

# Merseyside Consultants Cluster Group

## Unit 12

Three daily lessons

### Understanding + and – Mental calculation strategies (+ and -) Making decisions, checking results

#### Year 3

Autumn term

### Unit Objectives

#### Year 3

- |   |            |
|---|------------|
| ?? Extend understanding that subtraction is the inverse of addition   | Page 25,29 |
| ?? Say a subtraction statement corresponding to an addition statement and vice versa                                      | Page 35    |
| ?? Find a small difference by counting up from the smaller number   | Page 33    |
| ?? <b>Choose appropriate number operations and calculation methods to solve word problems.</b> Explain and record method. | Page 61    |
| ?? Check subtraction with addition.   | Page 59    |

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:

- ?? Whiteboards
- ?? Digit cards 0-50
- ?? Resource sheet 12.1
- ?? 2 copies of Resource Sheet 12.2 on OHP
- ?? Resource sheets 12.2 (a) – (d)

#### Year 2

### Link Objectives

#### Year 4

- |  |
|--|
| ?? Extend understanding of the operations of addition and subtraction                                  |
| ?? <b>Understand that subtraction is the inverse of addition</b> (subtraction reverses addition)       |
| ?? <b>State the subtraction corresponding to a given addition, and vice versa</b>                      |
| ?? Find a small difference by counting up from the smaller to the larger number                        |
| ?? <b>Choose and use appropriate operations and efficient calculation strategies to solve problems</b> |
| ?? Check with an equivalent calculation  |

- |  |
|--|
| ?? Consolidate understanding of relationship between + and –   |
| ?? Understand the principles (not the names) of the commutative and associative laws as they apply or not to addition and subtraction                          |
| ?? Find a small difference by counting up (e.g. 5003 - 4996)   |
| ?? <b>Choose and use appropriate number operations and appropriate ways of calculating (mental, mental with jottings, pencil and paper) to solve problems.</b> |
| ?? Check with the inverse operation  |

(Key objectives in bold)

Planning sheet	Day One	Unit 12 <i>addition and subtraction</i>	Term: <i>Autumn</i>	Year Group: 3
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/ Focus Questions
VOCABULARY		Extend understanding that subtraction is the inverse of addition  Say a subtraction statement corresponding to an addition statement and vice versa  Check subtraction with addition  VOCABULARY +, add, addition, more, plus, make, sum ,total altogether -, subtract, subtraction, take(away), minus inverse  RESOURCES  Whiteboards Digit cards 0-50	Share the objectives and vocabulary for the lesson with the pupils. Revise the vocabulary associated with addition/subtraction. including inverse. Ask pupils questions to ensure understanding of the vocabulary, e.g.  <u>Q. What is the total of 26 and 9?</u>  <u>Q. What is the sum of 11 and 35?</u>  <u>Q. What is the difference between 22 and 5?</u>  <u>Q. How many less than 28 is 12?</u>  Write a number sentence on the board and ask pupils to think about what other number sentences they could write from this.  $17-9 = 8$  Encourage the following responses, asking pupils to give explanations:  $17- 8 = 9$  $8 + 9 = 17$  $9 + 8 = 17.$  Repeat with other examples. Introduce using ? and ? to stand for unknown numbers, by giving the following example  $13 + 6 = ?$  Ask the pupils how they solved the problem and then start to move the unknown number in to different positions, i.e.  $13 + ? = 19$  $? + 6 = 19$  Ask pupils to justify their answers each time, ensuring that the vocabulary <i>inverse</i> is used. Repeat, if necessary, with other examples.  In pairs, ask pupils to select two digit cards and find the total of the two cards by adding them. Ask pupils to record any other number sentences that they could make using the resulting trio of numbers.	Revisit the objectives and main vocabulary used in the lesson. Give the pupils a selection of numbers, e.g.15, 17, 32, 34 and 49 and ask pupils to write as many different number sentences as they can. As children provide suggestions for number sentences, ask;  Encourage use of inverse operation for checking  Q. How can we check to make sure that the answer is correct?
		<div style="border: 1px solid black; padding: 10px;"> <p><b>By the end of the lesson, children should be able to:</b></p> <p>Extend understanding that subtraction is the inverse of addition</p> <p>Say a subtraction statement corresponding to an addition statement and vice versa</p> <p>Check subtraction with addition</p> <p>(Refer to supplement of examples, section 5, pages 25, 29, 35 and 59.</p> </div>		

Planning sheet	Day Two	Unit 12 <i>Addition and Subtraction</i>	Term: <i>Autumn</i>	Year Group: 3
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/ Focus Questions
VOCABULARY		Find a small difference by counting up from the smaller number	Share the objectives and vocabulary for the lesson with the class. Ask the pupils to calculate <b>8+127</b> and share their method with their partner. Take feedback with the whole class, drawing on methods that reflect the strategy <b>put the larger number first.</b>	Revisit the objectives and vocabulary with the pupils.  Ask
		VOCABULARY  +, add, addition, more, plus make, sum, total altogether method How did you work it out? -, subtract, subtraction, take (away), minus inverse	Next ask pupils to work out mentally 546 – 20, <b>again describing their strategy to their partner. Pupils could use number lines or other jottings to support their calculation, reflecting the counting back from strategy.</b>  <b>As another example, ask pupils to calculate mentally</b> 504-498. This time, draw on explanations from the pupils who use a counting up from strategy.  Ask	Q.Which numbers did you select to make subtraction calculations that you would use a counting up strategy to solve?  <b>Q.Why did you select these numbers?</b>  Ensure that pupils recognise that when two numbers are close together, it is easier to find a difference by counting up, not counting back.
		RESOURCES  Resource sheet 12.1	Q. Why is it easier to count up from 498 to 504, when we are completing this subtraction calculation?  Explain that for this particular calculation it is easier to count up as the numbers are close together.  Give pupils further examples of subtraction calculations where the numbers are close together, encouraging them to use the counting up from strategy.  Ask pupils to complete Resource Sheet 12.1, selecting numbers that they could use to make calculations that would involve using a counting up strategy to solve.	<div style="border: 1px solid black; padding: 5px;"> <p><b>By the end of the lesson, children should be able to:</b></p> <p>?? Find a small difference by counting up from the smaller number</p> <p>(Refer to supplement of examples, section 5, page 33))</p> </div>

<b>Planning sheet</b>	<b>Day Three</b>	<b>Unit 12 Addition and Subtraction</b>	<b>Term: Autumn</b>	<b>Year Group: 3</b>
<b>Oral and Mental</b>		<b>Main Teaching</b>		<b>Plenary</b>
<b>Objectives and Vocabulary</b>	<b>Teaching Activities</b>	<p><b>Choose appropriate number operations and calculation methods to solve word problems.</b> Explain and record method.</p> <p>VOCABULARY</p> <p>+, add, addition, more, plus make, sum ,total altogether</p> <p>-, subtract, subtraction, take(away), minus inverse method how did you work it out</p> <p>RESOURCES</p> <p>2 copies of Resource sheet 12.2 on OHT Resource sheets 12.2(a) – (d)</p>	<p><b>Teaching Activities</b></p> <p><b>Share objectives and vocabulary for the lesson with the class. Write the following problem on the board for the pupils</b></p> <p><b><i>Q. John has 48 stickers in his book. He adds 34 more. How many stickers does he now have?</i></b></p> <p>Read the problem first and encourage the children to estimate an answer. Discuss what operation is needed and emphasise the vocabulary. Emphasise that the problem can be solved through addition of 48 and 34. Ask children to work out the calculation and then invite pupils to offer their methods, working mentally with jottings, e.g. <math>48 + 30 = 78</math> <math>78 + 4 = 82</math></p> <p><b><u>Q.Ask pupils How could we check the result to ensure that it makes sense?</u></b></p> <p>Introduce the problem-solving frame to the pupils, using OHT of Resource Sheet 12.2 working through the above question. again as a class, emphasizing the importance of identification of the calculation required to solve the problem, importance of estimation, checking strategies and whether or not the answer makes sense in the context of the question.</p> <p>Use a similar approach for the second problem.</p> <p><b><i>Q. There are 56 books on a shelf. 27 are taken away. How many books are now on the shelf?</i></b></p> <p>Demonstrate the recording of the problem as children work through the problem together as a class using the problem-solving frame to guide them. Model the checking of calculation by performing an inverse operation and record answers in written form.</p> <p>Children work through problems on Resource Sheet 12.2, using problem-solving frames (a)-(d). As an extension activity, pupils could make up some problems of their own for other members of the class to solve.</p>	<p><b>Teaching Activities/ Focus Questions</b></p> <p>Revisit the objectives and vocabulary for the lesson.</p> <p>Ask the children to explain how they decided which operations to use and invite volunteers to explain their methods. Show alternative approaches for one or two questions and give answers only to the remaining.</p> <p>Draw together the key points to remember from the lesson.</p> <p><b><u>What are the important words?</u></b></p> <p><b><u>What am I being asked to do?</u></b></p> <p><b><u>What operation should I use?</u></b></p> <p><b><u>Estimate first</u></b></p> <p><b><u>Perform calculation</u></b></p> <p><b><u>Check with inverse operation</u></b></p> <p><b>Homework: Ask pupils to make up one or two word problems of their own to try out on other children in the class. Tell the children to practise them on family and check that they know the answers them selves</b></p> <p><b>By the end of the lesson, children should be able to:</b></p> <p>Choose appropriate number operations and calculation methods to solve word problems <b>Explain and record method.</b></p> <p>(Refer to supplement of examples, section 5, pages 62-71).</p>

