

# 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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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

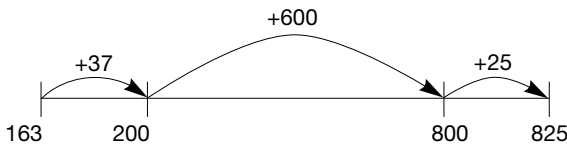
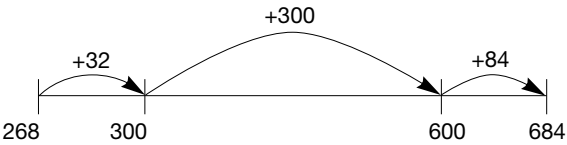
Year 5

- 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)

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education and skills

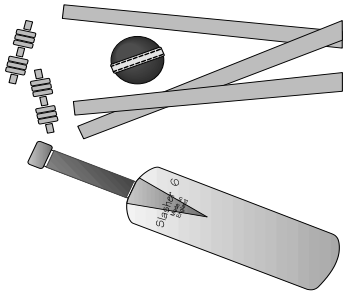
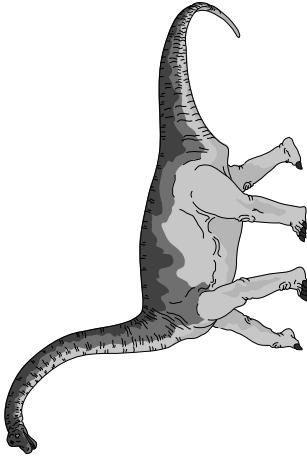
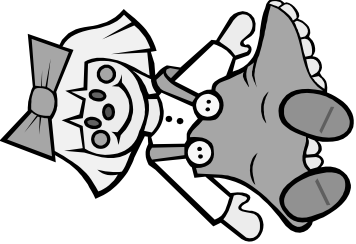
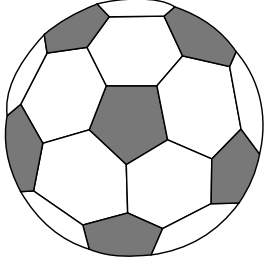

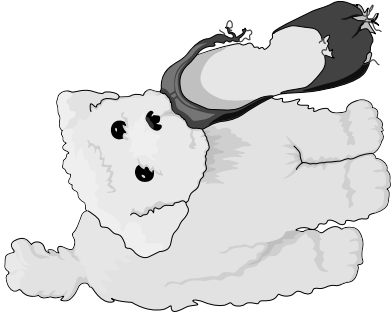
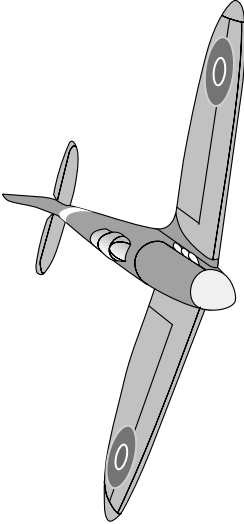


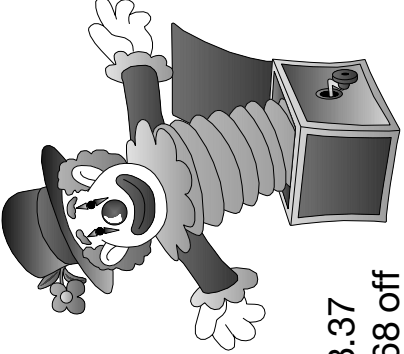
Planning sheet	Day One	Unit 3 <i>Addition and subtraction 2</i>	Term: <i>Summer</i>	Year Group: 4
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions
<p>Derive quickly all number pairs that total 100.</p>	<ul style="list-style-type: none"> <li>Ask the children to draw a <math>3 \times 3</math> grid, then enter any number in a given range, e.g. between 20 and 50.</li> <li>Call out numbers between 50 and 80 and have the children cross out if they have the complement to 100.</li> <li>The first child to cross out all their numbers has to give a number fact using one of their numbers, e.g. <math>28 + 72 = 100</math>.</li> </ul> <div>Q What other number facts can we make from this one?</div> <p>Record all suggestions on the board, e.g.</p> <p><math>100 - 28 = 72</math>  <math>72 + 28 = 100</math>  <math>100 - 72 = 28</math></p>	<p>Develop and refine written methods for column subtraction of two whole numbers less than 1000.</p>	<ul style="list-style-type: none"> <li>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?</li> </ul> <div>Q Which operation do we need to find the answer?</div> <div>Q What calculation is needed to work out the answer?</div> <p>Establish that subtraction is needed and that the calculation is <math>825 - 163</math>.</p> <ul style="list-style-type: none"> <li>Remind the children (invite one up to model if appropriate) how to work out <math>825 - 163</math> by counting up, using the empty number line.</li> </ul>  <p>Answer: <math>600 + 37 + 25 = 662</math></p> <ul style="list-style-type: none"> <li>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.</li> </ul>  <ul style="list-style-type: none"> <li>Remind the class how this process can be done as a written calculation in columns.</li> </ul> <div> <math display="block">\begin{array}{r} 684 \\ - 268 \\ \hline 32 \quad (\text{to } 300) \\ 300 \quad (\text{to } 600) \\ 84 \quad (\text{to } 684) \\ \hline 416 \end{array}</math> </div> <ul style="list-style-type: none"> <li>Emphasise the need to align numbers in the correct columns.</li> <li>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.</li> <li>Ask the children to practise further examples by choosing pairs of numbers, one from each set on the board.</li> </ul>	<ul style="list-style-type: none"> <li>Invite the children, in pairs, to discuss the methods they would use for each of the following:  <math>261 - 258</math>  <math>261 - 204</math>  <math>261 - 241</math>  <math>261 - 232</math></li> <li>Take feedback and establish that different strategies are used, depending on the numbers being subtracted.</li> </ul> <div>Q Is a column method needed for any of these?</div> <div>Q What about <math>746 - 387</math>?</div> <p>Establish that this is a more difficult subtraction to do mentally and that a written column method might be useful.</p> <div>By the end of the lesson the children should be able to:</div> <ul style="list-style-type: none"> <li>Use a written column method to find the difference between two three-digit numbers.</li> </ul> <p>(Refer to supplement of examples, section 6, page 50.)</p>
VOCABULARY total		VOCABULARY subtract difference counting up column strategy operation		

Planning sheet	Day Two	Unit 3 <i>Addition and subtraction 2</i>	Term: <i>Summer</i>	Year Group: 4
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"> <li>Ask the children to each think of a number less than 20.</li> </ul> <div>Q Is your number odd or even?</div> <div>Q How do you know?</div> <p>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.</p> <ul style="list-style-type: none"> <li>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.</li> <li>Ask them now to think of an even number between 100 and 1000. Take examples and reinforce as before.</li> <li>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.</li> </ul>	<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"> <li>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.</li> </ul> <div>Q Is the answer odd or even?</div> <div>Q When two odd numbers are added, will the answer always be even?</div> <div>Q How could we find out?</div> <p>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.</p> <ul style="list-style-type: none"> <li>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;</li> </ul> <p>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.</p> <ul style="list-style-type: none"> <li>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.</li> <li>Complete the answers in the list of properties. Leave on display for reference.</li> </ul>	<ul style="list-style-type: none"> <li>Write some calculations on the board, some of which can be seen to be incorrect using properties of odd and even numbers, e.g. <math>437 + 25 = 463</math>; <math>860 - 328 = 532</math>; <math>58 + 76 = 136</math>; <math>852 - 485 = 367</math>; <math>683 - 275 = 409</math>. Ask the children to identify which of them are definitely incorrect by using the list of properties on display.</li> </ul> <div>Q Can we be sure that all the others are correct?</div> <ul style="list-style-type: none"> <li>Ask the children to give their reasoning. Use an example, <math>58 + 76</math>, 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.</li> </ul> <div> <p><b>By the end of the lesson the children should be able to:</b></p> <ul style="list-style-type: none"> <li><b>Add and subtract pairs of numbers less than 1000 using written column methods where needed;</b></li> <li><b>Use knowledge of sums and differences of odd and even numbers to indicate incorrect results.</b></li> </ul> <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: 4
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 <math>\times 2</math>, <math>\times 3</math>, <math>\times 4</math>, <math>\times 5</math>, <math>\times 10</math> 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"> <li>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.</li> <li>Show seven 5p pieces, and ask for the total.</li> </ul> <div>Q How many more do I need to make £1.00?</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"> <li>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 £6.47 + £3.38 on the board.</li> </ul> <div>Q How could we use a written column method to work out the total?</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 £3.68 + 87p 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"> <li>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.</li> <li>Repeat with finding differences between amounts of money, using the counting up method set out in columns as covered on day 1.</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Discuss the activity and deal with any misconceptions.</li> <li>Agree the prices for the reduced items.</li> </ul> <div>Q Which two toys together cost less than £10?</div> <div>Q How much change from £10 would there be?</div> <p>Establish the appropriate pairs of toys and the amount of change.</p> <div> <p><b>By the end of the lesson the children should be able to:</b></p> <ul style="list-style-type: none"> <li><b>Use written methods for column addition and subtraction of amounts of money.</b></li> </ul> <p>(Refer to supplement of examples, section 6, pages 48, 50.)</p> </div>

Planning sheet	Day Four	Unit 3 <i>Addition and subtraction 2</i>	Term: <i>Summer</i>	Year Group: 4
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions
<p>Use all four operations.</p> <p>Identify which operation is needed.</p> <p>VOCABULARY add subtract multiply divide and associated vocabulary for the above operation</p> <p>RESOURCES Whiteboards</p>	<ul style="list-style-type: none"> <li>Ask a variety of quick oral questions for the children to work out mentally then show answers using whiteboards. Use a variety of appropriate vocabulary, e.g. 13 plus 8, 36 subtract 24, the product of 30 and 2, 1500 divided by 10, etc.</li> </ul> <p>Write 'empty box' statements for children to show missing operations, e.g.</p> <p>25 <math>\square</math> 3 = 75</p> <p>368 <math>\square</math> 99 = 269</p> <p>3600 <math>\square</math> 100 = 36</p> <p>253 <math>\square</math> 126 = 379, etc.</p>	<p>Choose appropriate ways of calculating (mental, mental with jottings, pencil and paper). Check results of calculations, including using knowledge of sums and differences of odd and even numbers.</p> <p>VOCABULARY mental method written method column jottings</p> <p>RESOURCES Resource sheet 3.2 Checking results</p>	<ul style="list-style-type: none"> <li>Discuss that the children have been practising written methods for addition and subtraction in recent lessons, as well as using strategies for mental calculations. Remind them that working mentally is the best way to work if possible, but written methods are needed when calculations are difficult to do mentally. Remind them that sometimes jottings can help to keep track of mental calculations, especially with larger numbers or several numbers. Show an example, e.g. for 253 + 321 record (553) 574, explaining that you added 300, wrote the result to help you remember, then added 21.</li> <li>Set a variety of addition and subtraction calculations for the children to work out mentally, mentally with jottings, or by using a written column method.</li> </ul> <p>Q Which calculations did you work out entirely in your head?</p> <ul style="list-style-type: none"> <li>Take feedback.</li> </ul> <p>Q How did you work it out?</p> <p>For each suggestion ask the children to explain the strategy they used. Repeat with any which involved jottings, then with written methods. N.B. Do not discuss results at this stage.</p> <ul style="list-style-type: none"> <li>Use Resource sheet 3.2 (as an OHT, enlarged or copied for pairs to share). Remind the class about the rules they found for sums and differences of odd and even numbers and display the list made on day 2. Discuss the calculations and the checking methods with the class (the 'further checks' involve adding in a different order or checking subtraction with addition). Establish that odd/even rules find wrong answers quickly, then other checks are made on the remaining calculations.</li> <li>Ask the children to check the calculations they did earlier, first using odd/even rules. They should deal with any incorrect results they find, then go on to check the remaining calculations using an appropriate method.</li> </ul>	<ul style="list-style-type: none"> <li>Provide a context, e.g. a school has room for 560 chairs in the hall. It has sold 382 tickets for a concert. How many more tickets can it sell?</li> </ul> <p>Q What do we need to do to work this out?</p> <p>Establish that 560 – 382 has to be calculated. Ask the children to do the calculation, then ask for the answer.</p> <p>Q How could we check that the answer is correct?</p> <p>Discuss and try out suggestions.</p> <ul style="list-style-type: none"> <li>Discuss the implications for calculation errors in the above and other real life situations. Emphasise the importance of checking results.</li> </ul> <p>HOMEWORK – Using a sheet of paper on which four amounts of money have been written, the children find all combinations of pairs of amounts. They work out the total for each and then the difference between them, using any appropriate method. Finally, they find the total of the four given amounts.</p> <p><b>By the end of the lesson the children should be able to:</b></p> <ul style="list-style-type: none"> <li>Use knowledge of sums or differences of odd and even numbers to check results;</li> <li>Choose appropriate ways of calculating, using mental methods as a first resource.</li> </ul> <p>(Refer to supplement of examples, section 6, page 72, 74.)</p>

Planning sheet	Day Five	Unit 3 <i>Addition and subtraction 2</i>	Term: <i>Summer</i>	Year Group: 4
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions
<p>Recall multiplication and division facts in <math>\times 6</math> and <math>\times 8</math> tables.</p> <p>Use all four operations.</p> <p>VOCABULARY doubling multiplied by time product how many... make... divided by shared between operation</p>	<ul style="list-style-type: none"> <li>Ask the class to count in 6s to 60 then 8s to 80.</li> </ul> <div>Q What is an easy way to multiply by 6? 8?</div> <p>Establish doubling <math>\times 3</math> or <math>\times 4</math>.</p> <ul style="list-style-type: none"> <li>Ask quick fire questions on multiplication and division facts for <math>\times 6</math> and <math>\times 8</math>. The children say the answer together on your signal.</li> <li>Provide a target number and ask the children to write as many number facts as they can with that number as the answer in five minutes. They should include at least one example of each operation.</li> <li>Take feedback briefly, asking for an example for each operation.</li> </ul>	<p>Use all four operations in word problems involving 'real life' and money using one or more steps.</p> <p>Choose appropriate number operations and appropriate ways of calculating to solve problems.</p> <p>RESOURCES Activity sheet 3.1</p>	<ul style="list-style-type: none"> <li>Using the amounts of money set as homework, give an answer to one of the calculations and ask the children to identify the question, checking their own answer. Ask a child to read out a different answer. If correct, the children identify the question and check their answer. Repeat with a few more answers.</li> <li>Write a division calculation on the board, e.g. <math>72 \div 8 = 9</math>. Give a 'story question' context for which the calculation would be used, e.g. eight boxes hold 72 tins of food. How much does each box hold? Ask the children to think of other contexts for the same calculation. Take feedback and discuss.</li> <li>Write <math>72 + 8 = 80</math>, <math>72 - 8 = 64</math>, <math>72 \times 8 = 576</math> on the board. Ask the children to write a 'story question' for each.</li> <li>Ask a child to read out one of their questions. The rest of the class identify the calculation to which it relates. Repeat until all calculations have been used.</li> <li>Set word problems for the children to solve, such as those provided on Activity sheet 3.1. Remind them to identify the calculation required and work it out in a way which is appropriate for the numbers involved.</li> </ul>	<ul style="list-style-type: none"> <li>Discuss the problem-solving activity and any misconceptions which were evident.</li> <li>Ask a volunteer to read out the answer to the first problem, making sure it relates to the context of the question. Ask them to explain how they worked out the answer. Repeat with the other problems.</li> </ul> <div> <p><b>By the end of the lesson the children should be able to:</b></p> <ul style="list-style-type: none"> <li>Use all four operations to solve word problems;</li> <li>Identify and use appropriate operations and ways of calculating to solve problems.</li> </ul> <p>(Refer to supplement of examples, section 6, pages 72, 82, 84.)</p> </div>

			
£6.41	£7.05 £1.41 off	£5.76	£4.88
			
£8.24 £1.65 off	£5.39	£7.68	£2.26 45p off
			
		£6.35	£8.37 £1.68 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 \\  11  \end{array}  $	even + odd = odd	$  \begin{array}{r}  348 \\  + 563 \\  \hline  911 \\  11  \end{array}  $	X
$  \begin{array}{r}  653 \\  - 487 \\  \hline  23 \text{ (to 500)} \\  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	$  \begin{aligned}  119 + 69 &= 120 + 69 \\  &= 189 - 1 \\  &= 188  \end{aligned}  $	✓



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?