Unit 12
Addition and subtraction

Five daily lessons

National
Numeracy *Strategy*

Year 4
Summer term

Unit Objectives

Year 4

• Consolidate understanding of relationship between + and –	Pages 34, 36
• **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 fine written methods for column addition and subtraction of two whole numbers less than 1000.**	**Pages 48, 50**

Link Objectives

Year 3

- 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 known number facts and place value to add/subtract mentally.
- Use informal pencil and paper methods to support, record or explain HTU ± TU, HTU ± HTU.
- Begin to use column addition and subtraction for HTU ± TU where the calculation cannot easily be done mentally.

Year 5

- **Extend written methods to column addition/subtraction of two integers less than 10 000.**
- Use known number facts and place value for mental addition and subtraction.

(Key objectives in bold)

This Unit Plan is designed to guide your teaching.

You will need to adapt it to meet the needs of your class.

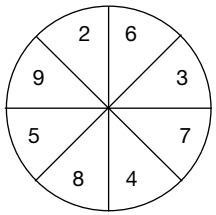
Resources needed to teach this unit:

- Resource sheet 12.1
- Activity sheet 12.1
- Activity sheet 12.2
- Activity sheet 12.3
- OHT 12.1
- Self-assessment sheet 12.1
- Half-full jar containing approx 120 sweets or small objects; another containing 100.
- Demonstration set of place value cards
- Place value cards (class set)
- Digit cards
- Three large dice
- Whiteboards
- Counters

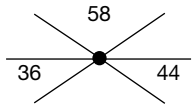
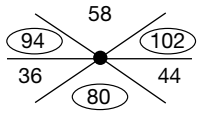
department for
education and skills

Planning sheet	Day One	Unit 12 *Addition and subtraction*	Term: *Summer*	Year Group: *4*

Oral and Mental

Objectives and Vocabulary	Teaching Activities
Consolidate by knowing by heart addition and subtraction facts for all numbers to 20.	• Draw a dartboard:  Challenge the children to find a way of making 15 with three dart throws. **Q** How many alternative ways can you find? • Change the target number to 17. **Q** How many ways can you find for this total? Repeat with different target numbers.

Main Teaching

Objectives and Vocabulary	Teaching Activities
To use known number facts and place value to add or subtract mentally, including any pair of two-digit whole numbers. RESOURCES Activity sheet 12.1	• Write up on the board a range of additional calculations: 36 + 37 48 + 64 83 + 39 58 + 64 65 + 18 Ask questions such as: **Q** What strategies would you use to work out these calculations? **Q** Did you make any jottings? **Q** Could you have used a different method? **Q** How could you check that your answer is correct? • Draw a star grid on the board and write numbers in alternate segments:  Ask the children to discuss in pairs how to add pairs of numbers and write answers in between. **Q** Can you explain the strategy that you used to add each pair of numbers? **Q** Did you use the same strategy for each calculation? Take feedback.  Ask the children to add opposite pairs of numbers together: 94 + 44 36 + 102 58 + 80 **Q** Did you use the same method for each calculation? **Q** What do you notice about the totals? • Give the children star grids Activity sheet 12.1 on which they write three two-digit numbers. • Write the following numbers on the board for the children to choose from: 75, 19, 38, 27, 62, 44. Remind the children that they might use alternative strategies for different numbers.

Plenary

Teaching Activities/Focus Questions
• Discuss the previous activity. **Q** What strategies did you use? Make sure partitioning and adding the nearest multiple of 10 are covered. • Put 58 + □ = 100 on the board. Discuss possible strategies and record the various methods as number sentences, number lines, etc. • Try 486 + □ = 500. Would you use the same method? **Q** Has everyone used the same method for the calculation? **Q** Which method is used most often? **Q** Which method do you think is most efficient? **By the end of the lesson the children should be able to:** • **Choose the appropriate/efficient mental strategy to add or subtract a pair of two-digit whole numbers.** (Refer to supplement of examples, section 6, pages 44 and 46.)

Planning sheet	Day Two	Unit 12 *Addition and subtraction*	Term: *Summer*	Year Group: *4*

Oral and Mental

Objectives and Vocabulary

To make and justify estimates to about 250.

Teaching Activities

- Show the children a jar half full containing approximately 120 sweets or small objects.

  Ask the children to estimate the number of objects in the jar.

  Draw a number line on the board and write 0 at one end and 300 at the other. Choose volunteers to mark their estimates on the line.

  Now show the children a container holding 100 similar items, and tell them the quantity.

  Q Does anyone want to revise their estimate?

  Point out how estimation is much easier when there is something to compare with. Tell the children the accurate number.

  Q Whose estimate was closest?

  Look at the jar, which is about half full.

  Q Roughly how many sweets would be in a full jar?

Main Teaching

Objectives and Vocabulary

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

VOCABULARY
inverse

RESOURCES
Activity sheet 12.2
OHT 12.1
Counters (two colours per pair)
OHP counters

Teaching Activities

- Write on the board:
  50 – 30 = 70 – 44 = 92 – 89 = 84 – 19 = 98 – 43 =

  The children work in pairs to calculate and discuss their strategies.

  Q Did you use the same strategy for each calculation?

  Q Did you make any jottings?

  Take feedback and discuss the strategies used. Ensure these include counting on, partitioning, known facts and subtracting a multiple of 10 and adjusting.

  Q Could you have used a different method?

  Q How could you check your answer?

- Write on the board:

  84 – 19 = 65

  so 65 + ☐ = ☐

  Remind the children of the importance of inverse operations as a checking strategy.

  Explain that we are going to play a game to practise adding and subtracting.

  Display Activity sheet 12.2/OHT 12.1. Explain that the purpose of the game is to get four numbers in a row. Write on board: 23, 49, 51, 97, 40, 63, 82, 67, 13.

  Divide the class in half and play the game. Ask a child from team A to choose two numbers and add or find the difference between them to cover a number on the grid. Repeat for the other team. If you wish, continue until one team has four numbers in a row.

  In pairs the children play the game.

Plenary

Teaching Activities/Focus Questions

- Write up these two grids on the board:

  Grid A

625	2393	354
5956	1337	902

  Grid B

9	4	7
5	6	8

  Choose one number from each grid. Ask pairs of pupils to find the total difference between them.

  Q Are these the same strategies you used with two-digit numbers?

  Q What strategies do you use when you have a one-digit number and a much larger number?

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

- **Choose and use an appropriate mental calculation strategy to add or subtract a pair of two-digit numbers;**
- **Use checking strategies in particular inverse operations.**

(Refer to supplement of examples, section 6, pages 44 and 46.)

Planning sheet	Day Three	Unit 12 *Addition and subtraction*	Term: *Summer*	Year Group: *4*

Oral and Mental

Objectives and Vocabulary

Know and use the relationships between familiar units of mass.

Begin to know multiplication facts, and derive quickly division facts for the 6 times table.

VOCABULARY
round to the nearest 10/100
four-digit number

Teaching Activities

- Write on the board:

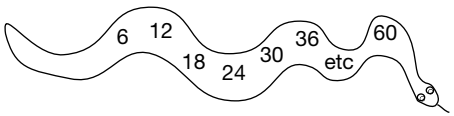
Too Heavy	Too Light

Explain that you are writing a weight (such as 2 kg 700 g) on a piece of paper. Write it so that the children can't see it, and fold it up. They have to make guesses which you record in the appropriate column of the grid. Ask occasionally for other ways to write it, e.g. 1½ kg, 1 k 500 g, 1.5 kg, 1500 g.

Q What must it be heavier/lighter than?

Q What must my amount be between?

Draw the following on the board:



Count backwards and forwards in sixes.

Q What are four 6s? How does the snake picture help you to work it out? How many 6s are there in 48?

Ask the children to choose two or three multiples of 6 to rub out or cover over.

Ask more multiplication and division questions – reinforcing how to work them out.

Main Teaching

Objectives and Vocabulary

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

Refine column addition and subtraction of two whole numbers less than 100.

VOCABULARY
inverse

RESOURCES
Demonstration place value cards
Class set place value cards
Self-assessment sheet 12.1

Teaching Activities

- Demonstrate the activity by using a demonstration set of place value cards. Invite a volunteer to select (unseen) one 100s card, two 10s cards and two unit cards and arrange them to make a three-digit and a two-digit number. A second volunteer explains how to add the numbers mentally. Ask questions such as:

Q What did you start with and why?

Q Is there another way?

Q Is it quicker?

Show how to check the calculation by subtracting the two-digit number from the total and explaining your method.

- Give the children an opportunity to repeat the activity (using place value cards) with a partner, adding and checking by subtracting mentally (some children may need to use jottings).
- Bring the class back together and repeat the activity using two three-digit numbers asking volunteers to demonstrate and explain a written method – informal or formal. Ask questions such as:

Q Is there another way?

Q Could you do it mentally?

Discuss briefly reasons for working mentally/choosing a written method.

- Give the children an opportunity to repeat the activity with a partner adding/subtracting two three-digit numbers, using a mental or written method as appropriate.

Plenary

Teaching Activities/Focus Questions

ASSESSMENT – Give out Self-assessment sheet 12.1. Allow time for children to read and complete the first problem on the sheet and describe their strategies to a partner.

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

- **Decide and use an appropriate strategy for addition/subtraction of any two whole numbers less than 1000.**

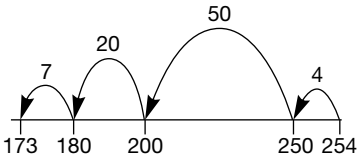
(Refer to supplement of examples, section 6, pages 44 and 46.)

Planning sheet	Day Four	Unit 12 *Addition and subtraction*	Term: *Summer*	Year Group: *4*

Oral and Mental

Objectives and Vocabulary	Teaching Activities
Use symbols correctly, including: <, > and =. Recognise and extend number sequences. RESOURCES Whiteboards	• Write on the board: 1370 640. Ask the pupils to draw on their whiteboards the sign to put between (>). Remind them that the biggest gap is next to the biggest number. Try other pairs of numbers to use <, > and =. • Repeat with simple calculations, e.g. 8 + 4 9 + 1 Count in steps of 25, forward and back, from 0, 100, etc. including counting back from 100 to –100.

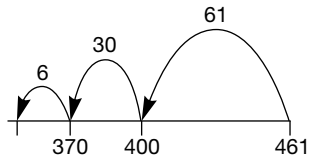
Main Teaching

Objectives and Vocabulary	Teaching Activities
Develop and refine written methods for column addition and subtraction of two whole numbers less than 1000. VOCABULARY inverse RESOURCES Activity sheet 12.3 Digit cards	• Write the calculation 254 – 173 on the board. • Demonstrate the calculation using the empty number line:  4 + 50 + 20 + 7 = 81 254 – 173 = 81 **Q** Can anyone demonstrate using the number line more efficiently? • Encourage the children to use fewer steps. **Q** Can anyone demonstrate the question using a written method? • Write the calculation 347 – 168 on the board. • Demonstrate a written method such as: 347 – 168 2 (170) 30 (200) 100 (300) 40 (340) 7 (347) 179 **Q** Can anyone use this written method more efficiently? **Q** Can anyone demonstrate this question efficiently using an empty number line? • Take six digit cards and rearrange into a three-digit subtract three-digit calculation. • Ask pairs of pupils to calculate the question using an appropriate efficient method. **Q** What tips could we give someone to calculate this question? **Q** How could we check the answer?

Plenary

Teaching Activities/Focus Questions

• Put a number line calculation on the board, e.g.



What was the calculation?

Q What is the same and what is different about the subtraction on the number line and as the written method?

HOMEWORK – Explain Activity sheet 12.3.

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

- **Refine a calculation method to its most efficient form;**
- **Use the inverse to check calculations.**

(Refer to supplement of examples, section 6, pages 48, 50.)

Planning sheet	Day Five	Unit 12 *Addition and subtraction*	Term: *Summer*	Year Group: *4*

Oral and Mental

Objectives and Vocabulary	Teaching Activities
Round any three-digit number to the nearest 10 or 100. Derive quickly all number pairs that total 100. VOCABULARY total number pair RESOURCES Three large dice Resource sheet 12.1	• Roll three large dice and write the three-digit number generated on the board. • Ask questions such as: **Q** Add/subtract 10, 100, 1000 and multiples of 10, 100, 1000. **Q** Round to nearest 10, 100, 1000. • Use Resource sheet 12.1 Flip-flop activity: establish that the flip-flop sheet displays 100 digits, ten to each box. Fold the flip-flop so that a point faces towards you, and the other points towards the children. **Q** How many can you see? **Q** How many can I see? e.g. 30, 70; 10, 90 Imagine that every time, one finger from my side has moved to your side. Now how many have you got? How many have I got? (31, 69; 11, 89). What if two fingers move to your side?

Main Teaching

Objectives and Vocabulary	Teaching Activities
Consolidate understanding of relationship between addition and subtraction. VOCABULARY digit units digit 10s digit 100s digit RESOURCES Whiteboards Counters Self-assessment sheet 12.1	• Discuss outcomes from last night's homework activity. **Q** Did everyone get the same results? • Write the following calculations on the board: $\begin{array}{r} 418 \\ +\ 25\square \\ \hline 672 \end{array}$ Discuss ways of finding the missing digit (4). **Q** What clues were there? (e.g. 8 + 4 = 12; 54 + 18 = 72; 418 + 250 = 668) **Q** Which number facts did you use? Repeat for $\begin{array}{r} 253 \\ +\ 6\square 5 \\ \hline 918 \end{array}$ or 648 – □ □ 3 = 135 • If appropriate, provide further examples, discussing clues and ways of finding the answer each time. • The children work in pairs. They write two addition calculations (including answers), cover/hide one digit in each with counters and present to their partner who finds the hidden number. • Repeat with subtraction examples. • If appropriate children could cover two digits.

Plenary

Teaching Activities/Focus Questions

- Present the following as 'sliding box' problems. The children might use whiteboards to show their solutions.

  256 – □ = 200

  421 + □ = 622

  54 + □ = 70

  □ + 93 = 200

- Ask questions such as:

  Q How did you work it out?

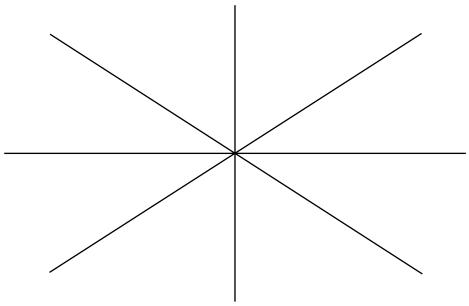
  Q Did anyone think about it in a different way?

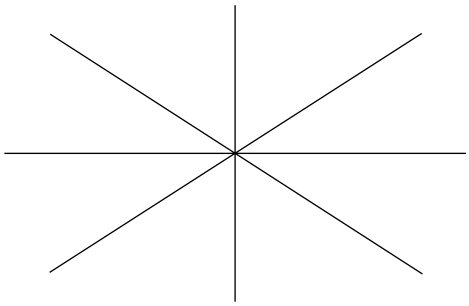
ASSESSMENT – Ask the children to get out Self-assessment sheet 12.1 and allow time for them to complete the second problem and describe their strategies to a partner. Then review and complete their target.

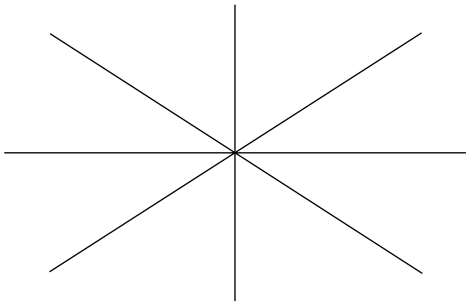
By the end of the lesson the children should be able to:

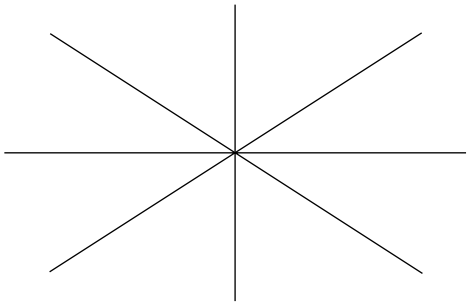
- **Use mental or written methods to find missing numbers;**
- **Understand the relationship between addition and subtraction.**

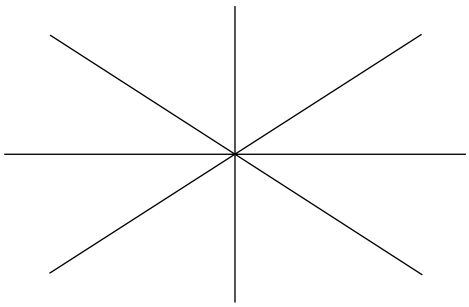
(Refer to supplement of examples, section 6, pages 34, 36.)

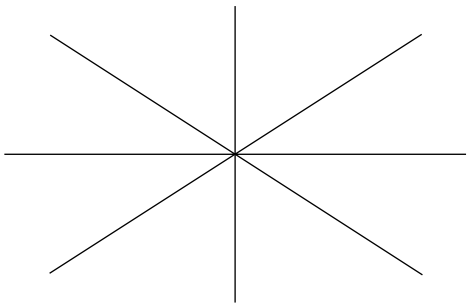












72	54	76	34
26	62	91	19
23	30	89	74
46	57	59	84

You are going to use these digits:

1, 2, 3, 4, 5, 6

- Arrange them any way you like to make an addition sum (HTU + HTU). What is the **total**?
- Rearrange them to make a subtraction (HTU – HTU). What is the **difference**?
- Try different arrangements (HTU + HTU). Which arrangement will make the **largest total**?
- Try different arrangements (HTU – HTU). Which arrangement will make the **smallest difference**?
- If you could use any six digits, which would you choose so as to make the biggest gap between the **largest total** and the **smallest difference**?

My Mathematics by .....

Calculate:

219 + 156 =

Do this in two different ways.

Tick the method you like best.

My calculation

I found
- one way ☐
- two ways ☐

My calculation

I did this calculation
- on my own ☐
- with others ☐

Calculate:

293 – 48 =

Do this in two different ways.

Tick the method you like best.

My calculation

I found
- one way ☐
- two ways ☐

My calculation

I did this calculation
- on my own ☐
- with others ☐

My next target:

I want to get better at _____

_____