

Unit 3
Addition and subtraction 2

Five daily lessons

National
Numeracy Strategy

Year 4
Summer term

Unit Objectives
Year 4

- **Develop and refine written methods for column subtraction of two whole numbers less than 1000;** money calculations (for example £7.85 + or – £3.49).
- **Choose and use appropriate number operations and appropriate ways of calculating (mental, mental with jottings, pencil and paper) to solve problems.**
- Use all four operations to solve word problems involving numbers in ‘real life’ and money using one or more steps, including converting pounds to pence.
- Use knowledge of sums or differences of odd/even numbers.

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Pages 82, 84

Page 72

This Unit Plan is designed to guide your teaching. You will need to adapt it to meet the needs of your class.

Resources needed to teach this unit:

- Resource sheet 3.1
- Resource sheet 3.2
- Activity sheet 3.1
- Whiteboards
- Coins
- Large sheet of card

Year 3

Link Objectives

Year 5

- Use informal pencil and paper methods to support, record or explain $HTU \pm TU$, $HTU \pm HTU$.
- Begin to use column addition and subtraction for $HTU \pm TU$ where the calculation cannot easily be done mentally.
- **Choose and use appropriate operations (including multiplication and division) to solve word problems,** and appropriate ways of calculating: mental, mental with jottings, pencil and paper.
- Solve word problems involving numbers in ‘real life’ and money, using one or more steps, including finding totals and giving change, and working out which coins are needed to pay. Explain how the problem was solved.

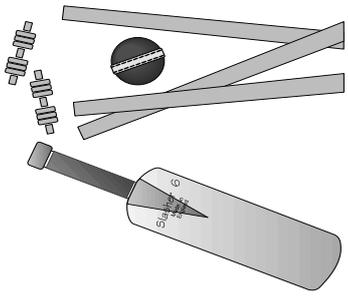
- **Extend written methods to: column addition/ subtraction of two integers less than 10 000;** addition of more than two integers less than 10 000; addition or subtraction of a pair of decimal fractions both with one or both with two decimal places.
- Choose and use appropriate number operations to solve problems, and appropriate ways of calculating: mental, mental with jottings, written methods, and calculator.
- **Use all four operations to solve simple word problems involving numbers and quantities** based on ‘real life’ and money, using one or more steps, including solving simple conversions of pounds to foreign currency and finding simple percentages.
- Use knowledge of sums and differences of odd/even numbers.

(Key objectives in bold)

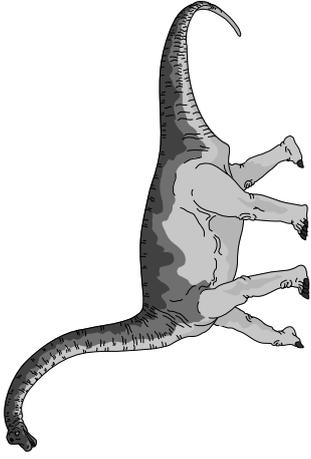
Planning sheet	Day One	Unit 3 <i>Addition and subtraction 2</i>	Term: <i>Summer</i>	Year Group: <i>4</i>
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions
<p>Derive quickly all number pairs that total 100.</p>	<ul style="list-style-type: none"> Ask the children to draw a 3×3 grid, then enter any number in a given range, e.g. between 20 and 50. Call out numbers between 50 and 80 and have the children cross out if they have the complement to 100. The first child to cross out all their numbers has to give a number fact using one of their numbers, e.g. $28 + 72 = 100$. <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Q What other number facts can we make from this one?</p> </div> <p>Record all suggestions on the board, e.g.</p> <p style="margin-left: 40px;">$100 - 28 = 72$ $72 + 28 = 100$ $100 - 72 = 28$</p>	<p>Develop and refine written methods for column subtraction of two whole numbers less than 1000.</p> <p style="text-align: right; margin-top: 200px;">VOCABULARY subtract difference counting up column strategy operation</p>	<ul style="list-style-type: none"> Provide a context for subtraction, e.g. I had £825 in the bank. I spent £163 on car repairs. How much did I have left? <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Q Which operation do we need to find the answer?</p> </div> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Q What calculation is needed to work out the answer?</p> </div> <p>Establish that subtraction is needed and that the calculation is $825 - 163$.</p> <ul style="list-style-type: none"> Remind the children (invite one up to model if appropriate) how to work out $825 - 163$ by counting up, using the empty number line. <div style="text-align: center; margin: 10px 0;"> </div> <p>Answer: $600 + 37 + 25 = 662$</p> <ul style="list-style-type: none"> Have two sets of six three-digit numbers on the board. Set one number between 650 and 999; set two numbers between 100 and 500. Ask a child to choose one number from each set, and use for a subtraction. Model the method again on a number line. <div style="text-align: center; margin: 10px 0;"> </div> <div style="text-align: center; margin: 10px 0;"> <pre> 684 - 268 ----- 32 (to 300) 300 (to 600) 84 (to 684) ----- 416 </pre> </div> <ul style="list-style-type: none"> Remind the class how this process can be done as a written calculation in columns. <ul style="list-style-type: none"> Emphasise the need to align numbers in the correct columns. Set an example for the children to practise using a reasonable time, demonstrate the column method, asking the children to prompt as you do so. Clarify misconceptions observed. Ask the children to practise further examples by choosing pairs of numbers, one from each set on the board. 	<ul style="list-style-type: none"> Invite the children, in pairs, to discuss the methods they would use for each of the following: $261 - 258$ $261 - 204$ $261 - 241$ $261 - 232$ Take feedback and establish that different strategies are used, depending on the numbers being subtracted. <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Q Is a column method needed for any of these?</p> </div> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Q What about $746 - 387$?</p> </div> <p>Establish that this is a more difficult subtraction to do mentally and that a written column method might be useful.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>By the end of the lesson the children should be able to:</p> <ul style="list-style-type: none"> Use a written column method to find the difference between two three-digit numbers. <p>(Refer to supplement of examples, section 6, page 50.)</p> </div>
VOCABULARY total				

Planning sheet	Day Two	Unit 3 <i>Addition and subtraction 2</i>	Term: <i>Summer</i>	Year Group: <i>4</i>
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions
<p>Recognise odd and even numbers up to 1000 and some of their properties.</p> <p>VOCABULARY odd even</p>	<ul style="list-style-type: none"> Ask the children to each think of a number less than 20. <div data-bbox="353 355 741 400" style="border: 1px solid black; padding: 2px;">Q Is your number odd or even?</div> <div data-bbox="353 424 741 469" style="border: 1px solid black; padding: 2px;">Q How do you know?</div> Establish that odd numbers end in 1, 3, 5, 7 or 9, even numbers in 0, 2, 4, 6 or 8. Display, e.g. on the board, for reference. Ask the children to each think of a number between 20 and 100. Ask them to raise their hands if their number is odd. Take a few examples and reinforce the rule for identifying the odd numbers. Ask them now to think of an even number between 100 and 1000. Take examples and reinforce as before. Draw two large shapes on the board or OHT. Label one 'odd numbers' and the other 'even numbers'. Call out a variety of three-digit numbers in turn, at least six of each. For each number ask a child to say whether it is odd or even. Record in the appropriate shape. 	<p>Use knowledge of sums or differences between odd and even numbers.</p> <p>Use written methods for column addition and subtraction of two whole numbers less than 1000.</p> <p>VOCABULARY sum difference written column method rule test</p> <p>RESOURCES Large sheet of card or similar for display</p>	<ul style="list-style-type: none"> Choose two appropriate numbers from the 'odd number' set on the board. Remind the class how to use the column method for addition using carrying, by modelling the calculation on the board with prompts from the children. <div data-bbox="1122 403 1794 448" style="border: 1px solid black; padding: 2px;">Q Is the answer odd or even?</div> <div data-bbox="1122 480 1794 541" style="border: 1px solid black; padding: 2px;">Q When two odd numbers are added, will the answer always be even?</div> <div data-bbox="1122 572 1794 617" style="border: 1px solid black; padding: 2px;">Q How could we find out?</div> Establish the need to test examples. Ask the children to choose two odd numbers from the board and find their total, using the carrying method unless the numbers are easy to add mentally. Take feedback and establish that odd + odd = even. Display the following, e.g. on card, as a vertical list: odd + odd = even; odd – odd = even; even + even = even; even – even = even; even + odd = odd; even – odd = odd; odd – even = odd; odd + even = odd; Explain that the children are to explore other results of sums and differences of odd and even numbers, using the numbers in the shapes for at least one example of each combination. Demonstrate the process for finding the difference between two odd numbers to reinforce the column method covered in the previous lesson. Remind the children that several examples are needed to be sure of the rule and that they should try with single-digit and two-digit numbers, as well as with those in the shapes. They should use written column methods for numbers which cannot easily be done mentally. Take feedback, asking for examples from different pairs for each combination of odd and even calculations. Discuss whether the results are conclusive, if necessary trying out further examples with small numbers mentally to give more evidence. Complete the answers in the list of properties. Leave on display for reference. 	<ul style="list-style-type: none"> Write some calculations on the board, some of which can be seen to be incorrect using properties of odd and even numbers, e.g. $437 + 25 = 463$; $860 - 328 = 532$; $58 + 76 = 136$; $852 - 485 = 367$; $683 - 275 = 409$. Ask the children to identify which of them are definitely incorrect by using the list of properties on display. <div data-bbox="1861 568 2175 636" style="border: 1px solid black; padding: 2px;">Q Can we be sure that all the others are correct?</div> Ask the children to give their reasoning. Use an example, $58 + 76$, to show that using odd and even rules to check is only a first stage to identify incorrect results, and that other ways are needed to ensure that an answer is correct. <div data-bbox="1832 903 2175 1281" style="border: 1px solid black; padding: 5px;"> <p>By the end of the lesson the children should be able to:</p> <ul style="list-style-type: none"> Add and subtract pairs of numbers less than 1000 using written column methods where needed; Use knowledge of sums and differences of odd and even numbers to indicate incorrect results. <p>(Refer to supplement of examples, section 6, pages 48, 50, 72.)</p> </div>

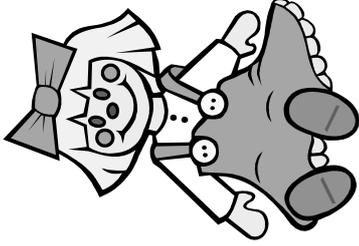
Planning sheet	Day Three	Unit 3 <i>Addition and subtraction 2</i>	Term: <i>Summer</i>	Year Group: <i>4</i>
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions
<p>Recall multiplication facts in $\times 2$, $\times 3$, $\times 4$, $\times 5$, $\times 10$ tables and derive division facts.</p> <p>Convert pence to pounds.</p> <p>VOCABULARY times multiplied by product how many... make... divided by</p> <p>RESOURCES 2p, 5p, 10p and 50p coins</p>	<ul style="list-style-type: none"> Ask the class to count in 2s to 20, then 3s to 30, 4s to 40, 5s to 50 and 10s to 100. Ask quick fire questions on associated multiplication and division facts using the range of vocabulary listed, e.g. 3 times 5; the product of 8 and 4; how many 3s make 21?; 80 divided by 10; 9 multiplied by 5. Show seven 5p pieces, and ask for the total. <div data-bbox="353 566 743 635" style="border: 1px solid black; padding: 5px;"> <p>Q How many more do I need to make £1.00?</p> </div> <p>Repeat with different multiples of coins. For large amounts, e.g. six 50p pieces, ask for the total in pence, then in pounds. Ask for the number required to make the next whole pound or £5.00.</p>	<p>Develop and refine written methods for money calculations.</p> <p>VOCABULARY decimal point align column reduction total</p> <p>RESOURCES Resource sheet 3.1</p>	<ul style="list-style-type: none"> Discuss with the class that recent lessons have included written column methods for adding and subtracting numbers which are not easy to do mentally, but that you have not yet considered such calculations with amounts of money. Write $\pounds 6.47 + \pounds 3.38$ on the board. <div data-bbox="1144 422 1792 491" style="border: 1px solid black; padding: 5px;"> <p>Q How could we use a written column method to work out the total?</p> </div> <p>Ask the children to explore this, then take feedback and discuss ideas. Model (or ask a volunteer to model) the use of the column method with carrying on the board. Emphasise the importance of aligning the decimal points, as well as the numbers, in columns. Reinforce by setting out $\pounds 3.68 + 87\text{p}$ incorrectly (with 8 beneath 3 and 7 beneath 6) and find the total. Set it out correctly and compare results, highlighting the effect of the error.</p> <ul style="list-style-type: none"> Provide two or three examples for the children to set out in columns and find totals. After a reasonable time discuss results, model any which have caused difficulties and deal with misconceptions. Repeat with finding differences between amounts of money, using the counting up method set out in columns as covered on day 1. Provide practice using Resource sheet 3.1. Explain that some of the prices have been reduced by one fifth. The amount of the reduction is written with the old price. Children should work out the new prices for these items, then choose pairs of toys and find the total cost. 	<ul style="list-style-type: none"> Discuss the activity and deal with any misconceptions. Agree the prices for the reduced items. <div data-bbox="1861 411 2184 480" style="border: 1px solid black; padding: 5px;"> <p>Q Which two toys together cost less than £10?</p> </div> <div data-bbox="1861 502 2184 571" style="border: 1px solid black; padding: 5px;"> <p>Q How much change from £10 would there be?</p> </div> <p>Establish the appropriate pairs of toys and the amount of change.</p> <div data-bbox="1832 699 2184 986" style="border: 1px solid black; padding: 5px;"> <p>By the end of the lesson the children should be able to:</p> <ul style="list-style-type: none"> Use written methods for column addition and subtraction of amounts of money. <p>(Refer to supplement of examples, section 6, pages 48, 50.)</p> </div>



£6.41



£7.05
£1.41 off



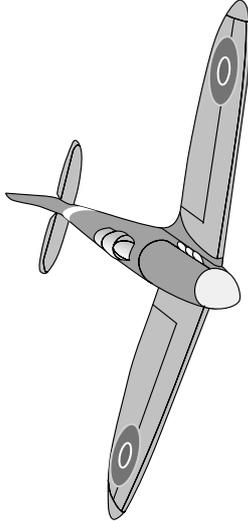
£5.76



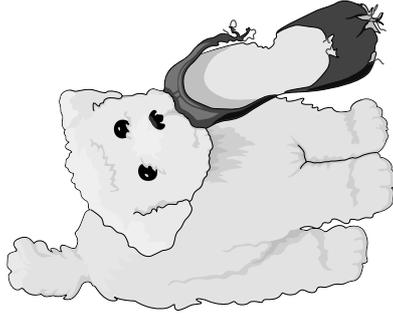
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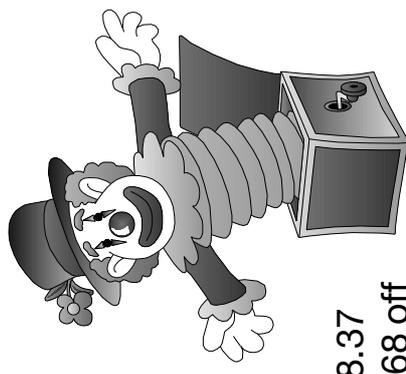
£7.68



£5.39



£6.35



£8.37
£1.68 off



£8.24
£1.65 off

Calculation	Using odd/even rules	Further check	Was it right?
$36 + 24 = 50$	even + even = even	$36 + 20 + 4 = 56 + 4$ $= 60$	X
$\begin{array}{r} 348 \\ + 563 \\ \hline 912 \\ \hline 11 \end{array}$	even + odd = odd	$\begin{array}{r} 348 \\ + 563 \\ \hline 911 \\ \hline 11 \end{array}$	X
$\begin{array}{r} 653 \\ - 487 \\ \hline 23 \text{ (to 500)} \\ \hline 150 \text{ (to 653)} \\ \hline 173 \end{array}$	odd – odd = even	$\begin{array}{r} 653 \\ - 487 \\ \hline 13 \text{ (to 500)} \\ + 153 \text{ (to 653)} \\ \hline 166 \end{array}$	X
$188 - 69 = 119$	even – odd = odd	$119 + 69 = 120 + 69$ $= 189 - 1$ $= 188$	✓

1. A school has 300 pupils. There are 10 classes. Approximately how many children are there in each class?
2. Each class in the same school has four computers. How many class computers are there in the school?
3. In Key Stage One 117 children stay at school for lunch. In Key Stage Two 168 children stay. How many children have lunch at school altogether?
4. Ten more than half of the children in the school are girls. How many boys are there?
5. School sweatshirts cost £6.85 each. Mrs Brown bought two for her daughter. How much change did she get from £20.00?