Unit 2
Addition and subtraction 1

Year 4
Summer term

Five daily lessons

Unit Objectives
Year 4

- Understand the principles (not the name) of the associative law as it applies to addition.

  Page 34

- Add or subtract the nearest multiple of 10 , then adjust.

  Page 40

- **Use known number facts and place value to add or subtract mentally, including any pair of two-digit whole numbers.**

  Pages 44, 46

- **Develop and refine written methods for column addition of two or more whole numbers less than 1000.**

  Page 48

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 2.1
- Resource sheet 2.2
- Activity sheet 2.1
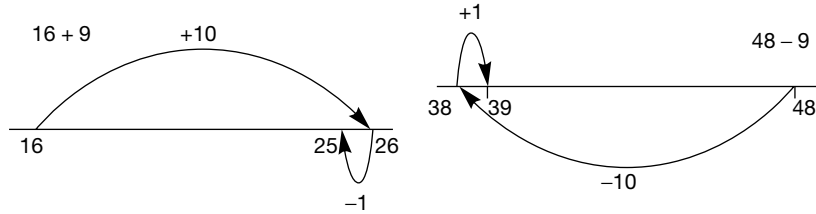- Large hundred square
- Whiteboards
- Large dice

Link Objectives
Year 3

- Extend understanding of the operation of addition, read and be able to write the related vocabulary, and continue to recognise that addition can be done in any order.

- **Add and subtract mentally a 'near multiple of 10' to or from a two-digit number by adding or subtracting 10, 20, 30… and adjusting.**

- Use known number facts and place values to add/subtract mentally.

- Begin to use column addition for HTU and TU where the calculation cannot easily be done mentally.

Year 5

- Add or subtract the nearest multiple of 10 or 100, then adjust.

- Use known number facts and place value for mental addition and subtraction.

- **Extend written methods to column addition of two integers less than 10 000.**

- Addition of more than two integers less than 10 000.

(Key objectives in bold)

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Planning sheet	Day One	Unit 2 *Addition and subtraction 1*		Term: *Summer*	Year Group: *4*

Oral and Mental		**Main Teaching**		**Plenary**
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**	**Teaching Activities/Focus Questions**

Oral and Mental Objectives	Oral and Mental Activities	Main Objectives	Main Teaching Activities	Plenary
Add/ subtract multiples of 10 to/from two- and three-digit numbers.	• Ask the class to count in 20s from zero to 100 and back. Point to the numbers on the hundred square as they count. Repeat, starting from 7. **Q** What happens to the numbers when we count in 20s? Establish that the 10s digits change by 2 and the 1s remain the same because 20 has zero units. Ask the children to count on and back in 20s from different starting points, this time without indicating on the hundred square. Develop to starting from three-digit numbers. • Repeat the above with counting in 30s. • Ask the children to show answers to questions such as the following on whiteboards: $47 + 20$, $68 - 30$, $148 + 20$, $365 - 30$, etc. Discuss methods and correct any errors and misunderstandings. **Q** What do we do when we add or subtract 40, 50 or 70 to any number? Establish that the 4, 5, 7 are added/subtracted to/ from the 10s digit. Ask questions involving adding or subtracting different multiples of 10 to or from two- and three-digit numbers for children to answer using whiteboards. Include questions that involve crossing the hundreds boundary, e.g. $374 + 60$, $625 - 50$.	Add or subtract the nearest multiple of 10, then adjust. VOCABULARY near multiple adjusting RESOURCES Resource sheet 2.1	• Remind the class that an easy way to add or subtract 9 to or from a number is to add or subtract 10, then adjust the answer by 1. Reinforce that when adding, the answer is adjusted by subtracting 1 since an extra 1 has been added, using a number line as shown below. Similarly that when subtracting, the answer is adjusted by adding 1 since 1 more than needed has been subtracted. • Ask the class to count on in 9s from 75. Stop them after about ten steps, then ask them to count back in 9s to 75. Discuss strategies. **Q** What is an easy way to add or subtract 19 to or from a number? Agree it is adding or subtracting 20 then adjusting by 1. Extend to adding or subtracting the nearest multiple of 10 and adjusting. • Provide questions involving adding or subtracting 19, 29, 39…, including crossing the 100 boundary, for the children to answer using whiteboards. • Repeat with adding or subtracting 11, 21, 31… **Q** What is an easy way to add or subtract 18, 28, 58? Establish using the nearest multiple of 10 and adjusting by 2. Provide a few practice examples as above. Repeat with 17, 27, 37, etc. • Relate the strategies to the context of money. Set a problem such as: I bought a bag of apples for 75p and a melon for 69p. How much did they cost altogether? **Q** How can we work this out mentally? Collect answers and jot on the board: $75p + 70p = 145p$ and $145p - 1p = 144p$ Establish that 144p is better expressed as £1.44. Repeat with a problem such as: Melons now cost 85p. How much more do they cost? Give out Resource sheet 2.1 to pairs of children. Explain that it shows prices of items in two different shops. The children should select one price from each list. One child finds the total of the two items, the other finds their difference. They then check each other's answers and discuss any errors. Repeat several times with children changing roles each time.	• Ask the children to explain how any errors they discussed in the paired activity had been made. • Ask the children to choose any nine numbers between 3 and 18 and to write them in a 3×3 array, e.g. Ask questions involving subtracting the nearest multiple of 10 in which the answer falls between 3 and 18, e.g. $64 - 49$. The children cross off any answers which are on their array. Play until a line is deleted. **By the end of the lesson the children should be able to:** • **Add or subtract two-digit numbers ending in 9, 8, 7 or 1 to or from two- and three-digit numbers by adding or subtracting the nearest multiple of 10 and adjusting.** (Refer to supplement of examples, section 6, page 40.)
RESOURCES Large hundred square Whiteboards				

Planning sheet	Day Two	Unit 2 *Addition and subtraction 1*	Term: *Summer*	Year Group: *4*

Oral and Mental

Objectives and Vocabulary	Teaching Activities
Recall addition and subtraction facts for all numbers to 20. Use number facts and place value to add a single-digit number to any three- or four-digit number, including crossing the 10s boundary.	• Ask quick fire addition and subtraction questions to 20 for the children to answer orally. Use a range of addition and subtraction vocabulary. Ask the question, pause for a moment, then name the child to answer (so that all have to work it out), e.g. 8 plus 6… Joe; 17 subtract 8… Anna. Remind the children about the use of strategies if needed, e.g. near doubling, adding/subtracting 4 by adding/subtracting 2 twice, using 10 then adjusting for 7, 8 or 9, etc. • Develop to using addition facts in larger numbers: **Q** What is 6 + 7?; 16 + 7?; 56 + 7?; 576 + 7?; 2836 + 7? Record the questions and answers on the board and discuss how the facts to 20 are used in all the questions. Repeat. Ask a variety of questions involving adding single digits to three- or four-digit numbers for the children to answer orally. Prompt them to think of the addition fact being used and to work that out first if needed.

VOCABULARY
add
plus
increase
total
take away
subtract
decrease
difference
number fact
near doubling
adjusting

Main Teaching

Objectives and Vocabulary	Teaching Activities

Use number facts and place value to add or subtract any pair of two-digit numbers, including crossing the 10s boundary.	• Remind the class that they subtracted single digits from two-digit numbers in previous work. Provide a few examples for practice and reinforcement, e.g. 37 – 5, 24 – 8, 53 – 5, etc. Discuss useful strategies, such as bridging through 10s (e.g. for 53 – 5, use 53 – 3 – 2) or subtracting 7, 8 or 9 by subtracting 10 and adjusting.
	
	• Rehearse strategies for adding and subtracting pairs of two-digit numbers which do not cross the 10s boundary, e.g.
	
	   Q What is 35 + 42?
	
	   Q How did you work it out?
	
	Discuss all methods suggested and focus on those involving partitioning, jot the stages on the board, e.g.
	
	(35 + 42) 30 + 40 + 5 + 2 and (35 + 42) 35 + 40 + 2
	             70 + 7 75 + 2
	             77 77
	
	Repeat with 68 – 23.
	
	• Ask similar questions for the children to show answers using whiteboards. Each time ask a child to explain the method they used.
	
	• Develop to adding and subtracting pairs of two-digit numbers which cross the 10s boundary. Establish the use of partitioning the second number, e.g. for 47 + 34, add 30 to 47, then add 4; for 52 – 36, subtract 30 from 52, then subtract 6.
	
	• Extend to adding any two-digit number to three-digit multiples of 10, e.g. 73 + 420.
	
	• Set a variety of addition and subtraction questions for the children to work out mentally, with and without jottings.

VOCABULARY
partitioning

RESOURCES
Whiteboards

Plenary

Teaching Activities/Focus Questions
• Go through the answers and ask the children to explain their methods. Deal with any misconceptions that have arisen. • Ask the children to write down any five two-digit numbers using digits 4, 5, 6, 7, 8 or 9. In pairs they each choose one of their numbers, add it to that chosen by their partner, then compare answers and discuss strategies used. Repeat with subtraction. Take feedback, focusing on the use of partitioning the second number, and of adding/subtracting the nearest multiple of 10 with appropriate adjustment. HOMEWORK – The children use the five two-digit numbers they recorded in the plenary. They work out as many different addition and subtraction calculations as possible using the five numbers, mentally with/without jottings and make a note of the methods used. **By the end of the lesson the children should be able to:** • **Add and subtract any pair of two-digit numbers mentally using an efficient strategy;** • **Explain methods used.** (Refer to supplement of examples, section 6, pages 44, 46.)

Planning sheet	Day Three	Unit 2 *Addition and subtraction 1*		Term: *Summer*	Year Group: *4*

Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**	**Teaching Activities/Focus Questions**
| Subtract any pair of two-digit numbers.<br><br>Explain methods. | • Write on the board: 86.<br><br>**Q** What is 86 − 9?<br><br>Agree it is 77.<br><br>• Record 86 − 9 = 77. Ask quick fire questions involving 86 − 39, 86 − 59, etc. varying the 10s digit as shown.<br><br>**Q** What facts are we using?<br><br>Establish that knowing 86 − 9 = 77 helps with the calculations.<br><br>• Repeat with other starting numbers, e.g. 71 and a single-digit subtraction such as: 71 − 6, building on the answer to answer quick fire questions, 71 − 36, etc.<br><br>• Write on the board: 95 − 47.<br><br>**Q** How does the work we have been doing help us with this calculation?<br><br>Agree that we can use 95 − 7 = 88, and 88 − 40 to get the answer 48. | Understand the principles of the associative law as it applies to addition.<br><br>Develop written methods for column addition of two three-digit numbers.<br><br><br><br><br><br><br><br><br><br><br><br><br><br>VOCABULARY<br>digit<br>align | • Discuss the homework. Ask the children to choose any three of the numbers from their homework and to work out a simple way to add them together. Take feedback after a reasonable time and ask volunteers to explain how they found their answer. Record the calculation on the board and, if appropriate, ask whether anyone can see an easier way to find the total. Discuss suggestions and illustrate any that are particularly interesting or useful.<br><br>• Write on the board: 37 + 25 + 12.<br><br>**Q** What is the easiest way to add these numbers together?<br><br>Take suggestions and draw out that the order of the addition is unimportant, i.e. that (37 + 25) + 12 = 37 + (25 + 12); that doing 25 + 12 first leaves double 37 to be calculated, which they should be able to do mentally.<br><br>• Write on the board: 367 + 586.<br><br>**Q** Why are these numbers more difficult to add together mentally?<br><br>Agree that the calculation is difficult to remember without jottings. Ask the children to use a written method to find the total. Take feedback and discuss methods used.<br><br>• Focus on the use of column addition and demonstrate the process, starting from the units as shown below. Emphasise the importance of aligning the numbers correctly in the columns.<br><br>```
   367
+  586
    13      (6 + 7)
   140      (80 + 60)
   800    (500 + 300)
   953
```<br><br>**Q** Would it make any difference to the answer if we had added the 100s first?<br><br>Establish that the order of the addition is unimportant, as when totalling three numbers.<br><br>• Work through an addition adding the 100s first to confirm this.<br><br>• Ask the children to prompt the method. Repeat using both methods.<br><br>• Ask the children to calculate 648 + 276. With the class, work through the calculation on the board, clarifying any misconceptions that are evident.<br><br>• Set the children a range of addition calculations to do, mixing two-digit additions and three-digit additions. Ask the children to decide whether they do them mentally, with jottings or as a column addition. | • Discuss answers and the methods the children used.<br><br>**Q** Which did you do mentally?<br><br>Establish for which questions the children needed to use a column addition. Work through some of them with the class; emphasise the need to align digits and to record accurately.<br><br>• Write on the board: 401 + 362.<br><br>**Q** Can we do this mentally?<br><br>Agree that the answer is 763 and this does not require a column method. Write on the board: 389 + 478.<br><br>**Q** Can we do this mentally?<br><br>Agree that this is better done by a column method to keep track of the stages. Work through this with the children.<br><br>Remind the children that they should not turn to a column method whenever they see a three-digit addition, but should look carefully at the numbers involved.<br><br>**By the end of the lesson the children should be able to:**<br><br>• **Understand that addition can be done in any order;**<br>• **Add two three-digit numbers using a written column method where appropriate.**<br>(Refer to supplement of examples, section 6, page 48.) |

Planning sheet	Day Four	Unit 2 *Addition and subtraction 1*		Term: *Summer*	Year Group: *4*

Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**	**Teaching Activities/Focus Questions**
Add/subtract 10, 100, 1000 to/from any two- or three-digit number.	• Roll three large dice to generate a three-digit number. The children add 10 and write their answer on whiteboards. Discuss what happens to the digits. Repeat generating other two- and three-digit numbers; extend to adding 100 and a 1000 to the number. • Write 500 on the board. We can only add or subtract 100 and 10. I want to get 890. Q How can we add/subtract to 500 to get 890? Collect answers and compare numbers of calculations involved. Record shortest calculation on the board: 500 + 100 + 100 + 100 + 100 – 10. Repeat with other numbers, including adding 1000.	Refine written methods for column addition by 'carrying' below the line.	• Remind the children of the addition method used in the previous lesson, and tell them that we are going to make it even more efficient. Display the enlarged Resource sheet 2.2. Choose two three-digit numbers on the sheet (not ones that the children could easily add mentally). • Work through yesterday's method, then link to the method with 'carrying', explaining each stage, e.g. $\begin{array}{r} 617 \\ + 275 \\ \hline 12 \end{array}$ $\begin{array}{r} 617 \\ + 275 \\ \hline 2 \\ 1 \end{array}$ then $\begin{array}{r} 617 \\ + 275 \\ \hline 12 \\ 80 \end{array}$ $\begin{array}{r} 617 \\ + 275 \\ \hline 92 \\ 1 \end{array}$ then $\begin{array}{r} 617 \\ + 275 \\ \hline 12 \\ 80 \\ 800 \\ \hline 892 \end{array}$ $\begin{array}{r} 617 \\ + 275 \\ \hline 892 \\ 1 \end{array}$ • Choose two more numbers from the number board, and carry out addition with the children helping. • Ask the children to work in pairs on given examples. Check answer, and correct any errors. • Ask the children to choose pairs of numbers from the board for which they need to use this column method. Remind them to check whether they can carry out the additions in their heads.	• Ask the children to explain how they added pairs of numbers from the board and work through some examples. • Write on the board: $\begin{array}{r} 345 \\ + 468 \\ \hline 1011 \\ 33 \end{array}$ $\begin{array}{r} 345 \\ + 468 \\ \hline 7113 \\ 1 \end{array}$ Q Why are these answers incorrect? Get the children to identify how the errors were made. **By the end of the lesson the children should be able to:** • **Use and explain addition methods;** • **Use the carrying method for column addition of two three-digit numbers.** (Refer to supplement of examples, section 6, page 48.)
		VOCABULARY column carrying		
RESOURCES Large dice Whiteboards		RESOURCES Resource sheet 2.2 Number board		

Planning sheet	Day Five	Unit 2 *Addition and subtraction 1*	Term: *Summer*	Year Group: *4*

Oral and Mental

Objectives and Vocabulary	Teaching Activities
Read, write and order numbers up to 10 000.	• Write a four-digit number on the board and ask the children to read it aloud together. Repeat with five further four-digit numbers, including some that have the same 1000s and 100s digits, and some with at least one zero placeholder.

Q Which is the largest number?

Q Which is the smallest?

Q How did you decide?

Establish that the 1000s digit is considered first, then the 100s where the 1000s are the same, and so on.

• Ask the children to order the numbers, smallest first. Take answers from individuals and record the order on the board.

• Write another set of six four-digit numbers on the board. Ask the children to read each one aloud together. Ask them to work in pairs to order the numbers, starting with the largest. Take feedback and record the order on the board.

Repeat.

VOCABULARY
thousands
hundreds
tens
units

Main Teaching

Objectives and Vocabulary	Teaching Activities
Develop and refine written methods for column addition of more than two whole numbers less than 1000.	• Write on the board: 643, 78, 67.

Q How do you think we should add these numbers together?

Discuss suggestions, try some out and focus on (or suggest) writing the numbers in columns and using the carrying method. Demonstrate on the board, emphasising the importance of aligning the digits in the correct columns, including the 'carried' digits.

• Provide two or three examples for pairs of children to set out and total, e.g. 73, 562, 34, 458, 26, 164, 83, 177, 8, 46. Ask the children to prompt as you set out the calculation and find the total. Clarify any misconceptions the children may have.

• Give out Activity sheet 2.1. Explain that it shows the scores achieved by six teams in a three-round quiz. The children should work out the total score for each team and record it in the end column. They can use the space on the sheet for written calculations.

VOCABULARY
digit
place value
align
column

RESOURCES
Activity sheet 2.1

Plenary

Teaching Activities/Focus Questions

• Collect answers and agree the total for each team. Correct any errors.

Q Which additions did you do using a column method?

Q Was it possible to work any out mentally?

• Remind the children of the work covered during the week on strategies for mental addition and subtraction and using carrying when adding numbers in columns. Write a set of addition calculations on the board covering the range of methods and strategies developed in the unit.

Q Which of these can you work out in your heads?

For each suggestion establish the strategies the children would use.

By the end of the lesson the children should be able to:

• **Use a written column method for adding more than two numbers when the numbers are difficult to add mentally.**

(Refer to supplement of examples, section 6, page 48.)

List B

61p

9p

41p

69p

28p

49p

78p

37p

51p

19p

31p

List A

86p

£2.50

98p

84p

95p

87p

£2.75

80p

£3.62

£1.43

716	617	113	438
283	456	275	312
517	338	844	629
394	127	245	146

Unit 2 Year 4 (Summer Term)

Activity sheet 2.1

Team	Round 1	Round 2	Round 3	Total
Blue	136	84	12	
Green	148	98	6	
Red	86	127	18	
Yellow	137	148	15	
White	101	79	16	
Gold	127	99	13	

Work out the total for each team.
Set out written calculations in the space below.