National Numeracy Strategy

Unit 11
Addition and subtraction

Year 5
Summer term

This Unit Plan is designed to guide your teaching.
You will need to adapt it to meet the needs of your class.

Unit Objectives

Year 5

• Use known number facts and place value for mental addition and subtraction (e.g. 470 + 380, 810 – 380, 7.4 + 9.8, 9.2 – 8.6).	Pages 45, 47
• Use informal pencil and paper methods to support, record or explain additions and subtractions. **Extend written methods to: column addition/ subtraction of two integers less than 10 000;** addition of more than two integers less than 10 000; addition or subtraction of a pair of decimal fractions, both with one or both with two decimal places. (e.g. £29.78 + £53.34).	Pages 49, 51
• Choose and use appropriate number operations to solve problems, and appropriate ways of calculating; mental, mental with jottings, written methods, calculator.	Page 75

Link Objectives

Year 4

- **Use known number facts and place value to add or subtract mentally, including any pair of two-digit whole numbers.**
- Use informal pencil and paper methods to support, record or explain additions and subtractions. **Develop and refine written methods for: column addition and subtraction of two integers less than 1000, and addition of more than two such integers;** money calculations (for example £7.85 ± £3.49).
- **Choose and use appropriate number operations and appropriate ways of calculating (mental, mental with jottings, pencil and paper) to solve problems.**

Year 6

- Use known facts and place value to consolidate mental addition and subtraction (e.g. 470 + 380, 810 – 380, 7.4 + 9.8, 9.2 – 8.6).
- Choose and use appropriate number operations to solve problems and appropriate ways of calculating (mental, mental with jottings, written methods and calculator).
- Use informal pencil and paper methods to support, record or explain additions and subtractions. **Extend written methods to column addition and subtraction of numbers involving decimals.**

(Key objectives in bold)

Resources needed to teach this unit:

- Activity sheet 11.1
- Resource sheet 11.1
- Resource sheet 11.2
- OHT 11.1
- OHT 11.2
- OHT 11.3
- OHT 11.4
- Self-assessment sheet 11.1
- Calculators
- Whiteboards
- Large ‘slidey box’

department for education and skills

Planning sheet	Day One	Unit 11 *Addition and subtraction*	Term: *Summer*	Year Group: *5*

Oral and Mental

Objectives and Vocabulary

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

Add/subtract any pair of two-digit numbers, including crossing 100.

Find pairs with a sum of 100.

VOCABULARY
sum
total
subtract
difference

RESOURCES
Whiteboards
OHT 11.1

Teaching Activities

- Give the class quick-fire mental addition and subtraction questions.

  Ensure that a variety of vocabulary is used, e.g.

  Q What is 54 add 37?
  What is the sum of 43 and 66?
  What is 76 subtract 34?
  What is the difference between 85 and 58?
  How much more is 97 than 45?
  What is the total of 67 and 82? etc.

- Show OHT 11.1.

  Q What pairs of numbers can you see with a total of 100?

  Ask the children to show their answers on their whiteboards.

- Discuss pairs of numbers chosen and strategies used.

Main Teaching

Objectives and Vocabulary

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

VOCABULARY
add
sum
total
most significant digit
least significant digit

RESOURCES
Calculators

Teaching Activities

- Write the following problem on the board:

  I have £7587 in my savings account. I get five numbers in the National Lotto game and win £5675. How much money do I have now?

  Q What calculation do we need to carry out in order to answer this question?

  Establish that this is addition.

  Q What will the answer be approximately? How can we work out the answer?

  Agree the answer is between £12 000 and £14 000.

  Discuss the children's methods and establish that because the calculation is difficult to do in our heads it would be more appropriate to use a written method.

  Remind the class of the column method used for addition and work through the calculation showing how to add the most significant digits first, e.g.

```
    7587
+   5675
   12000   (7000 + 5000)
    1100   ( 500 +  600)
     150   (  80 +   70)
      12   (   7 +    5)
   13262
```

- Now ask the class to work through a problem with you, e.g. £4764 + £3457, and to record the solution in their books, making sure they line up the digits carefully. At each stage ask:

  Q How many thousands will there be?

  Q How many hundreds will there be?

  Q How many tens will there be?

  Q How many units will there be?

- On the board write 12 four-digit numbers. Ask the children to work in pairs. Each child chooses a four-digit number. Independently they are then to add these numbers together using the column method, compare their answers and repeat the exercise.

- Now ask the children to work in pairs and choose four numbers. They then add the four numbers together. Repeat.

- Give out calculators and ask the children to swap exercise books and mark each other's work, checking the additions with the calculator.

Plenary

Teaching Activities/Focus Questions

- Work through the following addition on the board, adding the least significant digit first. Tell the class to watch and see if they can spot what you are doing differently from the method you used at the start of the lesson.

```
    8327
+   4196
      13
     110
     400
   12000
   12523
```

  Q How is this method different from the method I showed you at the start of the lesson?

- Establish that instead of adding the most significant digits first, you have added the least significant digits, the units.

- Emphasise that it does not matter which they add first as long as they align the units, tens, hundreds and thousands.

- Ask the class to work through the following addition, adding the least significant digit first.

  £4764 + £3457

- Collect answers and ask a child to demonstrate their solution on the board.

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

- **Use written column methods for the addition of two or more integers less than 10 000;**
- **Know that units should line up under units, and so on.**

(Refer to supplement of examples, section 6, page 49.)

Planning sheet	Day Two (page 1 of 2)	Unit 11 *Addition and subtraction*	Term: *Summer*	Year Group: *5*

Oral and Mental

Objectives and vocabulary	Teaching Activities
Order decimals with the same number of decimal places. VOCABULARY decimal fraction decimal point decimal place tenths ascending descending RESOURCES Whiteboards	• On the board write 5.3 and 5.13. **Q** Which is the larger/ smaller number? Agree 5.3 is the larger and explain why. Explain that you are going to put six decimal numbers, with one decimal place, on the board for the children to place in ascending order (smallest first). Say that they are to record these on their whiteboards. • Collect answers and discuss the methods the children used to compare the sizes of the numbers. • Repeat writing up a mix of numbers with one and two decimal places, this time to put in descending order. • Collect and discuss the children's answers.

Main Teaching

Objectives and vocabulary	Teaching Activities
Extend written methods of addition to decimals with up to two decimal places. VOCABULARY most significant least significant RESOURCES Self-assessment sheet 11.1	• Display the following problem: I spent £63.37 at the supermarket, £25.92 on petrol and £4.85 for a snack. **Q** How much did I spend altogether? Discuss responses and establish that the calculation is addition. **Q** What estimate could we make for the answer? Discuss responses and agree a class estimate. • Remind the class of the column methods used in the previous lesson. **Q** What is the most significant digit in this problem? Establish that the tens of pounds are the most significant digits. **Q** Which is the least significant digit in this problem? Establish that the pennies in the hundredths column are the least significant digits. • Work through the addition calculation starting with the most significant digit, e.g. 63.37 + 25.93 4.85 80.00 (60 + 20) 12.00 (3 + 5 + 4) 2.00 (.3 + .9 + .8) 0.15 (.07 + .03 + .05) 94.15 • At each stage ask: **Q** How many tens are there? **Q** How many units are there? **Q** How many tenths are there? **Q** How many hundredths are there? **Q** How much do we have altogether?

Plenary

Teaching Activities/Focus Questions

ASSESSMENT – Give out Self-assessment sheet 11.1.

Allow time for the children to read and complete the first cloud question on the sheet.

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

- **Use column addition methods for decimals with up to two decimal places.**

(Refer to supplement of examples, section 6, page 49.)

Planning sheet	Day Two (page 2 of 2)	Unit 11 *Addition and subtraction*	Term: *Summer*	Year Group: *5*
Oral and Mental		**Main Teaching**		**Plenary**
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**	**Teaching Activities/Focus Questions**
			• Ask the children to carry out the same addition in their books but this time adding the least significant digits first. Emphasise the importance of aligning digits underneath one another and that the decimal points should also line up underneath one another. • On the board write 12 numbers, each with up to two decimal places. Ask the children to work in pairs. Each child chooses a number and each child then sums the pair of numbers. The children in the pair then compare their answers and repeat the exercise. • Tell the children to work in fours and choose and sum four numbers. They compare their answers and repeat the exercise.	

Planning sheet	**Day Three**	**Unit 11** ***Addition and subtraction***	**Term:** ***Summer***	**Year Group:** ***5***

Oral and Mental

Objectives and Vocabulary	Teaching Activities
Use known number facts and place value for mental addition and subtraction. Find pairs of numbers with a sum of 1000 and pairs of decimals with a sum of 1 or 10. VOCABULARY sum total place value RESOURCES Whiteboards	• Show OHT 11.1. Remind the children that earlier they selected pairs of numbers that totalled 100. Show OHT 11.2. Say that this time they are to select pairs of numbers that total 1000 and record these on their whiteboards. Discuss solutions and establish how knowing pairs of numbers that total 100 helped to identify pairs that total 1000. • Show OHT 11.3. **Q** How can our knowledge of number pairs which add up to 100 help us to find pairs of decimals which total 10? Discuss responses and establish that knowing, for example, that 45 + 55 makes 100 helps us to work out that 4.5 and 5.5 total 10. Ask the class to write on their whiteboards pairs of decimal numbers taken from OHT 11.3 that total 10. • Show OHT 11.4. **Q** How can our knowledge of number pairs which add up to 100 help us to find pairs of decimals which total 1? Discuss responses and establish that once again knowledge that 45 + 55 makes 100 helps us to work out that 0.45 + 0.55 total 1. Ask the class to write on their whiteboards pairs of decimal numbers, taken from OHT 11.4 that total 1.

Main Teaching

Objectives and Vocabulary	Teaching Activities
Extend written methods to column subtraction of integers less than 10 000. VOCABULARY subtract take away minus difference how much more than… approximate estimate RESOURCES Self-assessment sheet 11.1	• Write the following problem on the board. Three years ago I bought a car for £8425. Last week I sold the car for £2760. How much of a loss is this? **Q** What kind of calculation do we need to do here? What will the answer be approximately? Establish that this is a subtraction calculation and the answer is about £5500. Remind the class of the column method of subtracting by counting up that they have used previously and work through the above problem. 8425 – 2760 40 (up to 2800) 200 (up to 3000) 5000 (up to 8000) 425 (up to 8425) 5665 **Q** Could we do this in fewer steps? • Demonstrate how the calculation could have been done using only two steps: 8425 – 2760 240 (up to 3000) 5425 (up to 8425) 5665 • Emphasise the importance of aligning units, tens, hundreds and thousands. Explain to the children that they should use the smallest number of steps that they feel confident with. • Now give the children subtraction calculations to carry out such as: 5821 – 4567; 7542 – 286; 6467 – 684; 3467 – 1538; 8103 – 4938. Ask the children to work in pairs. They are to agree an estimate to the calculations before working them out. When they finish, tell the pairs to set one another subtraction calculations which they are to do themselves and then they are to compare and confirm the answers.

Plenary

Teaching Activities/Focus Questions

Q How do you know if your answer is correct?

- Discuss responses and establish that their answer should be close to their estimate and if it is not they have should check whether they have made a mistake.
- Ask if anyone obtained an answer that was very different from their estimate. Use these to clarify any errors or misunderstandings.

ASSESSMENT –

- Give out Self-assessment sheet 11.1. Allow time for the children to read and complete the second cloud question.

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

- **Subtract pairs of numbers less than 10 000 using the counting up method;**
- **Use the relationship between addition and subtraction to check answers.**

(Refer to supplement of examples, section 6, page 51.)

Planning sheet	**Day Four**	**Unit 11** ***Addition and subtraction***	**Term:** ***Summer***	**Year Group:** ***5***

Oral and Mental

Objectives and Vocabulary	Teaching Activities
Use known number facts and place value for mental addition and subtraction. Add/subtract a pair of decimal fractions, each with units and tenths or with tenths and hundredths, including crossing the units boundary or the tenths boundary. VOCABULARY add subtract total minus take away difference how much more RESOURCES Whiteboards Large 'slidey box'	• Show the following question using a slidey box: 5.7 + 2.5 = [ ] **Q** How can we use our knowledge of adding together two-digit numbers to help us work out the answer to this calculation? Discuss responses and establish that the digits are the same as in the sum 57 + 25 although the place value of the digits is different, as they are ten times smaller. Ask the children to calculate 57 + 25 and share their strategies. Explain that to find the answer to the original problem we divide 82 by 10 to give us eight units and two tenths, i.e. 8.2. • Repeat using 5.2 – 2.7. • Now give the class a range of slidey box questions some involving addition and subtraction. They are to show their answers using their whiteboards. Include examples such as: 2.4 + [ ] = 8.7 0.95 – [ ] = 0.67 0.63 – 0.48 = [ ]

Main Teaching

Objectives and Vocabulary	Teaching Activities
Use column methods to subtract a pair of decimal fractions, both with one or both with two decimal places. . VOCABULARY subtract minus take away difference how much more RESOURCES Resource sheet 11.1 Activity sheet 11.1 Self-assessment sheet 11.1	• Write the following problem on the board: A year ago a pony weighed 74.65 kg. Its weight is now 57.88 kg. How much weight has it lost? **Q** How can we work out the answer to this problem? What is the approximate answer? Discuss responses and methods offered and agree the answer is about 15 kg. Remind the class of the column method for subtraction that they have used previously. Work through the calculation for the above problem, e.g. 74.65 – 57.88 0.12 (up to 58.00) 2.00 (up to 60.00) 14.65 (up to 74.65) 16.77 • Discuss other possibilities for steps. Emphasise the importance of lining up decimal points and digits under the correct columns, i.e. hundredths, tenths, units, tens. • Give the class two subtraction calculations to carry out. Ensure that these involve decimal fractions with up to three digits. • Collect answers and discuss the children's solutions. • Give out Resource sheet 11.1. Ask the children to work through the problems, recording their calculations in the way they have been shown.

Plenary

Teaching Activities/Focus Questions

• Collect and discuss the children's solutions to the problems and correct any errors or misunderstandings.

HOMEWORK – Activity sheet 11.1. Say that this contains a variety of addition and subtraction questions. The children can do these calculations in any way they like apart from with a calculator. The children should record their method in an appropriate way.

ASSESSMENT –

• Give out Self-assessment sheet 11.1. Allow time for the children to read and complete the third cloud question on the sheet.

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

- **Use column methods to subtract a pair of decimal fractions, both with one or both with two decimal places;**
- **Choose and use appropriate number operations to solve problems and appropriate ways of calculating.**

(Refer to supplement of examples, section 6, pages 51 and 75.)

Planning sheet	**Day Five**	**Unit 11** ***Addition and subtraction***	**Term:** ***Summer***	**Year Group:** ***5***

Oral and Mental		**Main Teaching**		**Plenary**
Objectives and Vocabulary	**Teaching Activities**	**Objectives and Vocabulary**	**Teaching Activities**	**Teaching Activities/Focus Questions**
Use known number facts and place value for mental addition and subtraction. VOCABULARY sum total add take away subtract minus difference how much more than	• Present a range of addition and subtraction questions for the children to answer mentally. Ensure that a variety of vocabulary is used (i.e. sum, total, add, subtract, minus, difference) and include such questions as: **Q** What must be added to 734 to make 800? What must be added to 3.4 to make 4? What is the difference between 800 and 1500? How many more is 136 than 80? How much more is 5.8 than 4.6? • At various stages ask: **Q** How did you do that? Did anyone do it differently?	Choose and use appropriate number operations to solve problems, and appropriate ways of calculating. VOCABULARY sum total add take away subtract minus difference how much more than RESOURCES Resource sheet 11.2 Self-assessment sheet 11.1	• Discuss the previous day's homework. Discuss the methods the children used. **Q** Which questions could you do in your head? Which questions did you do using a written method? Establish why some questions needed a written method. • Tell the children that they are to solve problems that require them to use the methods they have been learning throughout the week. • Give out Resource sheet 11.2. Tell the class that they are to read through each problem and discuss the following questions with their partner. **Q** What operation is required? **Q** What method would be best (mental, mental with jottings, written)? • They should then each use their preferred method to work out the answer. The pairs are to compare their methods and their answers before moving on to the next problem.	• Ask the class which problem they found the most difficult. Discuss responses and establish the calculation needed to answer it. **Q** What estimate could we make for the answer? Agree a class estimate. **Q** What method should we use to solve this problem? Discuss responses. **Q** How can we check the answer? • Discuss suggestions and appropriateness of methods. ASSESSMENT – • Remind the children of the work they have been engaged in over the week. Give out Self-assessment sheet 11.1 and ask them to identify an area of mathematics involving addition and subtraction they want to get better at. **By the end of the lesson the children should be able to:** • **Choose and use appropriate number operations to solve problems, and appropriate ways of calculating.** (Refer to supplement of examples, section 6, pages 82–89.)

37	73	71	65
54	29	81	28
19	63	46	45
39	55	82	61

250	570	650	750
390	350	720	150
850	330	550	670
280	610	430	450

2.5	5.8	6.5	4.2
4.5	3.5	3.7	1.5
8.5	0.6	5.5	1.9
9.4	8.1	6.3	7.5

0.25	0.14	0.65	0.63
0.11	0.35	0.75	0.73
0.85	0.37	0.15	0.89
0.86	0.45	0.27	0.55

1. What is £9.42p subtract £6.78p?

2. A piece of skirting board is 5.38 m long. If a length 2.63 m is cut from this how much is left?

3. I have cycled 4.6 km of a 72.5 km cycle ride. How much further do I have to cycle?

4. A tree is 15.85 m tall. The house it stands next to is 11.39 m high. How much taller is the tree than the house?

5. At the supermarket my shopping bill came to £92.46. Of this £38.83 was for shopping I bought for my mother. How much did I spend on my shopping?

6. Alex's weight was 36.35 kg. One week he gained 1.47 kg, the next he lost 0.78 kg. What is his new weight?

1. The capacity of the local cricket ground is 3500. 2387 tickets for Saturday's match were sold. How many tickets are still available?

2. Which is greater, £3726 + £1438 or £8076 – £2908 and by how much?

3. To send a parcel costs 40p per 30 g. How much would it cost to send a 240 g parcel?

4. Stephen is 1.48 m tall. His Dad is 2.02 m tall. How much will Stephen need to grow to be as tall as his Dad?

5.

Menu	
Hamburger	*£2.45*
Hot Dog	*£1.57*
Chickenburger	*£2.23*
Cola	*96p*
Milkshake	*£1.27*

A group of three friends go to eat. Each has £5 to spend.

Callum buys a hamburger and a cola.

Rebecca buys a chickenburger and a milkshake.

Chan buys a hot dog and a milkshake.

Who spent the most money?

How much did the three friends spend in total?

How much money did each person have left?

1. 538 + 120
2. 742 – 210
3. 3587 + 675
4. £6.72 + £8.56 + £2.30
5. 72.5 km + 54.6 km
6. 7648 + 1486
7. 6.1 – 2.4
8. £5821 – £764
9. £9.42 – £6.21
10. £9.36 – £4.78

My Mathematics

Calculate:
4767 + 3869
using a column method of addition.

My calculation

Show or discuss with a friend

I did this:
on my own ☐
with some help ☐

Calculate:
7328 – 2863
using a column method of subtraction.

My calculation

Show or discuss with a friend

I did this:
on my own ☐
with some help ☐

Calculate:
(i) £6.72 + £8.56 + £2.35

(ii) 63.47 kg – 36.75 kg

My calculation

Show or discuss with a friend

I did these:
on my own ☐
with some help ☐

Name: _____

I want to get better at _____

_____