

Unit 4 Addition and subtraction

Five daily lessons

Primary
National Strategy

Year 1
Autumn term

Unit Objectives

Year 1

- **Understand the operation of addition and of subtraction (as 'take away', 'difference' and 'how many more to make'), and use the related vocabulary.** Begin to recognise that addition can be done in any order. Begin to use the +, - and = signs to record mental calculations in a number sentence, and to recognise the use of symbols such as □ or Δ to stand for an unknown number.
- Use knowledge that addition can be done in any order to do mental calculations more efficiently. For example: put the larger number first and count on in ones, including beyond 10 (e.g. 7 + 5).
- Choose and use the appropriate number operations and mental strategy to solve problems.

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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 4.1
- Resource sheet 4.2
- Activity sheet 4.1
- Coat hangers and 10 pegs
- Paper plates and biscuits or cubes
- Cloth (e.g. tea towel)
- Cubes
- 5 containers each containing between 5 and 15 counting objects
- Number track (1-20)
- Large 1, 2, 3 dice, and 1, 2, 3 dice for each pair
- Tin and 10 pennies
- 10-sided dice
- Dice with sides labelled 1 or 2
- Bag and counting objects
- Interactive teaching program 'Number Facts' or OHP and 10 counters
- Whiteboards

See also Models and Images Charts:

- Understanding addition and subtraction;
- Addition and subtraction facts to 20.

Link Objectives

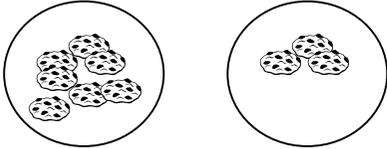
Reception

Year 2

- **Begin to use the vocabulary involved in adding and subtracting.**
- **Begin to relate addition to combining two groups of objects,** counting all the objects.
- Begin to relate addition to counting on.
- **Find one more or one less than a number from 1 to 10.**
- **Begin to relate subtraction to 'taking away',** and counting how many are left.
- **Use developing mathematical ideas and methods to solve practical problems,** including counting and comparing in a real or role-play context.

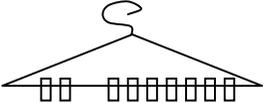
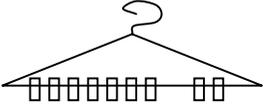
- Extend understanding of the operations of addition and subtraction. Use and begin to read the related vocabulary. Use the +, - and = signs to record mental additions and subtractions in a number sentence, and recognise the use of a symbol such as □ or Δ to stand for an unknown number. Recognise that addition can be done in any order, but not subtraction: for example $3 + 21 = 21 + 3$; but $21 - 3 \neq 3 - 21$.
- **Use knowledge that addition can be done in any order to do mental calculations more efficiently.** For example put the larger number first and count on in tens, or ones, and add three small numbers by putting the largest number first and/or find a pair totalling 10.
- **Understand that subtraction is the inverse of addition** (subtraction reverses addition).
- **Choose and use appropriate operations and efficient calculation strategies** (e.g. mental, mental with jottings) to solve problems.

(Key objectives in bold)

Planning sheet	Day One	Unit 4 Addition and subtraction	Term: Autumn	Year Group: 1
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/ Focus Questions
<p>Know by heart doubles of all numbers to at least 5.</p> <p>VOCABULARY double</p>	<ul style="list-style-type: none"> Hold up two thumbs and say that one add one equals two but another way of saying this is 'double 1'. <p>Hold up two thumbs and two forefingers.</p> <p>Explain that this shows double 2. Ask the children to do the same.</p> <p>Q What is double 2?</p> <p>Next hold up two thumbs, two forefingers and two middle fingers, saying 'double 3 is 6'.</p> <p>Then thumbs, forefingers, middle fingers, and ring fingers saying 'double 4 is 8' and finally all thumbs and fingers saying 'double 5 is 10'.</p> <ul style="list-style-type: none"> Now ask doubles questions randomly. Ask the children to respond by holding up the correct fingers and saying the total. <p>Q Show me double 3. How many is that?</p>	<p>Understand the operation of addition.</p> <p>Begin to recognise that addition can be done in any order.</p> <p>Begin to use the addition sign.</p> <p>VOCABULARY add how many altogether?</p> <p>RESOURCES Coat hanger 10 pegs Cloth Paper plates Biscuits or cubes</p>	<ul style="list-style-type: none"> Clip ten pegs onto a wire coat hanger. Count the pegs as you do so. Separate the pegs, five at one end, five at the other. <p>Q Which double is this? How many pegs altogether?</p> <ul style="list-style-type: none"> Separate the pegs into two sets e.g. 7 and 3. <p>Q How many pegs at this end?</p> <p>Q How many pegs at this end?</p> <p>Q How many pegs altogether?</p> <p>Model recording i.e. $10 = 7 + 3$.</p> <p>Turn hanger round to show $10 = 3 + 7$ and record. Point out that when adding two numbers together, it does not matter which we start with as the total will remain the same.</p> <ul style="list-style-type: none"> Repeat for other addition facts for 10. Cover up two of the pegs with a cloth (e.g. tea towel) <p>Q There are 10 pegs on the coat hanger. How many have I covered up?</p> <p>Ask the children to hold up the number of fingers as there are pegs showing. Point out that the number of fingers folded down is the same as the number of hidden pegs.</p> <p>Record this as $8 + \square = 10$. Agree what goes in the box.</p> <ul style="list-style-type: none"> Repeat with other numbers. Take ten biscuits and split them into two groups. <div style="text-align: center;">  <p>$10 = 7 + 3$</p> </div> <ul style="list-style-type: none"> Provide each pair of children with a paper plate and ten biscuits (or cubes). Ask them to take turns and record of the partitioning of the ten biscuits. They should find as many ways as possible to split them between the two plates. 	<ul style="list-style-type: none"> Ask the children to imagine 6 biscuits on 2 plates. <p>Q How many on each? Can you think of another way? Are there still 6?</p> <ul style="list-style-type: none"> Ask the children to imagine 2 caves and 8 dinosaurs. <p>Q How many might be in each cave?</p> <p>Encourage a range of answers.</p> <p>Say that 7 dinosaurs are in one cave.</p> <p>Q If there are 8 dinosaurs altogether, how many are in the other cave?</p> <p>By the end of the lesson, children should be able to:</p> <ul style="list-style-type: none"> understand addition as combining sets to make a total; record simple mental additions in a number sentence using the + and = signs. <p>(Refer to supplement of examples, section 5, page 24.)</p>

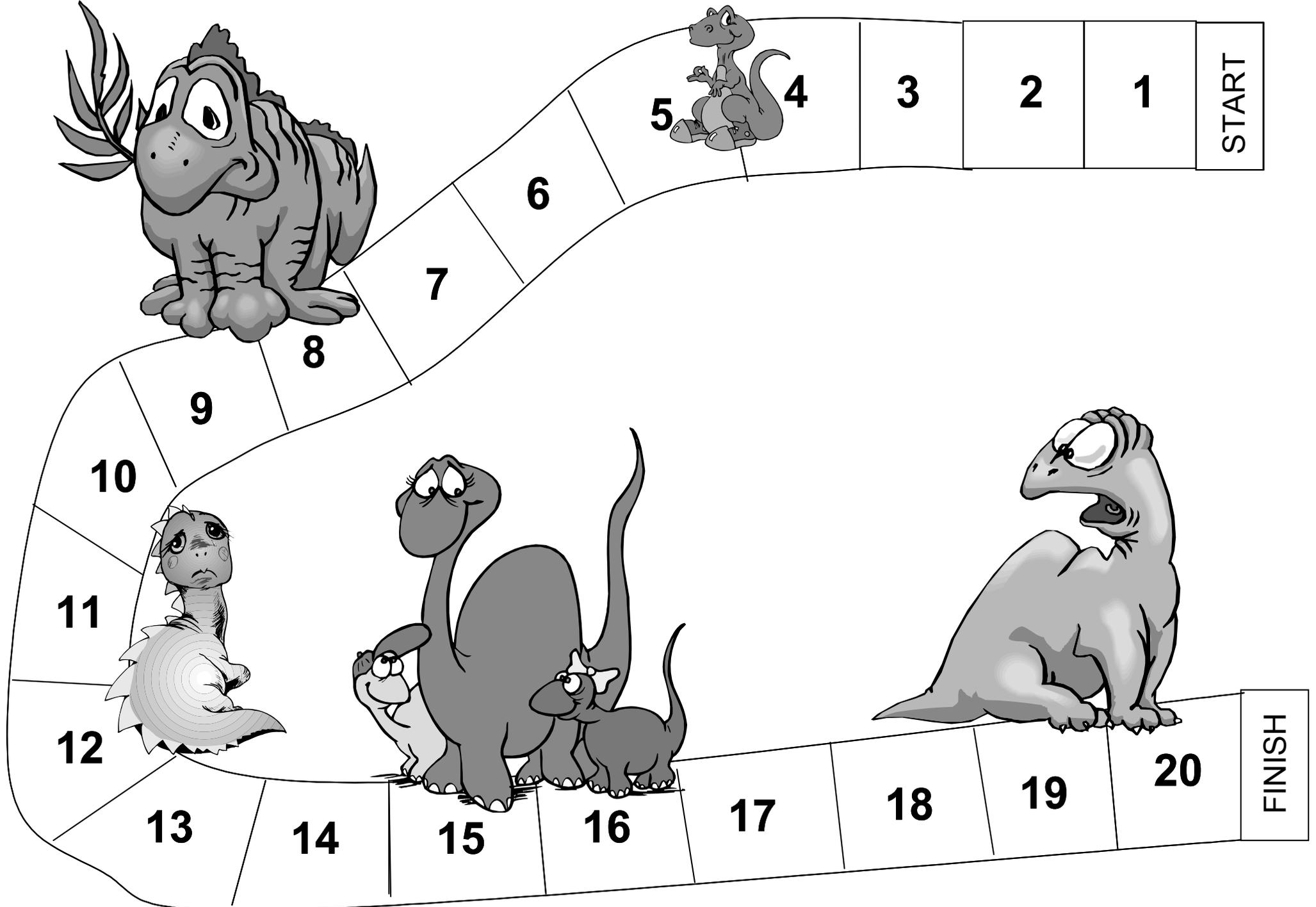
Planning sheet	Day Two	Unit 4 <i>Addition and subtraction</i>	Term: <i>Autumn</i>	Year Group: <i>1</i>
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/ Focus Questions
<p>Know by heart addition facts for all pairs of numbers with a total up to at least 5.</p>	<ul style="list-style-type: none"> Say that you are going to write down all the pairs of numbers that add up to or total 5. <p>Remind the children that they have 5 fingers (including thumb) on each hand. Ask them to hold up one finger.</p> <p>Q How many fingers are down? Up? Altogether?</p> <p>Write $5 = 4 + 1$ on the board.</p> <p>Ask the children to hold up a finger and thumb, repeat the question and record the corresponding number sentence. Continue until you have all the pairs with a total of 5.</p> <ul style="list-style-type: none"> Now hold up three fingers, ask the children to copy and shout out what number goes with 3 to make a total of 5. Repeat for other pairs. 	<p>Understand the operation of addition.</p> <p>Count on in ones.</p> <p>VOCABULARY count on add one more two more</p> <p>RESOURCES 5 containers each with between 5 and 15 objects in them Floor track (1-20) Number track (1-20) Large 1, 2, 3, dice 1, 2, 3 dice for each pair Resource sheet 4.1 Tin and pennies</p>	<ul style="list-style-type: none"> Display five containers (tin, boxes etc.) clearly labelled with numbers in the range 5 to 15 and containing the correct number of objects. <p>Choose one container.</p> <p>Q How many are there in here? How many will there be if I add one more?</p> <p>Encourage children to count on from the first number.</p> <p>Add one more and re-label.</p> <p>Q How many are there in here now? How many will there be if I add two more?</p> <p>Add two more, counting on from number on label, as you do so.</p> <p>Record the corresponding addition on the board e.g. $7 + 2 = 9$.</p> <p>Demonstrate counting on two more on the number track from the same number. For example, counting on 2 from 7 and landing on 9.</p> <ul style="list-style-type: none"> Repeat, using the other containers, adding two each time, encouraging children to count on from the first number. Demonstrate counting on two more on the number track each time. For the last container add three more (children may use their fingers to keep track of the three counted on). Use a 1-20 track. Ask a child to choose a number to stand on. <p>Roll a 1, 2, 3 die. Ask the child to count on the number rolled.</p> <p>Q Where do you think Janine will stop?</p> <ul style="list-style-type: none"> Repeat with other children. <p>Once they are confident, choose numbers greater than ten.</p> <ul style="list-style-type: none"> Give Resource sheet 4.1, a 1, 2, 3 dice to each pair and a counter to each child. <p>Ask children to take turns to roll the dice and move their counter along the track.</p> <p>Q If you are on 18, what number will you need to roll to land on 20?</p>	<ul style="list-style-type: none"> Ask the children to close their eyes. Drop five pennies into a tin, one at a time, asking the children to count them silently as you do so. <p>Q How many pennies are in the tin?</p> <ul style="list-style-type: none"> Ask the children to close their eyes again. Drop another penny into the tin. <p>Q How many are in the tin now?</p> <ul style="list-style-type: none"> This time drop two more pennies into the tin. <p>Q How many did I drop in this time? How many are there altogether in the tin?</p> <ul style="list-style-type: none"> Continue adding one/two pennies at a time until there are ten pennies in the tin. Now take one penny out. <p>Q There were ten pennies in the tin, I've taken one out, how many are left?</p> <p>Establish that there are nine pennies in the tin. Take a penny out.</p> <p>Q How many are left?</p> <ul style="list-style-type: none"> Repeat taking one or two pennies out until there are none left. <p>HOMEWORK – Give each child a copy of Resource sheet 4.1 and ask them to practise the game with someone at home. Say that they should predict where they will land each time.</p> <p>By the end of the lesson, children should be able to:</p> <ul style="list-style-type: none"> understand addition as steps along a number track counting on. <p>(Refer to supplement of examples, section 5, page 24.)</p>

VOCABULARY
pairs
total

Planning sheet		Day Three		Unit 4 <i>Addition and subtraction</i>		Term: <i>Autumn</i>		Year Group: 1	
Oral and Mental			Main Teaching				Plenary		
Objectives and Vocabulary		Teaching Activities		Objectives and Vocabulary		Teaching Activities		Teaching Activities/ Focus Questions	
Know by heart addition facts for all pairs of numbers with a total up to at least 5.		<ul style="list-style-type: none"> Ask the children to discuss in pairs, what two numbers have a total of 4. <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"> Q Is there another pair with a total of 4? </div> <ul style="list-style-type: none"> Collect their responses and write: $0 + 4 = 4$ $1 + 3 = 4$ $2 + 2 = 4$ $3 + 1 = 4$ $4 + 0 = 4$ Ask them to write on their whiteboards as many additions with answers of 1, 2, 3, 4 or 5 as they can. <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"> Q How many can you write in three minutes? </div> <p>Collect responses and record them.</p>		Use knowledge that addition can be done in any order – by putting the larger number first and counting on in ones.		<ul style="list-style-type: none"> Clip 2 pegs on the left of the coat hanger and 7 on the right.  <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"> Q How many pegs are there altogether? How did you work it out? </div> <ul style="list-style-type: none"> Turn the coat hanger round.  <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"> Q How many pegs are there now? </div> <p>Emphasise that the total is the same, whether we find $2 + 7$ or $7 + 2$.</p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"> Q Is it easier to work out 2 and 7 more or 7 and 2 more? </div> <p>Draw out that it is easier to count on a smaller number.</p> <ul style="list-style-type: none"> Roll a 1-10 dice and a dice with 1s and 2s at the same time. Say that you want to add the two numbers together to find the total score. <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"> Q I've rolled 2 and 7. Will it be easier to start with 2 and count on 7 or start with 7 and count on 2? </div> <p>Demonstrate adding the two numbers together by starting with one and counting on the other number, and then the reverse. Reinforce that the answer will be the same.</p> <ul style="list-style-type: none"> Roll the two dice again, agree which number to start with, and then record the number sentence e.g. $8 + 1 = 9$. Ask the children to work in pairs to roll two similar dice, decide how to add them together and record the number sentence, complete with the answer. 		<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> Q What was the biggest score you could get? What two numbers gave you this score? </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> Q What was the smallest score you could get? What two numbers gave you this score? </div> <ul style="list-style-type: none"> Roll the two dice, but don't let the children see the smaller number. <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> Q I've rolled 9 on one of the dice. My score is 10. What was the other number I rolled? </div> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p>By the end of the lesson, children should be able to:</p> <ul style="list-style-type: none"> put the larger number first in order to count on. <p>(Refer to supplement of examples, section 5, page 32.)</p> </div>	
VOCABULARY pair total add		VOCABULARY add total more count on		VOCABULARY add total more count on					
RESOURCES Whiteboards		RESOURCES Coat hanger and 9 pegs 10-sided dice Dice with sides labelled 1 or 2		RESOURCES Coat hanger and 9 pegs 10-sided dice Dice with sides labelled 1 or 2					

Planning sheet		Day Four	Unit 4 <i>Addition and subtraction</i>	Term: <i>Autumn</i>	Year Group: 1
Oral and Mental		Main Teaching			Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/ Focus Questions	
<p>Know by heart all pairs of numbers with a total of 10.</p> <p>VOCABULARY total pair equal add</p> <p>RESOURCES ITP 'Number facts'</p>	<ul style="list-style-type: none"> Use the ITP, 'Number facts' to show pairs with a total of 10, beginning with 5 + 5. <p>●●●●●○○○○○</p> <p>Highlight the first group of five so that they change to yellow. Click the button so that the corresponding number sentence appears.</p> <ul style="list-style-type: none"> Ask children for other pairs that make 10 e.g. 8 + 2. Highlight the last eight and display the number sentence. Repeat until you have found all the pairs. <p>Q If $7 + 3 = 10$, what does $3 + 7 = ?$</p>	<p>Understand the operation of subtraction (as 'take away' and 'how many more to make') and use the related vocabulary.</p> <p>VOCABULARY take away equals</p> <p>RESOURCES Bag Counting objects Activity sheet 4.1 ITP 'Number facts' (or counters on the OHP)</p>	<ul style="list-style-type: none"> Count six objects into a bag. <p>Q How many are there in the bag? How many will there be if I take one out? And if I take another one out?</p> <p>Write $6 - 2 = 4$ on the board. Say that there were six in the bag, you took two out and there were four left. Read the number sentence;</p> <p>'six take away two equals four'</p> <p>Show the four left in the bag.</p> <ul style="list-style-type: none"> Empty the bag and this time count in ten objects. <p>Q How many will there be if I take one away? What if I take two away?</p> <ul style="list-style-type: none"> Record the corresponding number sentences. Use the ITP, 'Number facts' to show $10 - 1$, $10 - 2$, $10 - 3$, (by selecting the subtraction option and dragging the appropriate number into the bin) and the corresponding number sentences. Repeat for $8 - 1$, $8 - 2$, $8 - 3$. Talk through Activity sheet 4.1 and ask the children to complete the questions and then to make up their own questions and answer them. They can cross out the beads if it helps. 	<ul style="list-style-type: none"> Use the ITP 'Number Facts' (or counters on an OHP) to show 9 counters. <p>Q How many more do we need to make 10?</p> <p>Write $9 + \square = 10$ and then agree and fill in the answer.</p> <ul style="list-style-type: none"> Use the ITP to show 8 counters. <p>Q How many more do we need to make 10? What number sentence could write?</p> <ul style="list-style-type: none"> Repeat with other numbers less than 10. <p>By the end of the lesson, children should be able to:</p> <ul style="list-style-type: none"> understand subtraction as 'taking away' and 'how many more to make...' (complementary addition). <p>(Refer to supplement of examples, section 5, page 28.)</p>	

Planning sheet		Day Five	Unit 4 Addition and subtraction	Term: Autumn	Year Group: 1
Oral and Mental		Main Teaching			Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/ Focus Questions	
<p>Know by heart all pairs of numbers with a total of 10.</p> <p>VOCABULARY altogether pairs total add 'how many more to make...?'</p> <p>RESOURCES Coat hanger 10 pegs Cloth (e.g. tea towel)</p>	<ul style="list-style-type: none"> Clip ten pegs on to a coat hanger. <p>Ask a child to push some of the pegs to one side.</p> <p>Q How many pegs are there altogether? How many pegs at this end? What number sentence could we write about this?</p> <p>Record the number sentence.</p> <ul style="list-style-type: none"> Ask for a volunteer to split the pegs to create a different number sentence, and then record this. Take two pegs off the coat hanger whilst the children close their eyes. <p>Ask them to open their eyes.</p> <p>Q How many pegs have I taken away? How many more do I need to put on to make 10?</p> <ul style="list-style-type: none"> Repeat by starting with ten pegs on the coat hanger and removing five whilst the children close their eyes. 	<p>Choose and use number operations and mental strategies to solve problems.</p> <p>VOCABULARY more less altogether left add take away double</p> <p>RESOURCES Resource sheet 4.2</p>	<ul style="list-style-type: none"> Read through each problem on Resource sheet 4.2. <p>After each ask the children whether this is an 'add' or a 'take away' question, and then write the calculation needed on the board.</p> <ul style="list-style-type: none"> Look though the calculations written on the board. <p>Q Are there any questions that you 'just know' the answer to, and don't have to work out?</p> <ul style="list-style-type: none"> Discuss the addition questions. <p>Q Is there an easy way to work out $2 + 5$? Does it matter which way you add them together?</p> <ul style="list-style-type: none"> Ask the children to choose at least five calculations to write in their books and work out the answers. 	<ul style="list-style-type: none"> Ask children to share the answers and discuss how they worked them out. Write $5 + 5 = 10$ on the board. <p>Q What story could go with this number sentence? And another?</p> <ul style="list-style-type: none"> Write $10 - 2 = 8$ on the board. <p>Q What story could go with this number sentence? And another?</p> <ul style="list-style-type: none"> Repeat with other number sentences that they know. <p>By the end of the lesson, children should be able to:</p> <ul style="list-style-type: none"> choose and use number operations and mental strategies in a variety of contexts; make up 'number stories' to reflect number statements. <p>(Refer to supplement of examples, section 5, page 60.)</p>	



1. There are 10 people on a bus. At the next stop 2 more people get on.
How many people are on the bus now?
2. There are 11 people on the bus. 1 gets off at the next stop.
How many are left on the bus?
3. There are 6 children waiting to go down the slide. 2 go down the slide together.
How many are still waiting?
4. A pencil case was £3. In the sale it is £1 less.
How much is it now?
5. 2 children are playing on the roundabout. 5 more come to join them.
How many are there altogether?
6. There are 5 children sitting at one table, and 5 children at another. How many children are there altogether?
7. You roll two dice and get 3 on each dice.
What's the total?
8. You are on number 10 on a number track. You roll the dice and get 2. You move 2 steps.
Which number will you land on?
9. There are 2 pegs at one end of the coat hanger, and 8 at the other.
How many are there altogether?
10. There are 20 birds sitting on a roof. 1 flies away.
How many are left?

Taking away

1.  $7 - 2 = \square$

2.  $7 - 3 = \square$

3.  $10 - 1 = \square$
 $10 - 2 = \square$
 $10 - 3 = \square$

4.  $9 - 1 = \square$
 $9 - 2 = \square$
 $9 - 3 = \square$

5.  $6 - 1 = \square$
 $6 - 2 = \square$
 $6 - 3 = \square$

Now make up some of your own take-away questions.