.70$ as $£8 + £3$ and $50p + 70p$ and combine the totals: $£11 + £1.20$ e.g. $347 + 36$ as $300 + 40 + 30$ and $7 + 6$ and combine the totals: $370 + 13 = 383$ e.g. $68 + 74$ as $60 + 70$ and $8 + 4$ and combine the totals: $130 + 12 = 142$</p> 	<p>Using place value Count in 1000s e.g. Know $3475 + 2000$ as 3475, 4475, 5475</p> <p>Partitioning e.g. $746 + 40$ e.g. $746 + 203$ as $700 + 200$ and 40 and $6 + 3$ e.g. $134 + 707$ as $100 + 700$ and 30 and $4 + 7$</p> <p>Counting on Add 2-digit numbers to 2-, 3- and 4-digit numbers by adding the multiple of 10 then the 1s e.g. $167 + 55$ as $167 + 50$ (217) + 5 = 222</p> <p>Add near multiples of 10, 100 and 1000 e.g. $467 + 199$ e.g. $3462 + 2999$</p>  <p>Count on to add 3-digit numbers and money e.g. $463 + 124$ as $463 + 100$ (563) + 20 (583) + 4 = 587 e.g. $£4.67 + £5.30$ as $£9.67 + 30p$</p>



Overview of Strategies and Methods – Addition



	Year 3	Year 4
Mental Addition	<p>Counting on Add two 2-digit numbers by adding the multiple of 10, then the 1s e.g. $67 + 55$ as $67 + 50$ (117) + 5 = 122 Add near multiples of 10 and 100 e.g. $67 + 39$ e.g. $364 + 199$ Add pairs of 'friendly' 3-digit numbers e.g. $548 + 120$ Count on from 3-digit numbers e.g. $247 + 34$ as $247 + 30$ (277) + 4 = 281</p>	<p>Using number facts Number bonds to 100 and to the next multiple of 100 e.g. $288 + 12 = 300$ e.g. $1353 + 47 = 1400$ e.g. $463 + 37 = 500$</p>
	<p>Using number facts Know pairs which total each number to 20 e.g. $7 + 8 = 15$ e.g. $12 + 6 = 18$ Number bonds to 100 e.g. $35 + 65$ e.g. $46 + 54$ e.g. $73 + 27$</p> <hr style="border: 1px dotted black;"/> <p>Add to the next 10 and the next 100 e.g. $176 + 4 = 180$ e.g. $435 + 65 = 500$</p>	 <p>Number bonds to £1 and to the next whole pound e.g. $63p + 37p = £1$ e.g. $£3.45 + 55p = £4$ Add to the next whole number e.g. $4.6 + 0.4$ e.g. $7.2 + 0.8$</p>

	Year 3	Year 4
Written Addition	<p>Build on partitioning to develop expanded column addition with two 3-digit numbers e.g. 466 + 358</p> $\begin{array}{r} 400 & 60 & 6 \\ + & 300 & 50 & 8 \\ \hline 700 & 110 & 14 & = 824 \end{array}$	<p>Build on expanded column addition to develop compact column addition with larger numbers e.g. 1466 + 4868</p> $\begin{array}{r} 1000 & 400 & 60 & 6 \\ 4000 & 800 & 60 & 8 \\ + & 1000 & 100 & 10 \\ \hline 6000 & 300 & 30 & 4 \end{array}$
	<p>Use expanded column addition where digits in a column add to more than the column value e.g. 466 + 358</p> $\begin{array}{r} 400 & 60 & 6 \\ 300 & 50 & 8 \\ + & 100 & 10 \\ \hline 800 & 20 & 4 \end{array}$	<p>Compact column addition with larger numbers e.g. 5347 + 2286 + 1495</p> $\begin{array}{r} 5347 \\ 2286 \\ + 1495 \\ \hline 9128 \end{array}$
	<p>Compact column addition with two or more 3-digit numbers or towers of 2-digit numbers e.g. 347 + 286 + 495</p> $\begin{array}{r} 347 \\ 286 \\ + 495 \\ 21 \\ \hline 1128 \end{array}$	<p>Use expanded and compact column addition to add amounts of money Add like fractions - - - e.g. 3/8 + 1/8 + 1/8</p>
	<p>Compact column addition with 3- and 4-digit numbers Recognise like fractions that add to 1 - - e.g. 1/4 + 3/4 - - e.g. 3/5 + 2/5</p>	



Overview of Strategies and Methods – Addition

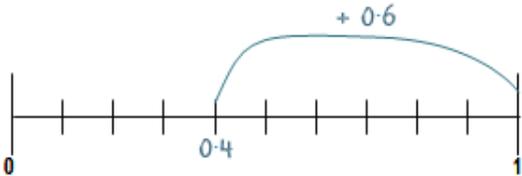
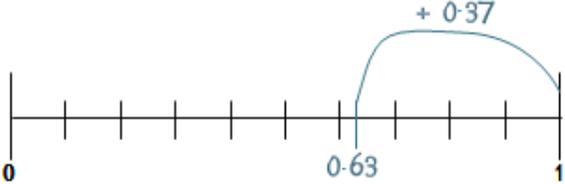


	Year 5	Year 6																																																																																																				
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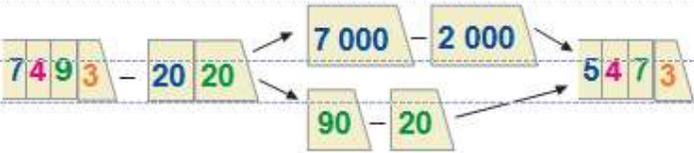
	Year 5	Year 6
Mental Addition	<p>Counting on Add two decimal numbers by adding the 1s, then the 0.1s/0.01s e.g. $5.72 + 3.05$ as $5.72 + 3 (8.72) + 0.05 = 8.77$ Add near multiples of 1 e.g. $6.34 + 0.99$ e.g. $5.63 + 0.9$ Count on from large numbers e.g. $6834 + 3005$ as $9834 + 5$</p> <p>Using number facts Number bonds to 1 and to the next whole number e.g. $5.7 + 0.3$ e.g. $0.4 + 0.6$</p>  <p>A number line from 0 to 1 with 10 equal intervals. A tick mark is labeled 0.4. A blue arc starts at 0.4 and ends at 1.0, with '+ 0.6' written above it.</p> <p>Add to the next 10 from a decimal number e.g. $7.8 + 2.2 = 10$</p>	<p>Using number facts Number bonds to 1 and to the next multiple of 1 e.g. $0.63 + 0.37$ e.g. $2.355 + 0.645$</p>  <p>A number line from 0 to 1 with 10 equal intervals. A tick mark is labeled 0.63. A blue arc starts at 0.63 and ends at 1.0, with '+ 0.37' written above it.</p> <p>Add to the next 10 e.g. $4.62 + 5.38$</p>



Overview of Strategies and Methods – Addition



	Year 5	Year 6
Written Addition	<p>Expanded column addition for money leading to compact column addition for adding several amounts of money e.g. £14.64 + £28.78 + £12.26</p> $ \begin{array}{r} \text{£}14 \text{ 60p 4p} \\ \text{£}28 \text{ 70p 8p} \\ + \text{£}12 \text{ 20p 6p} \\ \text{£}1 \text{ 10p} \\ \hline \text{£}55 \text{ 60p 8p} \end{array} $	<p>Compact column addition for adding several large numbers and decimal numbers with up to 2 decimal places Compact column addition with money e.g. £14.64 + £28.78 + £12.26</p> $ \begin{array}{r} \text{£}14.64 \\ + \text{£}28.78 \\ \text{£}12.26 \\ \hline \text{£}55.68 \end{array} $
	<p>Compact column addition to add pairs of 5-digit numbers Continue to use column addition to add towers of several larger numbers Use compact addition to add decimal numbers with up to 2 decimal places e.g. 15.68 + 27.86</p> $ \begin{array}{r} 15.68 \\ + 27.86 \\ \hline 43.54 \end{array} $ <p>Add related fractions - - - e.g. $\frac{3}{4} + \frac{1}{8} = \frac{7}{8}$</p>	<p>Add unlike fractions, including mixed numbers - - - e.g. $\frac{1}{4} + \frac{2}{3} = \frac{11}{12}$ - - - e.g. $2 \frac{1}{4} + 1 \frac{1}{3} = 3 \frac{7}{12}$</p>

Mental Subtraction	Year 3	Year 4
	<p>Taking away Use place value to subtract e.g. $348 - 300$ e.g. $348 - 40$ e.g. $348 - 8$</p>  <p>Take away multiples of 10, 100 and £1 e.g. $476 - 40 = 436$ e.g. $476 - 300 = 176$ e.g. $£4.76 - £2 = £2.76$</p> <p>Partitioning e.g. $68 - 42$ as $60 - 40$ and $8 - 2$ e.g. $£6.84 - £2.40$ as $£6 - £2$ and $80p - 40p$</p> 	<p>Taking away Use place value to subtract e.g. $4748 - 4000$</p>  <p>Take away multiples of 10, 100, 1000, £1, 10p or 0.1 e.g. $8392 - 50$ e.g. $6723 - 3000$ e.g. $£3.74 - 30p$ e.g. $5.6 - 0.2$</p> <p>Partitioning e.g. $£5.87 - £3.04$ as $£5 - £3$ and $7p - 4p$ e.g. $7493 - 2020$ as $7000 - 2000$ and $90 - 20$</p>  <p>Count back e.g. $6482 - 1301$ as $6482 - 1000 (5482) - 300 (5182) - 1 = 5181$</p> <p>Subtract near multiples of 10, 100, 1000 or £1 e.g. $3522 - 1999$ e.g. $£34.86 - £19.99$</p>

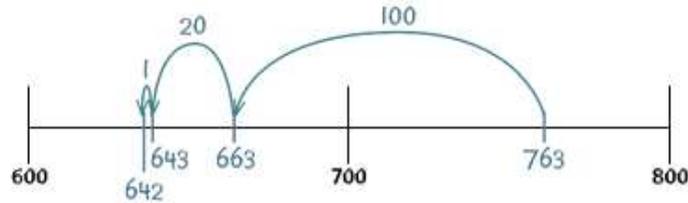


Mental Subtraction

Year 3

Count back in 100s, 10s then 1s

e.g. $763 - 121$ as $763 - 100$ (663) $- 20$ (643) $- 1 = 642$



Subtract near multiples of 10 and 100

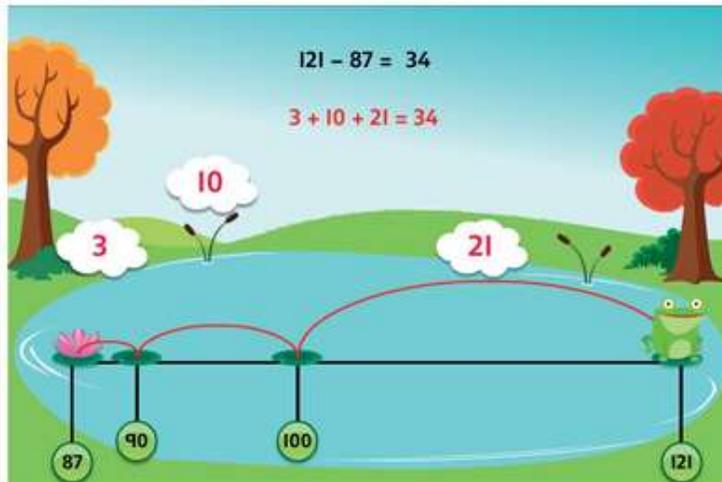
e.g. $648 - 199$

e.g. $86 - 39$

Counting up

Find a difference between two numbers by counting up from the smaller to the larger

e.g. $121 - 87$



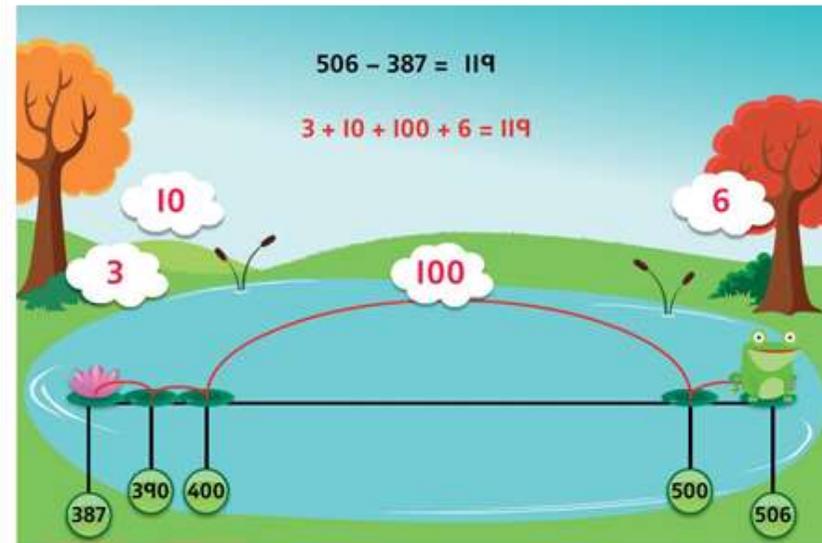
Year 4

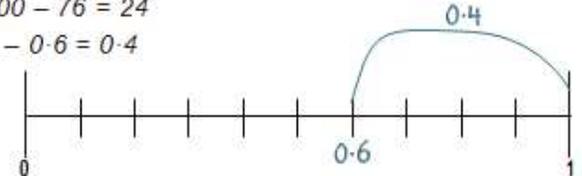
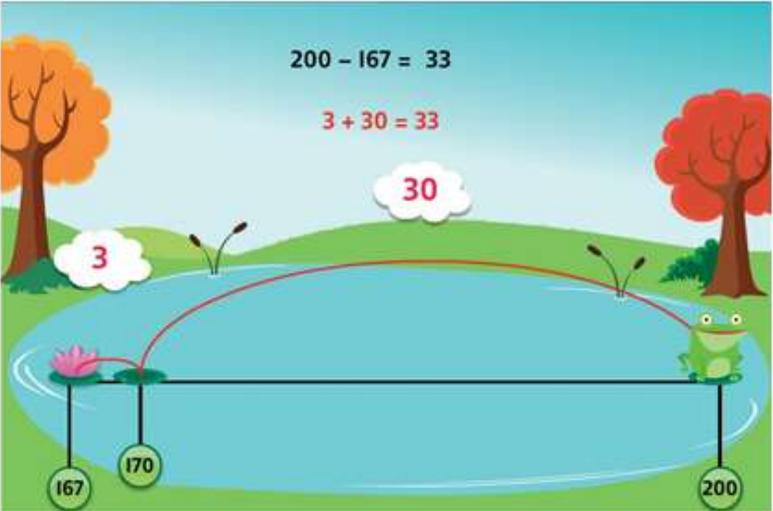
Counting up

Find a difference between two numbers by counting up from the smaller to the larger

e.g. $506 - 387$

e.g. $4000 - 2693$



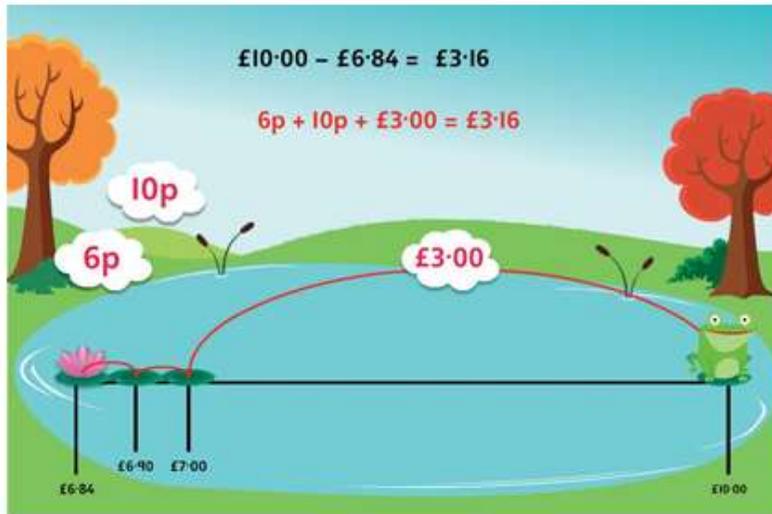
	Year 3	Year 4
Mental Subtraction	<p>Using number facts Know pairs which total each number to 20 e.g. $20 - 14 = 6$ Number bonds to 100 e.g. $100 - 48 = 52$ e.g. $100 - 35 = 65$</p>  <p>Subtract using number facts to bridge back through a 10 e.g. $42 - 5 = 42 - 2 (40) - 3 = 37$</p>	<p>Using number facts Number bonds to 10 and 100 and derived facts e.g. $100 - 76 = 24$ e.g. $1 - 0.6 = 0.4$</p>  <p>Number bonds to £1 and £10 e.g. $£1.00 - 86p = 14p$ e.g. $£10.00 - £3.40 = £6.60$</p>
Written Subtraction	<p>Develop counting up subtraction e.g. $200 - 167$</p> 	<p>Expanded column subtraction with 3- and 4-digit numbers e.g. $726 - 358$</p> $ \begin{array}{r} 600 \quad 110 \quad 16 \\ \cancel{700} \quad \cancel{20} \quad \cancel{8} \\ - 300 \quad 50 \quad 8 \\ \hline 300 \quad 60 \quad 8 \end{array} $ <p>Begin to develop compact column subtraction e.g. $726 - 358$</p> $ \begin{array}{r} 6 \quad 11 \quad 16 \\ \cancel{7} \quad \cancel{2} \quad \cancel{8} \\ - 3 \quad 5 \quad 8 \\ \hline 3 \quad 6 \quad 8 \end{array} $



Written Subtraction

Year 3

Use counting up subtraction to find change from £1, £5 and £10
e.g. £10.00 – £6.84



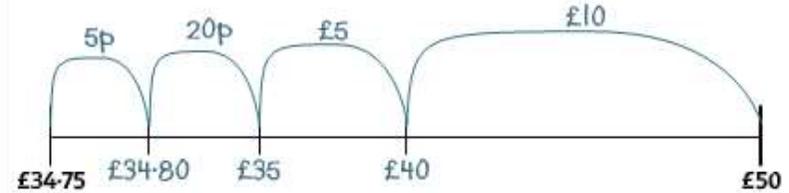
Recognise complements of any fraction to 1

- - e.g. $1 - 1/4 = 3/4$
- - e.g. $1 - 3/5 = 2/5$

Year 4

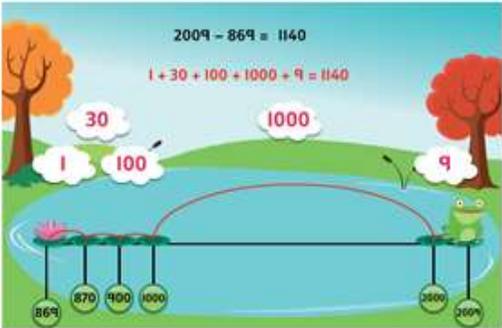
Use counting up subtraction to find change from £10, £20, £50 and £100

e.g. Buy a computer game for £34.75 using £50



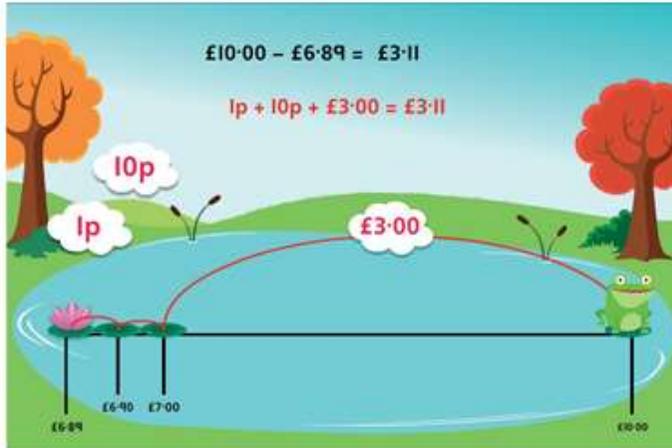
Subtract like fractions

- - - e.g. $3/8 - 1/8 = 2/8$

Mental Subtraction	Year 5	Year 6
	<p>Taking away Use place value to subtract decimals e.g. $4.58 - 0.08$ e.g. $6.26 - 0.2$ Take away multiples of powers of 10 e.g. $15\ 672 - 300$ e.g. $4.82 - 2$ e.g. $2.71 - 0.5$ e.g. $4.68 - 0.02$ Partitioning or counting back e.g. $3964 - 1051$ e.g. $5.72 - 2.01$ Subtract near multiples of 1, 10, 100, 1000, 10 000 or £1 e.g. $86\ 456 - 9999$ e.g. $3.58 - 1.99$</p> <p>Counting up Find a difference between two numbers by counting up from the smaller to the larger e.g. $£12.05 - £9.59$ e.g. $2009 - 869$</p> 	<p>Taking away Use place value to subtract decimals e.g. $7.782 - 0.08$ e.g. $16.263 - 0.2$ Take away multiples of powers of 10 e.g. $132\ 956 - 400$ e.g. $686\ 109 - 40\ 000$ e.g. $7.823 - 0.5$ Partitioning or counting back e.g. $3964 - 1051$ e.g. $5.72 - 2.01$ Subtract near multiples of powers of 10 e.g. $360\ 078 - 99\ 998$ e.g. $12.831 - 0.99$</p>

Year 5

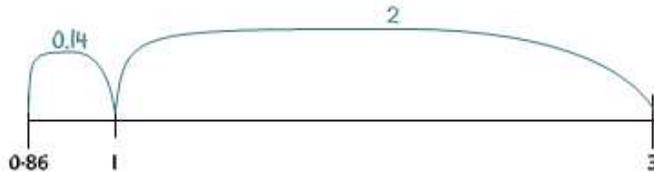
Find change using shopkeepers' addition
e.g. Buy a toy for £6.89 using £10.00



Find a difference between two amounts of money by counting up

Using number facts

Derived facts from number bonds to 10 and 100
e.g. $2 - 0.45$ using $45 + 55 = 100$
e.g. $3 - 0.86$ using $86 + 14 = 100$



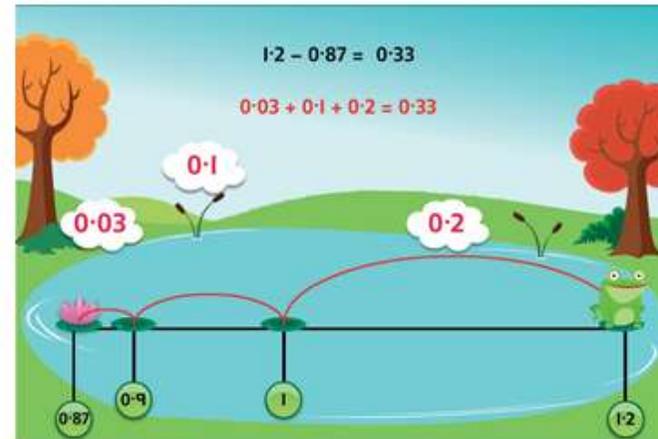
Number bonds to £1, £10 and £100

e.g. $£4.00 - £3.86$
e.g. $£100 - £66$ using $66 + 34 = 100$

Year 6

Counting up

Find a difference between two decimal numbers by counting up from the smaller to the larger
e.g. $1.2 - 0.87$



Using number facts

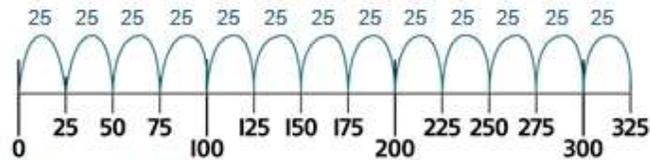
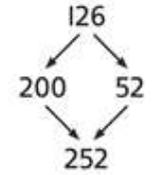
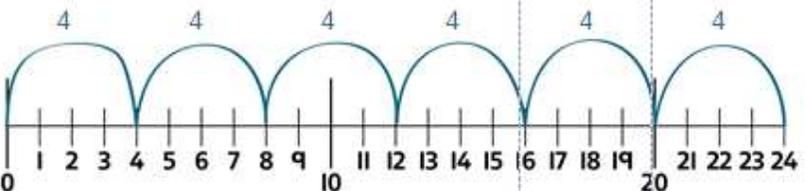
Derived facts from number bonds to 10 and 100
e.g. $0.1 - 0.075$ using $75 + 25 = 100$
e.g. $5 - 0.65$ using $65 + 35 = 100$



Number bonds to £1, £10 and £100

e.g. $£7.00 - £4.37$
e.g. $£100 - £66.20$ using $20p + 80p = £1$ and $£67 + £33 = £100$

Written Subtraction	Year 5	Year 6
	<p>Compact column subtraction for numbers with up to 5 digits e.g. $16\ 324 - 8516$</p> $\begin{array}{r} 0\ 15\ 13\ 1\ 14 \\ \cancel{X}\ \cancel{X}\ \cancel{X}\ \cancel{X}\ \cancel{X} \\ -\ 8\ 5\ 1\ 6 \\ \hline 7\ 8\ 0\ 8 \end{array}$ <p>Continue to use counting up subtraction for subtractions involving money, including finding change e.g. $£50 - £28.76$</p> <p>Use counting up subtraction to subtract decimal numbers</p> <p>e.g. $4.2 - 1.74$</p> <p>Subtract related fractions - - - e.g. $\frac{3}{4} - \frac{1}{8} = \frac{5}{8}$</p> <p>NB Counting up subtraction provides a default method for ALL children</p>	<p>Compact column subtraction for large numbers e.g. $34\ 685 - 16\ 458$</p> $\begin{array}{r} 2\ 14\ 7\ 15 \\ \cancel{X}\ \cancel{X}\ 6\ \cancel{X}\ \cancel{X} \\ -\ 1\ 6\ 4\ 5\ 8 \\ \hline 1\ 8\ 2\ 2\ 7 \end{array}$ <p>Use counting up for subtractions where the larger number is a multiple or near multiple of 1000 or 10000 Use counting up subtraction when dealing with money e.g. $£100 - £78.56$ e.g. $£45.23 - £27.57$</p> <p>Use counting up subtraction to subtract decimal numbers e.g. $13.1 - 2.37$</p> <p>Subtract unlike fractions, including mixed numbers - - - e.g. $\frac{3}{4} - \frac{1}{3} = \frac{5}{12}$ - - - e.g. $2\ \frac{3}{4} - 1\ \frac{1}{3} = 1\ \frac{5}{12}$</p> <p>NB Counting up subtraction provides a default method for ALL children</p>

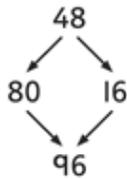
	Year 3	Year 4																																																																																																				
Mental Multiplication	<p>Counting in steps ('clever' counting) Count in 2s, 3s, 4s, 5s, 8s and 10s</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr> <tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> <tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr> <tr><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td>50</td></tr> <tr><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td></tr> <tr><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td></tr> <tr><td>71</td><td>72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td>80</td></tr> <tr><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td><td>87</td><td>88</td><td>89</td><td>90</td></tr> <tr><td>91</td><td>92</td><td>93</td><td>94</td><td>95</td><td>96</td><td>97</td><td>98</td><td>99</td><td>100</td></tr> </table>	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	<p>Counting in steps (sequences) Count in 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s, 11s, 12s, 25s, 50s, 100s and 1000s</p> 
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		<p>Doubling and halving Find doubles to double 100 and beyond using partitioning e.g. <i>double 126</i></p> <div style="text-align: center;">  </div>																																																																																																				
		<p>Begin to double amounts of money e.g. <i>£3.50 doubled is £7</i></p> <div style="text-align: center;">  </div>																																																																																																				
		<p>Use doubling as a strategy in multiplying by 2, 4 and 8 e.g. <i>34 × 4 is double 34 (68) doubled again = 136</i></p>																																																																																																				

Year 3

Doubling and halving

Find doubles of numbers to 50 using partitioning

e.g. *double 48*



Use doubling as a strategy in multiplying by 2

e.g. *18 × 2 is double 18 = 36*

Grouping

Recognise that multiplication is commutative

e.g. $4 \times 8 = 8 \times 4$

Multiply multiples of 10 by 1-digit numbers

e.g. $30 \times 8 = 240$

Multiply 'friendly' 2-digit numbers by 1-digit numbers

e.g. 13×4

Using number facts

Know doubles to double 20

e.g. *double 15 is 30*

Know doubles of multiples of 5 to 100

e.g. *double 85 is 170*

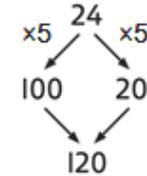
Know $\times 2, \times 3, \times 4, \times 5, \times 8, \times 10$ tables facts

Year 4

Grouping

Use partitioning to multiply 2-digit numbers by 1-digit numbers

e.g. 24×5



Multiply multiples of 100 and 1000 by 1-digit numbers using tables facts

e.g. $400 \times 8 = 3200$

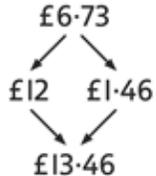
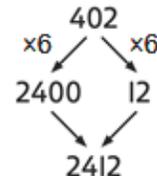
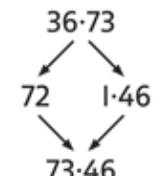
Multiply near multiples by rounding e.g.

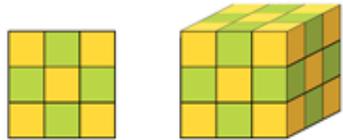
24×19 as $(24 \times 20) - 24 = 456$

Using number facts

Know times-tables up to 12×12

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Mental Multiplication	Year 5	Year 6
	<p>Doubling and halving Double amounts of money using partitioning e.g. double £6.73</p>  <p>Use doubling and halving as a strategy in multiplying by 2, 4, 8, 5 and 20 e.g. 58×5 is half of 58×10 (580) = 290</p> <p>Grouping Multiply whole numbers and decimals by 10, 100, 1000 e.g. $3.4 \times 100 = 340$ Use partitioning to multiply 'friendly' 2- and 3-digit numbers by 1-digit numbers e.g. 402×6 as 400×6 (2400) and 2×6 (12) = 2412</p>  <p>Use partitioning to multiply decimal numbers by 1-digit numbers e.g. 4.5×3 as 4×3 (12) and 0.5×3 (1.5) = 13.5 Multiply near multiples by rounding e.g. 32×29 as $(32 \times 30) - 32 = 928$</p>	<p>Doubling and halving Double decimal numbers with up to 2 places using partitioning e.g. double 36.73</p>  <p>Use doubling and halving as strategies in mental multiplication</p> <p>Grouping Use partitioning as a strategy in mental multiplication, as appropriate e.g. 3060×4 as 3000×4 (12 000) and 60×4 (240) = 12 240 e.g. 8.4×8 as 8×8 (64) and 0.4×8 (3.2) = 67.2 Use factors in mental multiplication e.g. 421×6 as 421×3 (1263) doubled = 2526 e.g. 3.42×5 as half of $3.42 \times 10 = 17.1$ Multiply decimal numbers using near multiples by rounding e.g. 4.3×19 as $(4.3 \times 20) - 4.3 = 81.7$</p>

	Year 5	Year 6
Mental Multiplication	<p>Using number facts</p> <p>Use times-tables facts up to 12×12 to multiply multiples of 10/100 of the multiplier e.g. $4 \times 6 = 24$ so $40 \times 6 = 240$ and $400 \times 6 = 2400$</p> <p>Use knowledge of factors and multiples in multiplication e.g. 43×6 is double 43×3 e.g. 28×50 is half of 28×100 (2800) = 1400</p> <p>Know square numbers and cube numbers</p> 	<p>Using number facts</p> <p>Use times-tables facts up to 12×12 in mental multiplication of large numbers or numbers with up to 2 decimal places e.g. $6 \times 4 = 24$ and $0.06 \times 4 = 0.24$</p>
Written Multiplication	<p>Short multiplication of 2-, 3- and 4-digit numbers by 1-digit numbers e.g. 435×8</p> $\begin{array}{r} 435 \\ \times 8 \\ \hline 24 \\ \hline 3480 \end{array}$ <p>Long multiplication of 2-, 3- and 4-digit numbers by 'teen' numbers e.g. 48×16</p> $\begin{array}{r} 48 \\ \times 16 \\ \hline 480 \\ 288 \\ \hline 768 \end{array}$	<p>Short multiplication of 2-, 3- and 4-digit numbers by 1-digit numbers e.g. 3743×6</p> $\begin{array}{r} 3743 \\ \times 6 \\ \hline 421 \\ \hline 22458 \end{array}$ <p>Long multiplication of 2-, 3- and 4-digit numbers by 2-digit numbers e.g. 456×38</p> $\begin{array}{r} 456 \\ \times 38 \\ \hline 13680 \\ 3648 \\ \hline 17328 \end{array}$

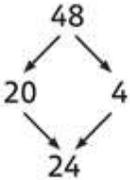
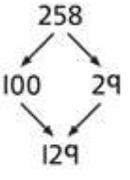


Written Multiplication	Year 5	Year 6																																																																																												
	<p>Grid multiplication of numbers with up to 2 decimal places by 1-digit numbers e.g. 1.34×6</p> <table border="1" data-bbox="448 454 784 558"> <tr> <td>x</td> <td>1</td> <td>0.3</td> <td>0.04</td> </tr> <tr> <td>6</td> <td>6</td> <td>1.8</td> <td>0.24</td> </tr> </table> <p>= 8.04</p> <p>Multiply fractions by 1-digit numbers e.g. $\frac{3}{4} \times 6 = \frac{18}{4} = 4 \frac{2}{4} = 4 \frac{1}{2}$</p>  <p>NB Grid multiplication provides a default method for ALL children</p>	x	1	0.3	0.04	6	6	1.8	0.24	<p>Short multiplication of decimal numbers using $\times 100$ and $\div 100$ e.g. 13.72×6 as $(1372 \times 6) \div 100 = 82.32$</p> <p>Short multiplication of money e.g. $\pounds 13.72 \times 6$</p> <table border="0" data-bbox="1433 486 1635 662"> <tr> <td></td> <td>£</td> <td>1</td> <td>3</td> <td>.</td> <td>7</td> <td>2</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>x</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>6</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td>2</td> <td>4</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td>£</td> <td>8</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>2</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>.</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>3</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>2</td> </tr> </table> <p>Grid multiplication of numbers with up to 2 decimal places by 1-digit numbers e.g. 6.76×4</p> <table border="1" data-bbox="1355 798 1702 909"> <tr> <td>x</td> <td>6</td> <td>0.7</td> <td>0.06</td> </tr> <tr> <td>4</td> <td>24</td> <td>2.8</td> <td>0.24</td> </tr> </table> <p>= 27.04</p> <p>Multiply simple pairs of proper fractions e.g. $\frac{1}{2} \times \frac{1}{4} = \frac{1}{8}$ - - -</p> <p>NB Grid multiplication provides a default method for ALL children</p>		£	1	3	.	7	2								x						6													2	4													£	8							2							.							3							2	x	6	0.7	0.06	4	24	2.8
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Overview of Strategies and Methods – Division

	Year 3	Year 4																																																																																																				
Mental Division	<p>Counting in steps ('clever' counting) Count in 2s, 3s, 4s, 5s, 8s and 10s</p> <table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr> <tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> <tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr> <tr><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td>50</td></tr> <tr><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td></tr> <tr><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td></tr> <tr><td>71</td><td>72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td>80</td></tr> <tr><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td><td>87</td><td>88</td><td>89</td><td>90</td></tr> <tr><td>91</td><td>92</td><td>93</td><td>94</td><td>95</td><td>96</td><td>97</td><td>98</td><td>99</td><td>100</td></tr> </table>	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	<p>Counting in steps (sequences) Count in 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s, 11s, 12s, 25s, 50s, 100s and 1000s</p>
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Mental Division	Year 3	Year 4
	<p>Doubling and halving Find half of even numbers to 100 using partitioning e.g. find half of 48</p> <div data-bbox="622 464 752 644" style="text-align: center;">  </div> <p>Use halving as a strategy in dividing by 2 e.g. $36 \div 2$ is half of 36 = 18 Find half of odd numbers</p>	<p>Doubling and halving Find half of even numbers to 200 and beyond using partitioning e.g. find half of 258</p> <div data-bbox="1518 464 1648 644" style="text-align: center;">  </div> <p>Begin to halve amounts of money e.g. £9 halved is £4.50</p> <div data-bbox="1234 759 1906 983" style="text-align: center;">  </div> <p>Use halving as a strategy in dividing by 2, 4 and 8 e.g. $164 \div 4$ is half of 164 (82) halved again = 41</p>

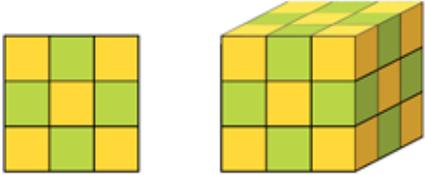
Mental Division	Year 3	Year 4											
	<p>Grouping Recognise that division is not commutative e.g. $16 \div 8$ does not equal $8 \div 16$ Relate division to multiplications 'with holes in' e.g. $_ \times 5 = 30$ is the same calculation as $30 \div 5 = _$ thus we can count in 5s to find the answer</p>  <p style="text-align: center;">$_ \times \text{£}5 = \text{£}30$</p> <p>Divide multiples of 10 by 1-digit numbers e.g. $240 \div 8 = 30$ Begin to use subtraction of multiples of 10 of the divisor to divide numbers above the 10th multiple e.g. $52 \div 4$ is 10×4 (40) and 3×4 (12) = 13</p>	<p>Grouping Use multiples of 10 times the divisor to divide by 1-digit numbers above the tables facts e.g. $45 \div 3$ as 10×3 (30) and 5×3 (15)</p> $45 \div 3 = \square$ <table style="margin-left: auto; margin-right: auto;"> <tr> <td>$\square \times 3 = 45$</td> <td>$45 \div 3 = 15$</td> </tr> <tr> <td>$10 \times 3 = 30$</td> <td></td> </tr> <tr> <td style="text-align: right;">15</td> <td></td> </tr> <tr> <td>$5 \times 3 = 15$</td> <td></td> </tr> <tr> <td style="text-align: right;">0</td> <td></td> </tr> <tr> <td>15</td> <td style="text-align: center;">↑</td> </tr> </table> <p>Divide multiples of 100 by 1-digit numbers using division facts e.g. $3200 \div 8 = 400$</p>	$\square \times 3 = 45$	$45 \div 3 = 15$	$10 \times 3 = 30$		15		$5 \times 3 = 15$		0		15
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Overview of Strategies and Methods – Division

	Year 3	Year 4																																																																																																																																																																									
Mental Division	<p>Using number facts Know half of even numbers to 40 Know half of multiples of 10 to 200 e.g. <i>half of 170 is 85</i> Know $\times 2$, $\times 3$, $\times 4$, $\times 5$, $\times 8$, $\times 10$ division facts</p>	<p>Using number facts Know times-tables up to 12×12 and all related division facts</p> <table border="1"> <thead> <tr> <th>\times</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> <th>10</th> <th>11</th> <th>12</th> </tr> </thead> <tbody> <tr> <th>1</th> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> <td>10</td> <td>11</td> <td>12</td> </tr> <tr> <th>2</th> <td>2</td> <td>4</td> <td>6</td> <td>8</td> <td>10</td> <td>12</td> <td>14</td> <td>16</td> <td>18</td> <td>20</td> <td>22</td> <td>24</td> </tr> <tr> <th>3</th> <td>3</td> <td>6</td> <td>9</td> <td>12</td> <td>15</td> <td>18</td> <td>21</td> <td>24</td> <td>27</td> <td>30</td> <td>33</td> <td>36</td> </tr> <tr> <th>4</th> <td>4</td> <td>8</td> <td>12</td> <td>16</td> <td>20</td> <td>24</td> <td>28</td> <td>32</td> <td>36</td> <td>40</td> <td>44</td> <td>48</td> </tr> <tr> <th>5</th> <td>5</td> <td>10</td> <td>15</td> <td>20</td> <td>25</td> <td>30</td> <td>35</td> <td>40</td> <td>45</td> <td>50</td> <td>55</td> <td>60</td> </tr> <tr> <th>6</th> <td>6</td> <td>12</td> <td>18</td> <td>24</td> <td>30</td> <td>36</td> <td>42</td> <td>48</td> <td>54</td> <td>60</td> <td>66</td> <td>72</td> </tr> <tr> <th>7</th> <td>7</td> <td>14</td> <td>21</td> <td>28</td> <td>35</td> <td>42</td> <td>49</td> <td>56</td> <td>63</td> <td>70</td> <td>77</td> <td>84</td> </tr> <tr> <th>8</th> <td>8</td> <td>16</td> <td>24</td> <td>32</td> <td>40</td> <td>48</td> <td>56</td> <td>64</td> <td>72</td> <td>80</td> <td>88</td> <td>96</td> </tr> <tr> <th>9</th> <td>9</td> <td>18</td> <td>27</td> <td>36</td> <td>45</td> <td>54</td> <td>63</td> <td>72</td> <td>81</td> <td>90</td> <td>99</td> <td>108</td> </tr> <tr> <th>10</th> <td>10</td> <td>20</td> <td>30</td> <td>40</td> <td>50</td> <td>60</td> <td>70</td> <td>80</td> <td>90</td> <td>100</td> <td>110</td> <td>120</td> </tr> <tr> <th>11</th> <td>11</td> <td>22</td> <td>33</td> <td>44</td> <td>55</td> <td>66</td> <td>77</td> <td>88</td> <td>99</td> <td>110</td> <td>121</td> <td>132</td> </tr> <tr> <th>12</th> <td>12</td> <td>24</td> <td>36</td> <td>48</td> <td>60</td> <td>72</td> <td>84</td> <td>96</td> <td>108</td> <td>120</td> <td>132</td> <td>144</td> </tr> </tbody> </table>	\times	1	2	3	4	5	6	7	8	9	10	11	12	1	1	2	3	4	5	6	7	8	9	10	11	12	2	2	4	6	8	10	12	14	16	18	20	22	24	3	3	6	9	12	15	18	21	24	27	30	33	36	4	4	8	12	16	20	24	28	32	36	40	44	48	5	5	10	15	20	25	30	35	40	45	50	55	60	6	6	12	18	24	30	36	42	48	54	60	66	72	7	7	14	21	28	35	42	49	56	63	70	77	84	8	8	16	24	32	40	48	56	64	72	80	88	96	9	9	18	27	36	45	54	63	72	81	90	99	108	10	10	20	30	40	50	60	70	80	90	100	110	120	11	11	22	33	44	55	66	77	88	99	110	121	132	12	12	24	36	48	60	72	84	96	108	120	132	144
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Written Division	<p>Perform divisions just above the 10th multiple using written jottings, understanding how to give a remainder as a whole number Use division facts to find unit and simple non-unit fractions of amounts within the times-tables - e.g. <i>3/4 of 48 is $3 \times (48 \div 4) = 36$</i></p>	<p>Use a written version of a mental method to divide 2- and 3-digit numbers by 1-digit numbers e.g. <i>$86 \div 3$ as 20×3 (60) and 8×3 (24), remainder 2</i></p> $86 \div 3 = \square$ $\square \times 3 = 86 \quad 86 \div 3 = 28 \text{ r}2$ $\begin{array}{r} 20 \times 3 = 60 \\ \hline 26 \\ 8 \times 3 = 24 \\ \hline 2 \end{array}$ <p>Use division facts to find unit and non-unit fractions of amounts within the times-tables - e.g. <i>7/8 of 56 is $7 \times (56 \div 8) = 48$</i></p>																																																																																																																																																																									

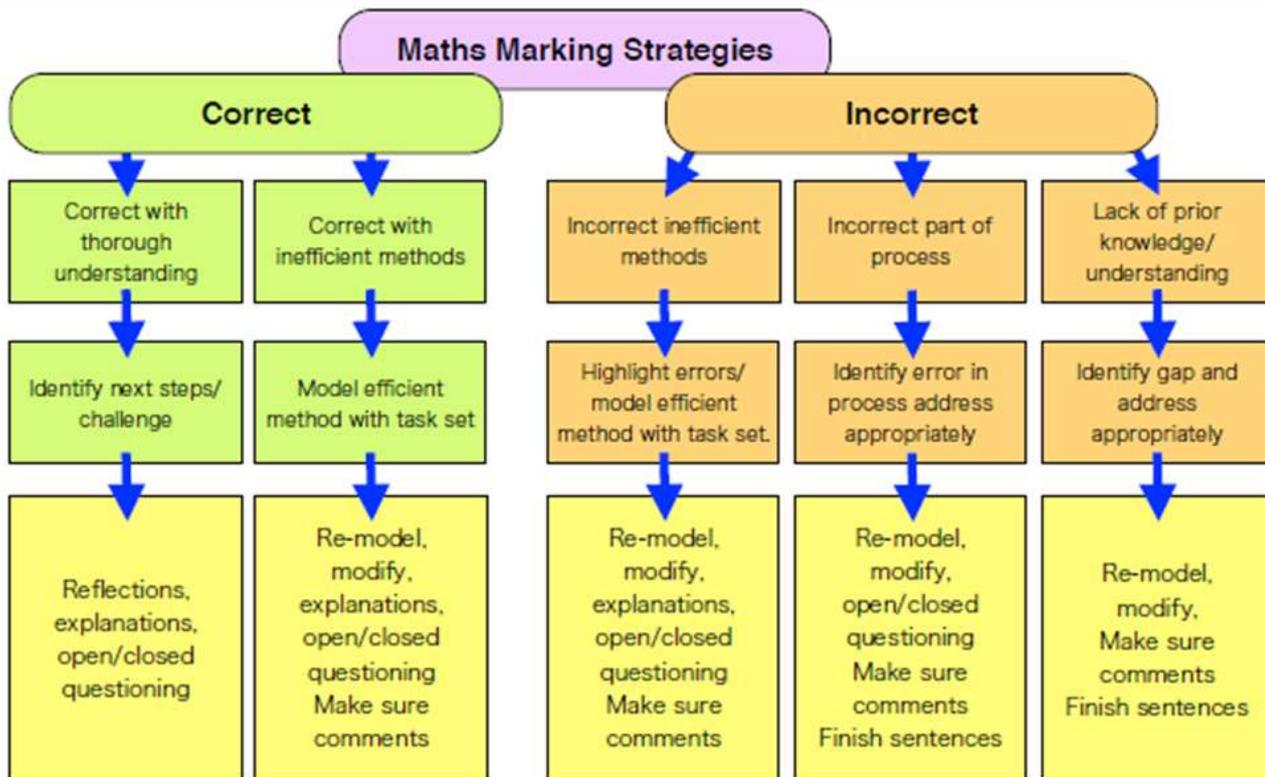
Mental Division	Year 5	Year 6															
	<p>Doubling and halving Halve amounts of money using partitioning e.g. half of £14.84 is half of £14 (£7) plus half of 84p (42p)</p> <div style="text-align: center;"> </div> <p>Use doubling and halving as a strategy in dividing by 2, 4, 8, 5 and 20 e.g. $115 \div 5$ as <i>double</i> 115 (230) $\div 10 = 23$</p> <p>Grouping Divide numbers by 10, 100, 1000 to obtain decimal answers with up to 3 decimal places e.g. $340 \div 100 = 3.4$</p> <p>Use the 10th, 20th, 30th ... multiple of the divisor to divide 'friendly' 2- and 3-digit numbers by 1-digit numbers e.g. $186 \div 6$ as 30×6 (180) and 1×6 (6)</p> <div style="text-align: center;"> $186 \div 6 = \square$ $\square \times 6 = 186$ $30 \times 6 = 180$ <hr style="width: 100px; margin-left: 0;"/> <div style="display: flex; justify-content: space-between; width: 100px;"> 6 </div> <hr style="width: 100px; margin-left: 0;"/> <div style="display: flex; justify-content: space-between; width: 100px;"> 1 </div> <hr style="width: 100px; margin-left: 0;"/> <div style="display: flex; justify-content: space-between; width: 100px;"> 6 </div> <hr style="width: 100px; margin-left: 0;"/> <div style="display: flex; justify-content: space-between; width: 100px;"> 0 </div> <hr style="width: 100px; margin-left: 0;"/> <div style="display: flex; justify-content: space-between; width: 100px;"> 31 </div> </div>	<p>Doubling and halving Halve decimal numbers with up to 2 places using partitioning e.g. half of 36.86 is half of 36 (18) plus half of 0.86 (0.43)</p> <div style="text-align: center;"> </div> <p>Use doubling and halving as strategies in mental division</p> <p>Grouping Use the 10th, 20th, 30th, ... or 100th, 200th, 300th ... multiples of the divisor to divide large numbers e.g. $378 \div 9$ as 40×9 (360) and 2×9 (18), remainder 2</p> <div style="text-align: center;"> $378 \div 9 = \square$ $\square \times 9 = 378$ $378 \div 9 = 42 \text{ r}2$ <table style="border-collapse: collapse; margin: auto;"> <tr> <td style="border-right: 1px solid black; padding: 5px;">40</td> <td style="padding: 5px;">$\times 9 = 360$</td> <td style="border-right: 1px solid black; width: 20px;"></td> <td style="width: 20px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;"></td> <td style="padding: 5px; text-align: right;">18</td> <td style="border-right: 1px solid black;"></td> <td></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">2</td> <td style="padding: 5px;">$\times 9 = 18$</td> <td style="border-right: 1px solid black;"></td> <td></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">42</td> <td style="padding: 5px; text-align: right;">2</td> <td style="border-right: 1px solid black;"></td> <td></td> </tr> </table> </div> <p>Use tests for divisibility e.g. 135 divides by 3, as $1 + 3 + 5 = 9$ and 9 is in the $\times 3$ table</p>	40	$\times 9 = 360$				18			2	$\times 9 = 18$			42	2	
40	$\times 9 = 360$																
	18																
2	$\times 9 = 18$																
42	2																

	Year 5	Year 6												
Mental Division	<p>Using number facts</p> <p>Use division facts from the times-tables up to 12×12 to divide multiples of powers of 10 of the divisor e.g. $3600 \div 9$ using $36 \div 9$</p> <p>Know square numbers and cube numbers</p> 	<p>Using number facts</p> <p>Use division facts from the times-tables up to 12×12 to divide decimal numbers by 1-digit numbers e.g. $1.17 \div 3$ is $1/100$ of $117 \div 3$ (39)</p> <p>Know tests of divisibility for numbers divisible by 2, 3, 4, 5, 9, 10 and 25</p>												
Written Division	<p>Use a written version of a mental strategy to divide 3-digit numbers by 1-digit numbers e.g. $326 \div 6$ as 50×6 (300) and 4×6 (24), remainder 2</p> $326 \div 6 = \square$ <table style="margin-left: 20px;"> <tr> <td>$\square \times 6 = 326$</td> <td>$326 \div 6 = 54 \text{ r}2$</td> </tr> <tr> <td>$50 \times 6 = 300$</td> <td></td> </tr> <tr> <td style="padding-left: 20px;">26</td> <td></td> </tr> <tr> <td>$4 \times 6 = 24$</td> <td></td> </tr> <tr> <td style="padding-left: 20px;">2</td> <td></td> </tr> <tr> <td>54</td> <td></td> </tr> </table>	$\square \times 6 = 326$	$326 \div 6 = 54 \text{ r}2$	$50 \times 6 = 300$		26		$4 \times 6 = 24$		2		54		<p>Short division of 3- and 4-digit numbers by 1-digit numbers e.g. $139 \div 3$</p> $ \begin{array}{r} 46 \text{ r}1 \\ 3 \overline{) 139} \\ \underline{12} \\ 19 \\ \underline{18} \\ 1 \end{array} $ <p>Long division of 3- and 4-digit numbers by 2-digit numbers e.g. $4176 \div 13$</p> $ \begin{array}{r} 300 + 20 + 1, \text{ r}3 \\ 13 \overline{) 4176} \\ \underline{-3900} \\ 276 \\ \underline{-260} \\ 16 \\ \underline{-13} \\ 3 \end{array} $ <p>$4176 \div 13 = 321 \text{ r}3$</p>
$\square \times 6 = 326$	$326 \div 6 = 54 \text{ r}2$													
$50 \times 6 = 300$														
26														
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2														
54														



Overview of Strategies and Methods – Division

Written Division	Year 5	Year 6
	<p>Short division of 3- and 4-digit numbers by 1-digit numbers e.g. $139 \div 3$</p> $\begin{array}{r} 46 \text{ r } 1 \\ 3 \overline{) 139} \end{array}$ <p>Give remainders as whole numbers or as fractions Find unit and non-unit fractions of large amounts - e.g. $\frac{3}{5}$ of 265 is $3 \times (265 \div 5) = 159$ Turn improper fractions into mixed numbers and vice versa</p>	<p>Give remainders as whole numbers, fractions or decimals Use place value to divide 1- and 2-place decimals by numbers ≤ 12 e.g. $3.65 \div 5$ as $(365 \div 5) \div 100 = 0.73$ Divide proper fractions by whole numbers</p>



Possible responses might look like this...

Explanations

Ask children to explain reasons for mathematical statements
 Would a chocolate lover $\frac{1}{2}$ or $\frac{1}{3}$ of a bar of chocolate?
 What tips would you give someone who is learning to round numbers to the nearest 10?
 Explain why a number ending in 3 cannot be a multiple of 4.
 Why is 16 a square number?

Re-Modelling

If child recorded	Model the correct method
$52 - 38 =$	$52 - 38 =$
$50 - 30 = 20$	$52 - 30 = 22$
$8 - 2 = 6$	$22 - 8 = 14$
$52 - 38 = 26$	Now try this one...

Finishing sentences

Provide children with appropriate mathematical sentences to complete
 36 can be partitioned into _____ and _____
 Two numbers < 200 are _____ and _____
 All multiples of 5 end with _____ and _____
 Acute angles are _____
 A pencil weighs about _____

Make sure comments

Provide children with reminders for next time
 Make sure you count on from the larger number
 Make sure you record one hundred and two as 102 not 1002

Reflections

Ask children to think deeply about their work
 Could there be a quicker way to do this?
 Do you think that this could work with other numbers?
 When could you use this strategy?
 Have you thought of all possibilities? Can you be sure?

Closed questions

Provide children with questions that have only one answer
 If you start with 93 and count back in 10s what would be the smallest number you would reach on a 100 square.
 Put these numbers in order 836, 535, 388, 508. What would the second number be?
 I buy three books costing each costing £2.99, How much do I spend to the nearest whole pound?
 A 90 minute film starts at 4:15pm at what time will it end?

Open questions

Provide children with questions that have more than one answer
 Tell me 2 three digit numbers with a difference of 26
 Give me three division questions with a remainder of 1
 What 3 lengths total 1m? _____ + 9 = 3__

Modifying

Use comments that challenge the children to look over their own work and processes used.
 Can you see where you have made your mistake?
 Check your place value in Q5 and correct it.
 I calculate the answer to be X, check if I am right.