

Unit 12
Addition and subtraction
Time

Five daily lessons

National
Numeracy Strategy

Year 4
Autumn term

Unit Objectives
Year 4

- Consolidate understanding of the relationship between addition and subtraction.
- Find a small difference by counting up.
- **Develop and refine written methods for column addition and subtraction of two whole numbers less than 1000.**
- Read the time from an analogue clock to the nearest minute, and from a 12-hour digital clock.
- Use addition and subtraction to solve word problems involving time.

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Page 40

Page 48, 50

Page 100

Page 88, 98

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:

- Activity sheet 12.1
- Activity sheet 12.2
- OHT 12.1
- Addition grid
- Subtraction grid
- Counting stick
- Large teaching clock
- Small clocks
- Page from TV guide
- Digital clock

Year 3

Link Objectives

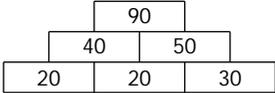
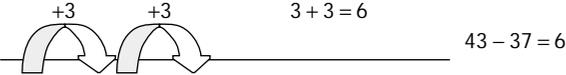
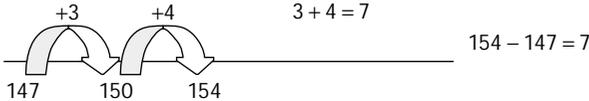
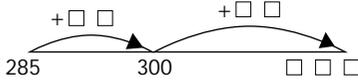
Year 5

- Extend understanding that subtraction is the inverse of addition.
- Find a small difference by counting up from the smaller to the larger number.
- Use informal paper and pencil methods to support, record or explain addition / subtraction.
- Read time to 5 minutes on an analogue clock.
- Solve word problems involving time.

- **Extend written methods to column addition / subtraction of two integers less than 10 000.**
- Find differences by counting up through next multiple of 10, 100 or 1000.
- Use units of time; read the time on a 24-hour digital clock and use 24-hour clock notation.
- **Use all four operations to solve word problems involving time.**

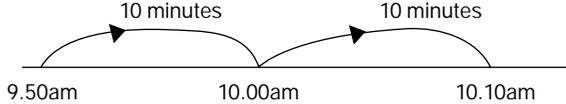
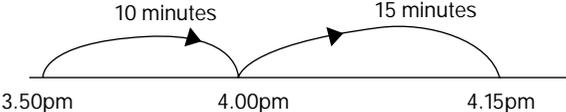
(Key objectives in bold)

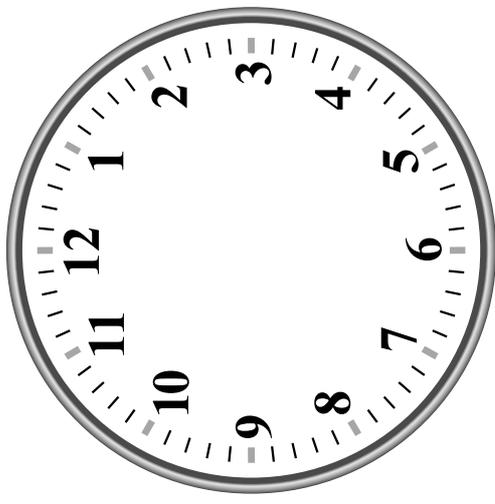
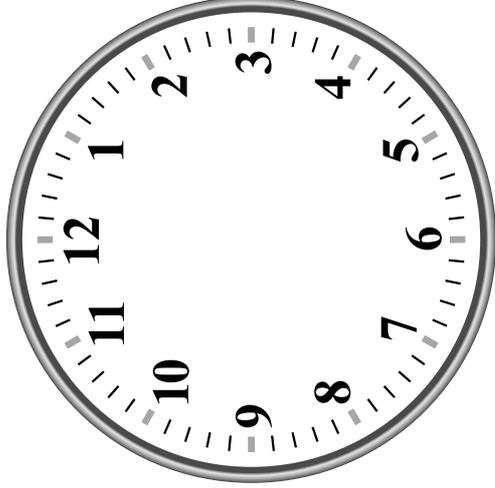
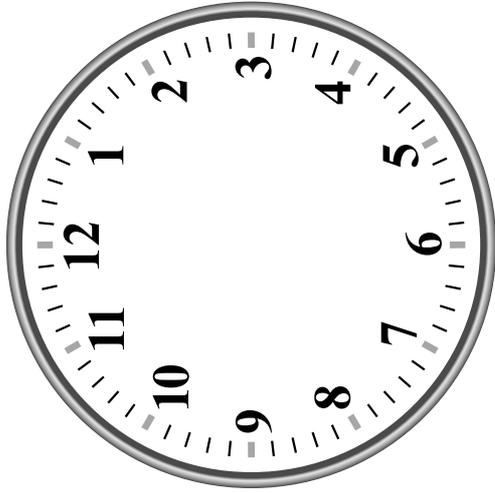
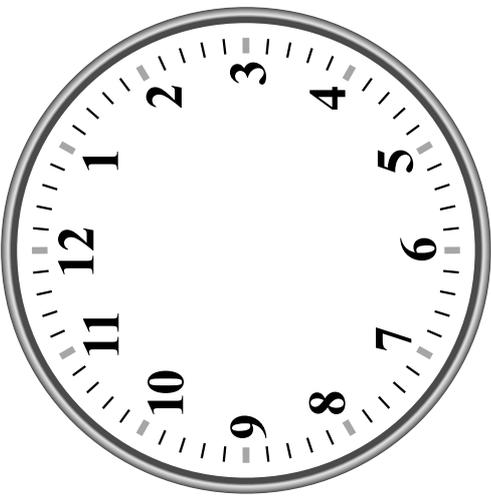
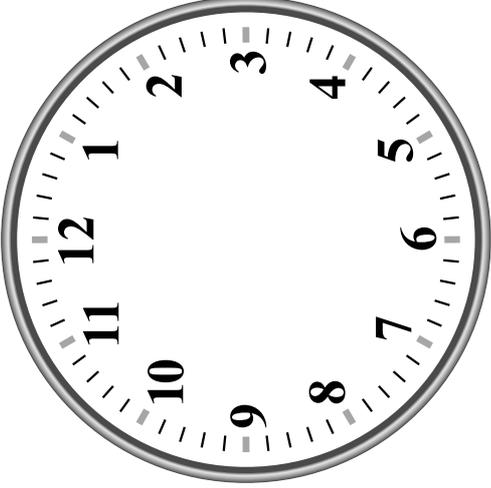
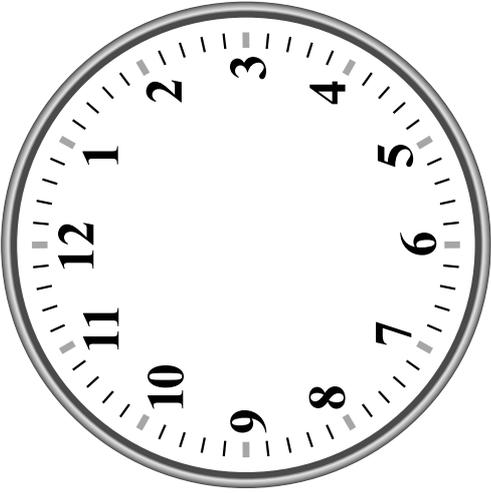
Planning sheet	Day One	Unit 12 <i>Addition and subtraction – Time</i>	Term: <i>Autumn</i>	Year Group: <i>4</i>																																
Oral and Mental		Main Teaching		Plenary																																
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities / Focus Questions																																
<p>Use knowledge that addition can be done in any order to do mental calculations more efficiently.</p> <p>VOCABULARY total sum subtract minus</p>	<ul style="list-style-type: none"> Write several additions with more than two numbers on the board and work through each with the children. <table style="margin-left: 40px; border: none;"> <tr> <td>$19 + 23 + 11$</td> <td>$12 + 14 + 12$</td> </tr> <tr> <td>$= 19 + 11 + 23$</td> <td>$= \text{double } 12 + 14$</td> </tr> <tr> <td>$= 30 + 23$</td> <td>$= 24 + 14$</td> </tr> <tr> <td>$= 53$</td> <td>$= 38$</td> </tr> </table> <p>Set other additions for the children to do.</p> Write these numbers on the board. <table style="margin-left: 40px; border: none;"> <tr> <td>20</td> <td>25</td> <td>18</td> <td>13</td> </tr> <tr> <td>8</td> <td>12</td> <td>27</td> <td>75</td> </tr> <tr> <td>29</td> <td>33</td> <td>5</td> <td>10</td> </tr> </table> <p>Ask the children to choose two numbers to add together in their heads. Which were easy? Why? Now repeat for three-number addition.</p> 	$19 + 23 + 11$	$12 + 14 + 12$	$= 19 + 11 + 23$	$= \text{double } 12 + 14$	$= 30 + 23$	$= 24 + 14$	$= 53$	$= 38$	20	25	18	13	8	12	27	75	29	33	5	10	<p>Consolidate understanding of relationship between addition and subtraction.</p> <p>VOCABULARY increase decrease inverse</p>	<ul style="list-style-type: none"> Present the problem: I'm thinking of a number. If I add 11 to my number, I get 19. What is my number? <div style="border: 1px solid black; padding: 5px; margin: 5px 0;">Q What did you do to find my number?</div> <p>Discuss responses. Draw attention to the use of addition and subtraction as inverse operations. Ask similar questions and talk about how to answer them, e.g. 14 more than my number is 27. What is my number? 19 less than my number is 14. What is my number? If I increase my number by 26 and get 53, what is my number? If I decrease my number by 32 and get 51, what is my number?</p> Ask children to pose similar questions to a partner. <div style="border: 1px solid black; padding: 5px; margin: 5px 0;">Q Which questions were easier / harder? Why?</div> Using one of the examples above, demonstrate to the children the related facts that can be derived <table style="margin-left: 40px; border: none;"> <tr> <td>$51 + 32 = 83$</td> <td>$32 + 51 = 83$</td> </tr> <tr> <td>$83 - 32 = 51$</td> <td>$83 - 51 = 32$</td> </tr> </table> <p>Ask the children to give the related facts for:</p> <table style="margin-left: 40px; border: none;"> <tr> <td>$84 + 17 = 101$</td> <td>$76 + 74 = 150$</td> </tr> <tr> <td>$38 - 26 = 12$</td> <td>$97 - 69 = 28$</td> </tr> </table> <p>Remind children that inverse operations and related facts can be used to check calculations. Give some calculations and ask children to work out which are correct, e.g.</p> <table style="margin-left: 40px; border: none;"> <tr> <td>$47 + 17 = 54$</td> </tr> <tr> <td>$42 - 18 = 24$</td> </tr> <tr> <td>$45 + 16 = 61$</td> </tr> <tr> <td>$54 - 19 = 35$</td> </tr> </table> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;">Q How are you working out if these calculations are correct?</div> 	$51 + 32 = 83$	$32 + 51 = 83$	$83 - 32 = 51$	$83 - 51 = 32$	$84 + 17 = 101$	$76 + 74 = 150$	$38 - 26 = 12$	$97 - 69 = 28$	$47 + 17 = 54$	$42 - 18 = 24$	$45 + 16 = 61$	$54 - 19 = 35$	<p>Write a missing number calculation on the board, e.g. $\square - 28 = 54$</p> <p>Challenge children to write all the related facts with the missing number box in them, e.g. $54 + 28 = \square$</p> <p>Establish 82 as the missing number.</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;">Q How does knowing the related facts help us to solve missing number calculations?</div> <p>HOMEWORK – 30, 17, 13, 43, 50, 80. Give the children these numbers. Ask them to choose three numbers each time and write a calculation and its three related facts.</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>By the end of the lesson the children should understand that:</p> <ul style="list-style-type: none"> Addition is the inverse of subtraction and that they can use this to check results. <p>(Refer to supplement of examples, section 6, page 42.)</p> </div>
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Planning sheet	Day Two	Unit 12 <i>Addition and subtraction – Time</i>	Term: <i>Autumn</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>Consolidate understanding of the relationship between addition and subtraction.</p> <p>RESOURCES Sets of cards with multiples of 10 (up to 300) printed on them</p>	<p>Q Can you identify what is happening on the wall?</p> <div style="text-align: center;">  </div> <p>Ask the children to explain the method they used to add together 40 and 50. Establish that knowing the number facts is important for instance if you know that $4 + 5 = 9$, then $40 + 50 = 90$.</p> <ul style="list-style-type: none"> Divide the class into two teams and play decade tennis. Demonstrate with a child in front of the class. Shuffle the decade cards and turn over the top number, e.g. 30. A player from the second team turns over their top card, e.g. 50 and says the total (80). A player from the first team turns over the next card, e.g. 60 and works out the new total, 140. This is continued until 400 is passed. The team that passes 400 wins that round. <p>Distribute decade cards to groups of four children, who make up teams of pairs. Play again if time.</p>	<p>Find a small difference by counting up. Record their methods more formally.</p> <p>VOCABULARY count up / back difference subtraction</p> <p>RESOURCES Homework numbers from previous lesson</p>	<ul style="list-style-type: none"> Write the homework numbers from the previous lesson on the board. Ask the children their sets of four related calculations. <p>Q How did you decide which three numbers to use each time?</p> <p>Discuss strategies.</p> <p>Q Have we found all the possible calculations?</p> <p>Invite children to explain their reasoning.</p> <ul style="list-style-type: none"> Ask the children to work out the following calculations mentally: $43 - 37$, $102 - 98$, $154 - 147$, $3005 - 2997$ <p>Discuss the proximity of each pair of numbers.</p> <ul style="list-style-type: none"> Show the mental process using a number line and jottings, e.g. $43 - 37$ <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <p>Explain that a good strategy to use with numbers close together is to jump to the nearest 10 or 100 first. Ask children to make up some questions using numbers either side of a decade. Emphasise that 'counting up' is generally easier than 'counting back'. Discuss the merits of 'counting up' and 'back'. Include some with small differences, include numbers with three digits and four digits.</p> <ul style="list-style-type: none"> Explain that this strategy can also be used with numbers which are not so close together, e.g. <div style="text-align: center;">  </div> <ul style="list-style-type: none"> Demonstrate another example, e.g. $654 - 578$. Provide similar calculations for children to do. Ask children to record using a blank number line until they feel confident. 	<ul style="list-style-type: none"> Write a selection of subtraction calculations on the board, some with a small difference and some with a greater difference. Point to each in turn and ask the children to decide if they would use mental or a number line method to find the answer. <p>Q What is it about the numbers that made you decide to use a mental method or a number line?</p> <p>Q Do you always need to use a number line when the numbers are a long way apart? Why not?</p> <p>Q Can you give me a subtraction calculation that you would do mentally/with a number line?</p> <ul style="list-style-type: none"> Write on the board $\square \square \square - 285 = 39$ <div style="text-align: center;">  </div> <p>Challenge the children to work in pairs to find the missing number. Invite children to share their answers and methods.</p> <p>By the end of the lesson children should be able to:</p> <ul style="list-style-type: none"> Calculate mentally, e.g. $42 - 38$, $133 - 125$ using a 'counting up' method; Begin to record their methods for subtraction more formally. <p>(Refer to supplement of examples, section 6, page 50.)</p>

Planning sheet	Day Three	Unit 12 <i>Addition and subtraction – Time</i>	Term: <i>Autumn</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>Find small differences by counting up to a given multiple of ten or 100.</p> <p>RESOURCES OHT 12.1</p>	<p>Use the OHT 12.1:</p> <p>Point to a number on the grid and ask the children to state the complement to a given multiple of 10, e.g. Point to 27.</p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;">Q How many more do I need to make 50, 100?</div> <p>Point to 479.</p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;">Q How many more do I need to make 500?</div>	<p>Develop written methods for subtraction.</p> <p>VOCABULARY minus subtract</p> <p>RESOURCES Whiteboards</p>	<ul style="list-style-type: none"> Remind the children of how to use the written method for subtraction using a 'counting up' method for $586 - 495$. Extend to calculations which may require more than two adding on steps, e.g. $542 - 187$ and allow children time to practise. Show how to record the calculation vertically. Explain and compare with working on the empty number line. <div style="text-align: right; margin: 10px 0;"> $\begin{array}{r} 542 \\ - 187 \\ \hline + 13 \quad (\text{to make } 200) \\ + 300 \quad (\text{to make } 500) \\ + 42 \quad (\text{to make } 542) \\ \hline 355 \end{array}$ </div> <p>Give the children examples to consolidate the recording of counting up methods (complementary addition). Children work individually. Collect answers and check the children's methods.</p> <ul style="list-style-type: none"> Ask one child to demonstrate to the rest of the class. Ask another child to check using addition. Present children with a range of questions written in different ways to consolidate subtraction skills, e.g. Find the difference between 671 and 58. <div style="border: 1px solid black; padding: 2px; margin: 5px 0;">Q How many fewer than 518 is 46?</div> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;">Q What is 365 minus 139?</div> <p>Note: The school will have an agreed policy on which expanded method of subtraction should be used.</p>	<ul style="list-style-type: none"> Present this problem: There are 149 books on the top shelf. There are 63 books on the bottom shelf. How many more books are there on the top shelf than the bottom shelf? Children work individually on a whiteboard. Collect answers and check methods. <div style="border: 1px solid black; padding: 2px; margin: 5px 0;">Q Why did you choose to use that method?</div> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;">Q Which of these calculations would you use a written method to work out? $12 - 7$, $296 - 290$, $394 - 276$ Why?</div> <p>Repeat for: Sam has 409 dinosaur stickers. He gives 123 stickers to his friend. How many stickers does he have left?</p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"> <p>By the end of the lesson children should be able to:</p> <ul style="list-style-type: none"> Record their subtraction calculations using a written method. <p>(Refer to supplement of examples, section 6, page 50.)</p> </div>

Planning sheet	Day Four	Unit 12 <i>Addition and subtraction – Time</i>	Term: <i>Autumn</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>To read time from analogue clocks to one minute.</p> <p>Use addition and subtraction to solve word problems involving money.</p> <p>VOCABULARY minutes to minutes past half past quarter past quarter to</p> <p>RESOURCES Whiteboards</p>	<ul style="list-style-type: none"> Children record on whiteboards the answers to various questions which build on number line strategies. <div data-bbox="320 373 815 440" style="border: 1px solid black; padding: 2px;"> <p>Q You have a £5 note and spend £2.88 how much change do you have?</p> </div> <div data-bbox="320 459 815 545" style="border: 1px solid black; padding: 2px;"> <p>Q You have a £10 note and spend £6.76 on fruit and vegetables. How much change will you get?</p> </div>	<p>To read time from analogue clocks to the nearest minute.</p> <p>VOCABULARY earlier, later</p> <p>RESOURCES Counting stick Large teaching clock Small clocks Activity sheet 12.1 Activity sheet 12.2 Classroom clock (analogue) Digital clock</p>	<ul style="list-style-type: none"> Introduce 1-minute intervals by questioning with reference to the clock face, e.g. how many minutes between each numbered division on the clock face? What is one minute later than 5 past? ... 20 past? ... 25 to? etc. Again consolidate that 'minutes to' get fewer the nearer they get to the hour. <p>What is two minutes later than ... $\frac{1}{4}$ past, 4 o'clock, 5 to ... ? Repeat with other questions, e.g. what is 1 minute earlier than ... 4 minutes later than ... ? etc.</p> <p>Set the clock to different times; ask the children to say the time to the nearest minute. Give the children a small clock (or Activity sheet 12.1) and Activity sheet 12.2.</p> <ul style="list-style-type: none"> Ask the children to work in pairs. Children read the times on the sheet, set their clocks and compare. Discuss any differences. Identify and correct errors and misunderstandings as the children are working. 	<ul style="list-style-type: none"> Ask the children to look at the classroom clock (analogue), what time is it now? How many minutes before break? lunch? homework? Ask the children to look again at the classroom clock and say the time as both analogue and digital. <p>Explain the difference between analogue and digital clocks. Use a clock face to show how to calculate the time a digital clock would show.</p> <div data-bbox="1827 683 2181 948" style="border: 1px solid black; padding: 5px;"> <p>By the end of the lesson children should be able to:</p> <ul style="list-style-type: none"> Tell the time to one minute; Know the difference between analogue and digital clocks. <p>(Refer to supplement of examples, section 6, page 100.)</p> </div>

Planning sheet	Day Five	Unit 12 <i>Addition and subtraction – Time</i>	Term: <i>Autumn</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>To consolidate the vocabulary related to time.</p> <p>VOCABULARY millennium century</p> <p>RESOURCES Whiteboards</p>	<ul style="list-style-type: none"> By questioning the children build up a table to show: <ul style="list-style-type: none"> 1 millennium = 1 century = 1 year = 1 month = 1 week = 1 day = 1 hour = 1 minute = Write the date on the board in words and numbers. e.g. 23rd March 2002 Ask the children to write the date on a whiteboard in figures only e.g. 23/3/02 23.03.2002 Ask the children to write down the date it will be on their birthday this year, next year and in ten years' time. 	<p>Solve word problems involving time.</p> <p>VOCABULARY count on / back earlier / later than</p> <p>RESOURCES Large teaching clock (analogue) Page from TV guide Digital clock</p>	<ul style="list-style-type: none"> Show how an empty number line can be used to answer questions, e.g. write on board: What is 20 minutes later than 9.50am? Explain the am notation if necessary. Draw empty number line and talk through steps. Show on large teaching clock analogue and digital.  <p>9.50am 10.00am 10.10am</p> <p>Answer 10.10am.</p> <p>Repeat with different example for earlier than.</p> <ul style="list-style-type: none"> Give the children a page from a TV guide and ask them to: <ul style="list-style-type: none"> a) find the length of some programmes of their choice; b) rewrite one channel's listing for 20 minutes earlier. <p>A television programme starts at 3.50pm and finishes at 4.15pm. How long is the programme?</p>  <p>3.50pm 4.00pm 4.15pm</p> <p>Answer 25 minutes.</p> <p>Allow children time to practise finding the lengths of TV programmes using the number line.</p>	<ul style="list-style-type: none"> Draw a table to show the times of buses. 8.00am 10.30am 1.00pm 3.30pm 5.00pm Q You are at the bus stop at 2.50pm. How long do you wait for the next bus? Q The 10.30am bus is 35 minutes late. What time does it arrive? Q How long is it between the first and last bus? Challenge the children to pose extra questions. Discuss methods for finding answers. Encourage children to visualise time line / clock. <p>By the end of the lesson children should be able to:</p> <ul style="list-style-type: none"> Find times earlier / later than a given time; Use the timings in a television guide to work out how long a favourite television programme will last. <p>(Refer to supplement of examples, section 6, pages 88, 98 and 100.)</p>



12 minutes past 4

8 minutes to 11

23 minutes to 5

29 minutes past 10

17 minutes to 9

6 minutes past 6

11 minutes to 8

18 minutes past 2

3 minutes past 9

27 minutes to 7

22 minutes past 4

2 minutes to midnight

479	143	19	127
498	20	39	135
27	40	23	67
87	74	143	503