

Unit 9
Ordering, addition and subtraction and 'real life' problems

Five daily lessons

Primary
National Strategy

Year 2
Summer term

Unit Objectives
Year 2

Order whole numbers to at least 100, and position them on a number line and 100 square.
Understand that subtraction is the inverse of addition (subtraction reverses addition).
 Add/subtract 9 or 11: add/subtract 10 and adjust by 1. Begin to add/subtract 19 or 21: add/subtract 20 and adjust by 1.
 Use known number facts and place value to add/subtract mentally.
 Bridge through 10 or 20, then adjust.
Choose and use appropriate operations and calculation and efficient calculation strategies (e.g. mental, mental with jottings) **to solve problems.**
Explain how a problem was solved orally and, where appropriate, in writing.
 Use mental addition and subtraction, simple multiplication and division, to solve simple word problems involving numbers in 'real life', money or measures, using one or two steps. Explain how the problem was solved.

Page 15

Pages 25, 29
 Page 35

Pages 37, 39
 Page 41
 Page 61

Page 65
 Pages 67, 69, 71

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 9.1
- Activity sheet 9.2
- Activity sheet 9.3
- OHT 9.1
- OHT 9.2
- OHT 9.3
- OHT 9.4
- OHT 9.5
- Digit cards
- Whiteboards
- Large 0-100 number line

Also see Models and Images charts:
 Ordering numbers to 100;
 Understanding addition and subtraction.

Link Objectives

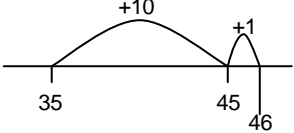
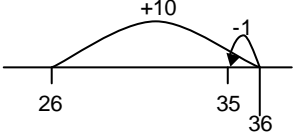
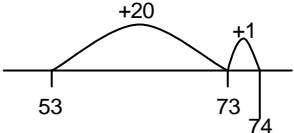
Year 1

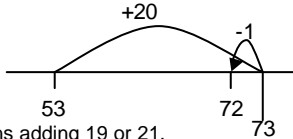
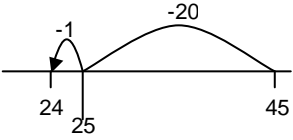
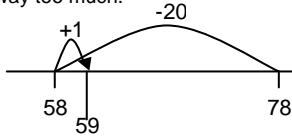
Year 3

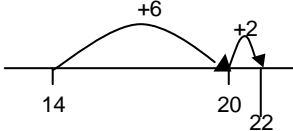
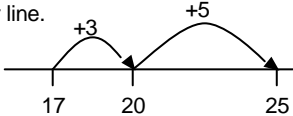
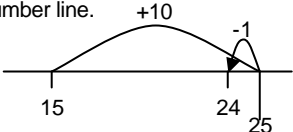
Order whole numbers to at least 20, and position them on a number track.
Understand the operation of addition and of subtraction (as 'take away', 'difference' and 'how many more to make') and use the related vocabulary.
 Use known number facts and place value to add/subtract a pair of numbers mentally within the range 0 to at least 10, then 0 to at least 20.
 Add 9 to a single digit number by adding 10 then subtracting 1. Begin to bridge through 10 and later 20 when adding a single-digit number.
 Choose and use appropriate number operations and mental strategies to solve problems.
Use mental strategies to solve simple problems set in 'real life', money or measures contexts, **using counting, addition, subtraction, doubling and halving, explaining methods and reasoning orally.**

Order whole numbers to at least 1000, and position them on a number line. Extend understanding of the operations of addition and subtraction, read and begin to write the related vocabulary, and continue to recognise that addition can be done in any order. Use the +, - and = signs.
 Use known number facts and place value to add/subtract mentally.
Add/subtract mentally a 'near multiple of 10' to or from a two-digit number... by adding or subtracting 10, 20, 30... and adjusting.
 Bridge through a multiple of 10, then adjust.
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', money or measures, using one or two steps, including finding totals and giving change, and working out which coins to pay. Explain how the problem was solved.

(Key objectives in bold)

Planning sheet	Day One (page 1 of 2)	Unit 9 Ordering, addition and subtraction and 'real life' problems	Term: Summer	Year Group: 2
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/ Focus Questions
<p>Order whole numbers to at least 100.</p> <p>VOCABULARY smallest least largest greatest</p> <p>RESOURCES Whiteboards Large 0–100 number line</p>	<p>Write 50, 25 and 2 on the board. Ask the children to order these numbers on their whiteboards starting with the smallest number.</p> <p>Ask them to draw on their whiteboards an empty number line with 0 at one end, 100 at the other and mark the position of the three ordered numbers.</p> <p>Q How did you work out where to put the numbers?</p> <p>Point to these numbers on the number line.</p> <p>Repeat the activity using 49, 60 and 16. Draw attention to how important it is to say each number clearly.</p> <p>Repeat the activity using four numbers, e.g. 18, 21, 12, 81.</p>	<p>Extend understanding of addition and subtraction.</p> <p>Add/subtract 19 or 21 by adding 20 then adjusting.</p> <p>VOCABULARY add subtract strategy mental calculation</p> <p>RESOURCES Whiteboards</p>	<p>Write on the board $35 + 11$ and $26 + 9$. Ask the children if they remember the strategy we learned for these calculations. Ask them to work these out and share them with a partner.</p> <p>Record: $35 + 11$ $35 + 10 = 45$ $45 + 1 = 46$</p> <p>Q Why did we add 10 first and then add 1?</p> <p>Agree that 11 is 10 and 1, and we can add 10 very quickly. Show this on a number line.</p>  <p>Record: $26 + 9$ $26 + 10 = 36$ $36 - 1 = 35$</p> <p>Q Why did we add 10 then subtract 1?</p> <p>Draw out that when we added on 10, we added on 1 too many so we need to subtract the 1. Show this on a number line.</p>  <p>Tell the children we are going to use a similar strategy for adding 21 and 19.</p> <p>Write on the board $53 + 21$</p> <p>Ask the children to tell their partner how they might work it out. Draw out the strategy of adding 20 and then adding 1.</p> <p>Q How do we add 20?</p> <p>Emphasise that counting on 2 tens is an easy way to add 20.</p> <p>Record: $53 + 21$ $53 + 20 = 73$ $73 + 1 = 74$</p> <p>Show this on a number line.</p>  <p>Try other similar calculations.</p> <p>Write on the board $53 + 19$. Ask the children to tell their partner how they might work it out. Draw out the strategy of adding 20 and then subtracting 1 as we have added an extra 1 which we must subtract.</p>	<p>Write on the board $75 + 19 = 94$. Ask the children to draw the calculation on an empty number line.</p> <p>Q Why do we subtract 1 even though this is an addition question?</p> <p>Show this on a number line.</p> <p>Write on the board $66 - 19 = 47$. Ask the children to draw the calculation on an empty number line.</p> <p>Q Why do we add 1 even though this is a subtraction question?</p> <p>Show this on a number line.</p> <p>Q How might you add 29?</p> <p>By the end of the lesson, children should be able to:</p> <p>mentally add or subtract 19 or 21 to/from any two-digit number.</p> <p>(Refer to supplement of examples, section 5, page 35.)</p>

Planning sheet	Day One (page 2 of 2)	Unit 9 <i>Ordering, addition and subtraction and 'real life' problems</i>	Term: <i>Summer</i>	Year Group: 2
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions
			<p>Record: $53 + 19$ $53 + 20 = 73$ $73 - 1 = 72$ Show this on a number line.</p>  <p>Work through similar calculations adding 19 or 21.</p> <p>Ask the children to make up two calculations adding 21 to a two-digit number and two calculations adding 19 to a two-digit number and record them.</p> <p>Write on the board $45 - 21$.</p> <p>Q How could you work this out?</p> <p>Ask them to work it out and share how they did this with a partner. Discuss their methods and record: $45 - 21$ $45 - 20 = 25$ $25 - 1 = 24$</p> <p>Q Why do you subtract 20? Why do you subtract 1?</p> <p>Agree that 20 is an easy number to subtract but that then you need to subtract an extra 1. Show this on a number line.</p>  <p>Try other similar calculations.</p> <p>Write on the board $78 - 19$ Ask the children to work this out with a partner. The children may find this more difficult and may need careful discussion supported by number lines. $78 - 20 = 58$ $58 + 1 = 59$ say that you add 1 because you took away too much.</p> <p>Show this on a number line.</p>  <p>Q Why do you subtract 20? Why don't you subtract 1?</p> <p>Draw out that then you would have subtracted 21 altogether, which is too much. Show this on a number line. Repeat with $67 - 19$ $67 - 20 = 47$ $47 + 1 = 48$</p> <p>Ask the children to make up two calculations subtracting 19 from two-digit numbers. Ask them to record the calculations and also show them on number lines.</p>	

Planning sheet	Day Two	Unit 9 <i>Ordering, addition and subtraction and 'real life' problems</i>		Term: <i>Summer</i>	Year Group: 2
Oral and Mental		Main Teaching			Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions	
<p>Know by heart all pairs of numbers with a total of 10.</p> <p>Know by heart all pairs of numbers with a total of 20.</p> <p>VOCABULARY pair total</p> <p>RESOURCES Digit cards</p>	<p>Hold up a digit card with 8 on it.</p> <p>Q Which other number added to 8 makes 10?</p> <p>Ask children to respond using digit cards.</p> <p>Ask other similar questions, building up speed.</p> <p>Repeat using pairs to 20, encouraging the children to see the connection with the pairs to 10.</p> <p>Q What do you notice about 6 + 10 and 6 + 20 ?</p> <p>Emphasise that as 20 is 10 bigger than 10, so is the number we add.</p> <p>Q What do you notice about 7 + 10 and 16 + 20 ?</p>	<p>Bridge through 10 or 20, then adjust.</p> <p>Choose efficient calculation strategies.</p> <p>VOCABULARY calculation strategy partition</p> <p>RESOURCES Activity sheet 9.1</p>	<p>Write on the board: $14 + 8$.</p> <p>Ask the children to discuss how they would do this and record it as a number sentence. Agree that we can use our number facts for multiples of 10:</p> <p>$14 + 8 = 14 + 6 + 2$ $14 + 6 = 20$ $20 + 2 = 22$</p> <p>Show this on a number line.</p>  <p>?? Repeat with $17 + 8$</p> <p>Q How could we partition the 8 to make it easier to do this calculation?</p> <p>Ask the children to record the calculations they do.</p> <p>$17 + 8$ $= 17 + 3 + 5$ $17 + 3 = 20$ $20 + 5 = 25$</p> <p>Show this on a number line.</p>  <p>Repeat with other calculations.</p> <p>Write on the board $15 + 9$.</p> <p>Q Which strategy would you use?</p> <p>Remind the children of the strategies they used on day one to add 10 and adjust. Remind the children that they should always think of the most efficient strategy.</p> <p>Show this on a number line.</p>  <p>Give out and read Activity sheet 9.1 and ask the children to complete it.</p>	<p>Ask the children to explain to a partner how they grouped their calculations. Collect answers and discuss.</p> <p>Write on the board $24 + 8$.</p> <p>Ask the children to visualise the number line and do $24 + 6 = 30$ and $30 + 2 = 32$.</p> <p>Q Why did we partition the 8 into 6 + 2?</p> <p>Agree that it is because we want to use the pairs that make 10, i.e. $24 + 6 = 30$ and that adding onto a multiple of 10 is easy.</p> <p>Repeat with other calculations bridging through multiples of 10.</p> <p>By the end of the lesson, children should be able to:</p> <p>use two steps and cross 20 as a middle stage, for example work out mentally that: $16 + 7 = 23$ and explain that $16 + 7 = 16 + 4 + 3 = 20 + 3 = 23$.</p> <p>(Refer to supplement of examples, section 5, page 41.)</p>	

Planning sheet	Day Three	Unit 9 <i>Ordering, addition and subtraction and 'real life' problems</i>		Term: <i>Summer</i>	Year Group: 2
Oral and Mental		Main Teaching		Plenary	
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions	
<p>Extend knowledge of addition and subtraction.</p> <p>VOCABULARY add plus total sum more than less than subtract difference</p> <p>RESOURCES Whiteboards</p>	<p>Draw two columns on the board, one labelled + and one labelled –.</p> <p>Ask: Q What is 3 more than 7?</p> <p>Ask the children to decide whether this question is an addition or a subtraction question, and invite them to write the correct sign on their whiteboards.</p> <p>Write the vocabulary 'more than' under the + sign on the board.</p> <p>Q How could you work this out?</p> <p>Ensure that they all see that there is a pair to 10, 7 and 3.</p> <p>Repeat the activity asking questions such as:</p> <p>Q What is 2 plus 19 and 1 more? Q What is the difference between 14 and 5? Q What is the sum of 13, 5 and 7? Q What is 3 less than 8? Q What is the total of 4, 8 and 16?</p> <p>Each time, write the vocabulary in the correct column on the board.</p>	<p>Choose and use appropriate operations.</p> <p>VOCABULARY partition recombine calculation add</p> <p>RESOURCES OHT 9.1 Whiteboards</p>	<p>Show OHT 9.1. Read the first question through together. Ask the children which operation they would need to solve the problem and to show this operation on their whiteboards.</p> <p>Ask them to discuss with their partner how they decided which operation they needed.</p> <p>Q How do you decide which operation to use?</p> <p>Agree that the words 'another' and 'how much now' suggest addition. Underline these words on the OHT.</p> <p>Ask the children to write the calculation for this problem: $13 + 5$.</p> <p>Ask the children to decide with their partner which words in the second problem tell us which operation is needed. Collect answers and underline the words.</p> <p>Ask the children to write the calculation needed on their whiteboards, i.e. $13 - 5$.</p> <p>Repeat for question 3. Draw attention to the two calculations needed: $£3.50 + £2.50$ and $£10.00 - £6.00$ (or $£10.00 - £3.50$ and $£6.50 - £2.50$).</p> <p>Ask the children to write the calculations needed for the other questions with a partner and then to make up a question of their own.</p> <p>Ask the children to choose two of the questions and work out the answers to them.</p>	<p>Ask two children to record on the board the calculation needed for question 4.</p> <p>Q Could you have written this in a different way? What is the answer to each calculation?</p> <p>Repeat for questions 5 and 6 helping the children to record how they worked it out on the board.</p> <p>Write on the board: $17 + 25 = \dots$</p> <p>Ask the children to say what the missing number is and how they knew.</p> <p>Q How can you check that this is correct?</p> <p>Agree that if you think the answer is 8, you could add 8 onto 17 and see if it makes 25.</p> <p>Repeat with: $10 = 2 + 5 + ?$ $23 - 10$ $20 = 30 - ?$</p> <p>HOMEWORK – Ask the children to make up two calculations with missing numbers. One should be addition and one subtraction. They should put the missing numbers in different places and can put the equals sign in different places too. Give examples. My number sentence is: $14 + 9 = 23$ $23 - 9$ $23 = 14 + ?$ $23 = 9$</p> <p>My second number sentence is: $32 - 19 = 13$ $13 = 32 - ?$ $32 - 19$</p> <p>By the end of the lesson, children should be able to: choose and use appropriate operations and ways of calculating to solve problems; explain and record how a problem was solved.</p> <p>(Refer to supplement of examples, section 5, page 61.)</p>	

Planning sheet	Day Four	Unit 9 <i>Ordering, addition and subtraction and 'real life' problems</i>		Term: <i>Summer</i>	Year Group: 2
Oral and Mental		Main Teaching			Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions	
<p>Order whole numbers to at least 100.</p> <p>VOCABULARY smallest least largest greatest</p> <p>RESOURCES Whiteboards</p>	<p>Look at the homework. Ask the children to share their work with a partner and ask them to work out some of the missing numbers from their partners' number sentences.</p> <p>Share one or two with the class.</p> <p>Write on the board: £2.21p, 48p, 11p, 84p, £3.78, £1.</p> <p>Ask the children to order these amounts from the largest to smallest and write them in order on their whiteboards.</p> <div data-bbox="338 767 607 895" style="border: 1px solid black; padding: 5px;"> <p>Q Which digit do you have to look at first? Does it matter whether it's the pound or the pence?</p> </div> <p>Draw out that £1 is more than 84p even though 1 is less than 8.</p> <p>Write on the board: £3.31, 88p, 65p, £3.13, 56p, £2.</p> <p>Ask the children to order these amounts from the smallest to the largest and write them in order on their whiteboards.</p>	<p>Choose and use appropriate operations and calculation strategies to solve one-step problems and two-step problems.</p> <p>VOCABULARY one-step problem two-step problem calculation strategy</p> <p>RESOURCES OHT 9.2 OHT 9.3 OHT 9.4 Activity sheet 9.2</p>	<p>Display OHT 9.2. Read the question with the class.</p> <div data-bbox="887 300 1749 331" style="border: 1px solid black; padding: 2px;"> <p>Q What is the calculation?</p> </div> <p>Agree it is $68 + 19$.</p> <div data-bbox="887 403 1749 435" style="border: 1px solid black; padding: 2px;"> <p>Q Which strategy would you use? Why?</p> </div> <p>Remind the children of the strategy of adding 20, then subtracting 1. Record this on a number line in the box 'How I worked it out'.</p> <div data-bbox="969 512 1261 647" style="text-align: center;"> </div> <p>Say that this is a useful way to show how they worked out the answer.</p> <p>Write the answer 87p in the last box.</p> <p>Show OHT 9.3. Read the question.</p> <div data-bbox="887 799 1749 831" style="border: 1px solid black; padding: 2px;"> <p>Q What is different about this question?</p> </div> <p>Draw out that you have to do two calculations – add the money and then find the change. Say that this is a two-step question. Work through the sheet together.</p> <p>Look at OHT 9.4.</p> <div data-bbox="887 975 1749 1007" style="border: 1px solid black; padding: 2px;"> <p>Q How would you work out the answer?</p> </div> <p>Draw out that you could work out $6 + 6 + 6$ or 6×3. Fill in the boxes together.</p> <p>Give the children Activity sheet 9.2 and read both questions.</p> <p>Draw out that the first question is a one-step problem whereas the second question is a two-step problem.</p> <p>Ask the children to complete the sheet</p>	<p>Discuss the type of problems looked at in the lesson.</p> <div data-bbox="1783 323 2145 379" style="border: 1px solid black; padding: 5px;"> <p>Q Which problems were one-step and which were two-step?</p> </div> <p>Ask the children to think of a one-step problem to tell their partner. Their partner must say how they would go about it but does not have to work out the answer.</p> <p>Ask the children to think of a two-step problem for their partner to solve. Their partner must say how they would go about it but does not have to work out the answer.</p> <p>Collect some ideas and record the necessary calculations on the board.</p> <div data-bbox="1783 799 2145 1193" style="border: 1px solid black; padding: 10px;"> <p>By the end of the lesson, children should be able to:</p> <p>use mental addition or subtraction, or simple multiplication, and own strategies to solve 'story' problems about numbers in 'real life', choosing the appropriate operation and way to calculate, mental or mental with jottings.</p> <p>(Refer to supplement of examples, section 5, page 67.)</p> </div>	

Planning sheet	Day Five	Unit 9 <i>Ordering, addition and subtraction and 'real life' problems</i>		Term: <i>Summer</i>	Year Group: 2
Oral and Mental		Main Teaching			Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions	
<p>Choose and use appropriate operations.</p> <p>VOCABULARY add subtract multiply divide one-step problem two-step problem</p> <p>RESOURCES OHT 9.5</p>	<p>Show OHT 9.5. Read each question in turn and ask the children to write the sign or signs needed for the calculations on their whiteboards, e.g. they write + for question 1 and + and – for question 3.</p> <p>Q Why did you choose addition? (Q1)</p> <p>Q Why have you written two signs? (Q3)</p> <p>Q Why has Sam written addition and Megan written multiplication? (Q4)</p> <p>Agree that Sam is thinking of repeated addition whereas Megan would multiply.</p> <p>Q Which were one-step problems? And two-step problems?</p>	<p>Choose and use appropriate operations.</p> <p>VOCABULARY strategy operation addition subtraction multiplication altogether</p> <p>RESOURCES Whiteboards Activity sheet 9.3</p>	<p>Write on the board $13 + 19$. Ask the children in pairs to make up a number story to reflect this, e.g. I have 13 marbles and I buy another 19. How many marbles do I have altogether? Choose a number story and write it on the board.</p> <p>Q Which strategy would you use to solve this?</p> <p>Q Why have you chosen this strategy?</p> <p>Ask them to show this strategy on their whiteboards, e.g. $13 + 20 = 33$, $33 - 1 = 32$.</p> <p>Q Which are the important words to show which operation is used?</p> <p>Underline the words.</p> <p>Write on the board 3×4. Ask the children to make up a number story to reflect this, e.g. a tricycle has three wheels. How many wheels are on four tricycles?</p> <p>Q Which strategy would you use to solve this?</p> <p>Draw out drawing hops of 3 on a number line and counting in threes mentally.</p> <p>Q Why have you chosen this strategy?</p> <p>Ask them to show this strategy on their whiteboards.</p> <p>Write on the board: $? - 4 = 18$. Ask the children to work out the missing number.</p> <p>Q Which strategy would you use to solve this?</p> <p>Draw out adding 4 to 18, adding 2 to get to 20, then 2 more.</p> <p>Q How could you check the answer?</p> <p>Draw out putting the answer in the box, and working out the calculation to check it works, e.g. $22 - 4 = 18$. Ask the children to make up a number story to reflect this.</p> <p>$16 - 4$. Ask the children to work out the missing number.</p> <p>Q Which strategy would you use to solve this?</p> <p>Discuss subtracting 4 from 16 as well as counting from 4 to 16.</p> <p>Q How could you check the answer?</p> <p>Ask the children to make up a number story to reflect this.</p> <p>Give out and read Activity sheet 9.3 and ask the children to answer the questions.</p>	<p>Write on the board $24 \times 8 = 32$.</p> <p>Ask the children to decide which operation is needed to make the number sentence correct.</p> <p>Q How do you know it is addition?</p> <p>Encourage the children to answer with a sentence, i.e. this is addition because 24 plus 8 equals 32.</p> <p>Use a calculation strategy such as counting on to check it.</p> <p>Repeat with:</p> <p>$6 = 3 \times 2$</p> <p>$33 = 14 \times 19$</p> <p>$87 \times 9 = 78$</p> <p>$10 \times 2 = 5$</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>By the end of the lesson, children should be able to:</p> <p>choose and use appropriate operations and ways of calculating; make up 'number stories'.</p> <p>(Refer to supplement of examples, section 5, page 61.)</p> </div>	