Unit 2
Addition and subtraction

Year 4
Spring term

Five daily lessons

National
Numeracy *Strategy*

Unit Objectives
Year 4

• Understand the principles (not the names) of the commutative and associative laws as they apply or not to addition and subtraction.	Pages 34, 36
• Partition into tens and units, adding the tens first.	Page 40
• Add three or four small numbers, finding pairs that total 10, or 9 or 11.	Page 42
• Add three two-digit multiples of 10, such as 40 + 70 + 50.	Page 42
• 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

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 2.1a
- Resource sheet 2.1b
- Resource sheet 2.2
- Activity sheet 2.1
- Activity sheet 2.2
- OHT 2.1
- Whiteboards
- Dice – (9, 9, 19, 19, 29, 29)
- 100 square

Link Objectives

Year 3

- **Know by heart all addition and subtraction facts for each number to 20.**
- 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 knowledge that addition can be done in any order to do mental calculations more efficiently.
- Partition into tens and units then recombine.
- Add three or four small numbers by putting the largest number first and/or by adding pairs totalling 9, 10 or 11.
- **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 patterns of similar calculations.

Year 5

- Develop further the relationship between addition and subtraction.
- Partition into H, T, and U, adding the most significant digits first.
- Add several numbers (e.g. four or five single digits, or multiples of 10 such as 40 + 50 + 80).
- Add or subtract the nearest multiple of 10 or 100, then adjust.

(Key objectives in bold)

department for
education and skills

NNS Unit Plans

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

Oral and Mental

Objectives and Vocabulary	Teaching Activities
Derive doubles of multiples of 10 to 500.	• Children to use whiteboards to show their answers to doubling questions. **Q** What is double 3? What is double 30? Continue with other pairs e.g. 8, 80; 6, 60 • Repeat asking children to find doubles of hundreds e.g. 300, 100, 200, 400. Record doubles for reference. **Double** 5 — 10 50 — 100 500 — 1000 etc. — etc. **Q** How can we use these facts to double numbers like 320? Work through double 300 and double 20 $600 + 40 = 640$ • Repeat asking children to double other three-digit numbers up to 500. Record for reference. **Double** 120 — 240 230 — 460 180 — 360 90 — 180

VOCABULARY
double

RESOURCES
Whiteboards

Main Teaching

Objectives and Vocabulary	Teaching Activities
Understand the principles (not the names) of the commutative and associative laws as they apply or not to addition and subtraction. Add three or four small numbers finding pairs that total 10. Add three two-digit multiples of 10, such as 40 + 70 + 50.	• Write on the board: $1 + 2 + 3 + 4 + 5 + 5 + 6 + 7 + 8 + 9$ Ask children to add these up. **Q** Did anyone spot a quick way to do this? • Agree on finding pairs which sum to 10 and count up in 10s to get the answer. • Write on board $3 + 4 + 7$. Remind children of the method of finding pairs that sum to 10. **Q** What is $30 + 40 + 70$? Discuss responses and highlight the pair that sums to 100. • Give children similar lists of three multiples of 10 to add. Discuss responses. • Organise children into groups of 3 or 4 and give each group the cards from Resource sheets 2.1a and 2.1b. The groups play a matching pairs activity. They place the cards face down. In turn they turn two cards over and keep them if they are equal e.g. [$3 + 2 + 7$] [12] When all pairs have been claimed children ask each other for pairs which will complete their family. e.g. If a child has [$3 + 2 + 7$] and [12] he/she could ask another player **Q** (Name), have you got $30 + 20 + 70$ and 120? If the player has the cards, he/she must surrender them. At the end of game the winner is the child who has collected most 'families'.

VOCABULARY
total
strategy

RESOURCES
Resource sheet 2.1a
Resource sheet 2.1b
Activity sheet 2.1

Plenary

Teaching Activities / Focus Questions

• Draw on the board the first empty-box statement of a spider diagram.

$140 + \square + \square$ —— (230)

Q What pairs of numbers could complete this number sentence?

Take suggestions and note them on the board.

Q Which pair was the easiest to find? Why?

• Draw out how the earlier activities have helped.

• Extend the spider diagram by adding more empty-box statements:

Discuss efficient methods for completing the diagram

• Introduce homework activity.

HOMEWORK – Activity sheet 2.1.

90	30	70	40	50	80	10
40	40	60	70	40	20	90
30	80	20	50	40	10	80
90	0	70	60	50	30	80
70	40	50	20	30	90	0
60	30	10	80	70	10	90

Find sets of four squares that add to a total of 200 e.g.

30	70
40	60

= 200

How many can you find?

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

• **Add three or four small numbers, finding pairs that total 10, or 9 or 11;**
• **Add three two-digit multiples of 10.**

(Refer to supplement of examples, section 6, page 42.)

Planning sheet	Day Two	Unit 2 *Addition and subtraction*	Term: *Spring*	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 and Vocabulary	Oral and Mental – Teaching Activities	Main Teaching – Objectives and Vocabulary	Main Teaching – Teaching Activities	Plenary
Derive halves of multiples of 10 to 500.	● Display Resource sheet 2.2. Point to a number and ask children to halve the number. Discuss the methods the children use. Repeat. 	60	190	490	180	240
460	230	90	300	470
120	70	480	30	360
380	250	500	270	150 | **Q** What happens when we halve an odd multiple of ten? What is the inverse operation to halving?	Add or subtract the nearest multiple of 10, then adjust.	● Collect children's responses to homework by asking for six different ways to make 200. ● Introduce quickfire questions involving multiples of 10 e.g. 80 − 30, 20 + 40, 50 − 30. Extend to adding three multiples of 10 e.g. 20 + 50 + 10 = or: 40 + 30 − 20 = Now consider 60 + 20. Identify answer. **Q** What if the calculation were 60 + 19? Discuss. Repeat interactively with a series of examples adding 9, 19, 29, 39 etc. Refine explanations by modelling on a number line e.g. 60 + 19 = $+20$ -1 60 79 80 Now consider 57 + 20. Identify answer. **Q** What if the calculation were 57 + 19? Discuss. Repeat interactively with a series of examples starting with any two-digit number, adding 9, 19, 29, 39 etc. Refine explanations by modelling on a number line. e.g. 47 + 39 $+40$ -1 47 86 87 Provide children with a set of calculations to complete. There is potential in the lesson to explore adding 9,19 etc. using a 100 square and showing Flash animation of number grid to demo/illustrate.	● Write: 24 + 9 = ☐; 86 + 9 = ☐; 24 + 19 = ☐; 86 + 19 = ☐; 24 + 29 = ☐; 86 + 29 = ☐; Ask children for the answers and discuss their methods and the pattern. Ask them to extend the pattern. Discuss crossing the 100 boundary. Repeat for subtraction. Write: 34 − 9 = ☐; 86 − 9 = ☐; 34 − 19 = ☐; 86 − 19 = ☐; 34 − 29 = ☐; 86 − 29 = ☐; **By the end of the lesson the children should be able to:** ● **Work out mentally that 63 + 29 = 92** **78 − 64 = 14** **57 − 29 = 28** (Refer to supplement of examples, section 6, page 40.)
VOCABULARY inverse RESOURCES Resource sheet 2.2				

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

Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**	**Teaching Activities / Focus Questions**
Derive multiplication facts in 8 times table and begin to recall them.	• Quickly get the children to count forwards and backwards in 2s and 4s. Write grid on the board: 		0	1	2	3	4	5	6	7	8	9	10
double											
double											
double											| • Ask the children to help you fill in the answers. **Q** What times table is represented by the numbers in the first row? Replace 'double' by writing ×2. Repeat the question to replace the 'doubles' with ×4 and ×8. • Draw on the table and ask quick fire questions: – 5 × 8 = ? – What are eight eights? – 9 multiplied by 8 is? – 3 times 8 = ? . . . • Remove the table and ask further questions, include 2 and 4 times tables. Children show answers on whiteboards. Alternative starter might be to return to Flash animation of number grid from previous lesson and re-inforce/extend to adding on 19, 29, 39 etc. subtracting 19, 29 etc.	Add or subtract the nearest multiple of 10, then adjust.	• Write on the board 56 – 30; ask children for the answer. Repeat for 56 – 29. Refer to previous lesson. Give children further examples to complete e.g. 63 – 19, 78 – 39 etc. Invite children to explain their strategies. Refine explanations by modelling on an empty number line. **Q** What is 56 – 28? Collect responses. • Draw on the board: —————————————|—— 56 • Invite a child to model on a number line e.g. –10 –10 –10 +2 26 36 46 56 Establish the answer will be 28. Refine model to show the tens jumps can be replaced by one jump to the nearest 10, and then adjust with an addition. Play 'race to zero' in pairs. Each child starts by writing 250. Take it in turns to roll the 9, 9, 19, 19, 29, 29 dice. Subtract the dice roll from their own number each time. First to get down to a units number is the winner.	• On the board write: Jennie has 57p and spends 29p. How much money has she left? • Discuss how the children will solve this. • Present another question involving addition. Discuss their methods and solutions. • Present a question involving subtraction. Discuss methods and solutions. **By the end of the lesson the children should be able to:** • **Add or subtract numbers less than 100 by rounding to the nearest multiple of 10, then adjusting.** (Refer to supplement of examples, section 6, page 40.)
RESOURCES Whiteboards		**RESOURCES** Dice (9, 9, 19, 19, 29, 29)		

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

Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**	**Teaching Activities / Focus Questions**
Recognise odd and even numbers and some of their properties.	• Play 'Number Collector' in this way: Teacher decides on a criterion e.g. 'multiple of 10' but does not communicate it to the children. Children write a number within the range 0-40 on their whiteboards. They show the teacher, who then decides whether or not they can belong to the collection based on the criterion. The collection display their numbers to the rest of the class who then try to change their numbers until they belong to the collection. Repeat with different criteria. e.g. Even number greater than ... Odd number less than ...	Add or subtract the nearest multiple of 10, then adjust.	• Recap the strategies used over the past two days. Q What is the most efficient way of adding 19 to a number? Discuss and establish adding 20 and adjusting. Q What is the most efficient way of subtracting 59 from a number? Discuss and establish subtracting 60 and adjusting. Play 'Gridlock' - Activity sheet 2.2. The aim of the game is for each player to fill their grid and the winner is the first person to then cross out all of their numbers. Each player fills a square by looking at the base grid e.g. $\boxed{28}$ They each throw the dice and write in their own square the sum of the dice roll and the base grid. Once the squares are filled players now try to cross off numbers. If a player rolls a 9 they can cross off any one number they have made by adding 9. The first player to cross off all of their numbers is the winner.	Q How would you explain to someone how to add/ subtract 19, 29? Collect responses and summarise as a display for the classroom. Explore strategies using empty number line, 100 square. **By the end of the lesson the children should be able to:** • **Add or subtract numbers less than 100 by rounding to the nearest multiple of 10 and adjusting.** (Refer to supplement of examples, section 6, page 40.)
RESOURCES Whiteboards		RESOURCES Activity sheet 2.2 Dice (9, 9, 19, 19, 29, 29)		

NNS Unit Plans

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

Oral and Mental

Objectives and Vocabulary	Teaching Activities
Recall multiplication facts in 2, 3, 4, 5, 10 times tables and derive division facts.	• Children recite the 2, 3, 4, 5, 10 times tables. • Display OHT 2.1, multiplication grid. Point to an empty box and get children to identify and complete the associated multiplication fact and derive the division facts.

Multiplication grid:

	1	2	3	4	5	6	7	8	9	10
×2										
×3										
×4										
×5										
×10										

VOCABULARY
divided by

RESOURCES
OHT 2.1

Main Teaching

Objectives and Vocabulary

Understand the principles (not the names) of the commutative and associative laws as they apply or not to addition and subtraction.

Partition into tens and units, adding tens first.

Teaching Activities

• Write on the board $50 + 30$
  Ask for the answer.

• Now write $54 + 38$ and ask how this could be solved.

• Demonstrate on the board how partitioning helps:
  $54 = 50 + 4$, $38 = 30 + 8$

$$\begin{array}{r} 50 + 4 \\ 30 + 8 \ + \\ \hline 80 + 12 \end{array}$$

Establish that $80 + 12 = 92$

• Ask children to work in pairs, to choose a number each from the hundred square and add them together, recording as appropriate. Discuss the calculations and methods of recording.

• Let children continue to work together choosing as many pairs of numbers as they can from the hundred square and finding the total.

> **Q** Need to explore subtraction – do laws apply or not? (Last lesson in unit.)

> **Q** Can you use the same strategy to subtract one number from the other?

Demonstrate on the board how partitioning helps.
$87 = 80 + 7$, $64 = 60 + 4$

$$\begin{array}{r} 80 + 7 \\ 60 + 4 \ - \\ \hline 20 + 3 \end{array}$$

• Establish that $87 - 64 = 23$

• Demonstrate what to do when the number you are subtracting is larger than the number you are subtracting from i.e. when subtracting 37 from 64.

• Demonstrate on the board how partitioning helps
  $64 = 60 + 4$, $37 = 30 + 7$

$$\begin{array}{r} \cancel{60} + \cancel{4} \\ 30 + 7 \ - \end{array} \quad \longrightarrow \quad \text{Becomes} \quad \begin{array}{r} 50 + 14 \\ 30 + 7 \ - \\ \hline 20 + 7 \end{array}$$

• Explain how the 10 has been taken from the 60 to make 14.

• Establish that $64 - 37 = 27$

VOCABULARY
multiple
partition

RESOURCES
Hundred square

Plenary

Teaching Activities / Focus Questions

• Remind children of the original example $54 + 38 = 92$.
  Write up the following $38 + 54$

> **Q** Is this going to have the same answer? How do you know?

Write on the board $34 + 58$.

> **Q** What will the answer be to this? How do you know?

• With the children calculate $47 + 56$ using partitioning.

> **Q** What other additions do we know that have the same answer?

Collect responses and discuss.

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

• **Work out mentally that**
  $38 + 36 = 74$
  $89 - 27 = 62$
  $74 - 36 = 28$

(Refer to supplement of examples, section 6, page 40.)

Homework

90	30	70	40	50	80	10
40	40	60	70	40	20	90
30	80	20	50	40	10	80
90	0	70	60	50	30	80
70	40	50	20	30	90	0
60	30	10	80	70	10	90

Find sets of four squares that add to a total of 200,

i.e.

30	70
40	60

= 200.

How many can you find?

GRIDLOCK – A Game for 2 Players

Base Grid

1	2	3
28	56	72
4	5	6
39	47	65
7	8	9
19	83	41

Player 1

1	2	3
4	5	6
7	8	9

Player 2

1	2	3
4	5	6
7	8	9

You need a
9, 9, 19, 19, 29, 29 dice.

Game 1 – Add
Game 2 – Subtract
Game 3 – Both

$9 + 6 + 1$	16	$90 + 60 + 10$	160	$9 + 8 + 4$
$6 + 5 + 4$	15	$60 + 50 + 40$	150	21
$7 + 9 + 3$	19	$70 + 90 + 30$	190	$90 + 80 + 40$
$4 + 5 + 3$	12	$40 + 50 + 30$	120	210

Resource sheet 2.1b

$9 + 8 + 2$	200	$40 + 90 + 70$	20
19	190	$50 + 80 + 60$	19
$90 + 80 + 20$	170	$30 + 60 + 80$	17
190	170	$50 + 80 + 40$	17

$4 + 9 + 7$
$5 + 8 + 6$
$3 + 6 + 8$
$5 + 8 + 4$

240	180	490	190
470	300	90	230
360	30	480	70
150	270	500	250
			60
			460
			120
			380

Multiplication grid

	1	2	3	4	5	6	7	8	9	10
×2										
×3										
×4										
×5										
×10										