

Unit 9

Ordering numbers and understanding addition and subtraction

Five daily lessons

Primary National Strategy

This Unit Plan is designed to guide your teaching.

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

Year 1

Autumn term

Unit Objectives

Year 1

Read and write numerals from 0 to at least 20.
Understand and use the vocabulary of comparing and ordering numbers, including ordinal numbers to at least 20. Use the = sign to represent equality. Compare two familiar numbers, say which is more or less, and give a number, which lies between them.
Within the range 0-30, say the number that is 1 or 10 more or less than any given number.
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 understand 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 ? to stand for an unknown number.

Page 8
Page 10

Page 12

Pages 24-28

Reception

Link Objectives

Year 2

Recognise numerals 1 to 9, then 0 and 10, then beyond 10.
Begin to record numbers, initially by making marks, progressing to simple tallying and writing numerals.
Find one more or one less than a number from 1 to 10.
Begin to use the vocabulary involved in adding and subtracting.
Begin to relate subtraction to 'taking away' and counting how many left.

Read and write whole numbers to at least 100 in figures and words.
Say the number that is 1 or 10 more or less than any given two-digit number.
Extend understanding of the operation 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 ? to stand for an unknown number.
Understand that subtraction is the inverse of addition (subtraction reverses addition).

Resources needed to teach this unit:

Interactive teaching program (ITP) 'Counting on or back' or bead string
ITP 'Finding a difference'
ITP 'Number facts' or 10 counters on board or OHP
Activity sheet 9.1
Activity sheet 9.2
Whiteboards
Ten towers of 10 cubes
Washing line and number cards 0-20
Sets of 0-20 cards and 'magic box' or bag (to pull numbers from)
Pennies or counters
Two hoops and two labels: 'more than 10', 'less than 10'
Puppet
Tin
1p and 10p coins
8 plates, cups, bowls, knives, forks, spoons from role play area
Dice (1-6 and 6-10)
Floor dominoes and sets of dominoes
Coat hanger with 10 pegs attached
10 badges or rosettes labelled with the ordinal numbers 1st to 10th
10 soft toys
Number lines 0-20, and 0-30
Copy of the story of 'Snow White'

See Models and Images Charts:
Ordering Numbers to 100;
Counting on and back in ones and tens;
Addition and Subtraction Facts;
Understanding addition and subtraction.

(Key objectives in bold)

Planning sheet	Day One	Unit 9 <i>Ordering numbers and understanding of 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>Read and write numerals to 20.</p> <p>Count on in ones from zero and then back again, then from any small number.</p> <p>Count objects by grouping them in tens.</p> <p>VOCABULARY number names to 20 count on/back ones tens</p> <p>RESOURCES 10 towers of 10 cubes Bead string or ITP 'counting on and back'</p>	<p>Use a bead string or ITP to count on and back in ones. Ask children for start numbers:</p> <p>Q Who can give me a starting number that is less than 8 but more than 2?</p> <p>Show the class the towers of cubes. Ask them to count how many there are in each tower. Establish that there are 10.</p> <p>Use towers to count in tens from 0 to 100.</p> <p>Hold up two towers.</p> <p>Q How many towers?</p> <p>Q How many cubes?</p> <p>Practise writing the number 20 in the air.</p> <p>Hold up 1 tower of 10 cubes and 1 tower of 5 cubes.</p> <p>Q How many cubes are there now? How did you know?</p> <p>Practise writing the number 15 in the air.</p> <p>Repeat with other 'teens' numbers.</p>	<p>Understand the vocabulary of comparing and ordering numbers, including ordinal numbers to at least 20.</p> <p>Compare two familiar numbers, say which is more or less, and give a number which lies between them.</p> <p>VOCABULARY more less bigger smaller larger order number names to 20</p> <p>RESOURCES Washing line and number cards 1-20 Sets of 1-20 cards for each group Pennies or other counters Two hoops Labels: More than 10/Less than 10 Cubes and towers of 10 cubes 'Magic' box or bag (to pull numbers from) Number line 1 to 20</p>	<p>Say that today you are going to put numbers in order and want to use the words larger, smaller, more and less.</p> <p>Arrange the 1 to 20 number cards on the washing line in the wrong order and invite children to help you rearrange them in order starting with the smallest.</p> <p>Q Which is the smallest number? The largest?</p> <p>Q Which number comes after 1?</p> <p>Q Which number comes before 10?</p> <p>Q Which number is 1 more than 13?</p> <p>When the cards are in order count along the washing line from 1 to 20.</p> <p>Choose two children to select two cards from the line.</p> <p>Q Which numbers have they chosen?</p> <p>Q If I gave them each pennies to match their numbers who would have more?</p> <p>Check by giving them pennies and counting with the class how many each has.</p> <p>Q So which is the larger number and which is the smaller?</p> <p>Repeat with other pairs of children.</p> <p>Pick two number cards from the washing line and write the numbers on the board.</p> <p>Q Which is the larger number?</p> <p>Circle the larger number.</p> <p>Arrange sets of number cards 1-20 on each table. Ask the children to turn over two cards write two numbers in their books and circle the larger number. Provide counters for children who wish to use them to match to the numbers on the cards and compare the amounts.</p>	<p>Arrange the class into a circle.</p> <p>Put two set rings or hoops in the middle of the circle with labels. More than 10, Less than 10.</p> <p>Say that you want the children to help you sort the numbers 1-20 into two sets: less/smaller than 10 and more/bigger than 10.</p> <p>Pull number cards out of a box or bag and ask the children, which set the number goes in.</p> <p>Refer to the number line and check by making towers with cubes and checking against a tower of 10.</p> <p>Q Is this number bigger than 10 or smaller than 10?</p> <p>Q Where is it on our number line, before or after 10?</p> <p>Q Is this tower bigger or smaller than my tower of 10?</p> <p>Q What shall we do with the number 10?</p> <p>Agree that this number goes in neither hoop.</p> <p>When the numbers are sorted play a quick game of 'Guess my number'.</p> <p>Q I'm thinking of a number bigger than 10 and less than 15, what could it be?</p> <p>By the end of the lesson, children should be able to: identify the larger and smaller numbers from any two given numbers; identify numbers less than 10 and more than 10.</p> <p>(Refer to supplement of examples, section 5, page 10.)</p>	

Planning sheet	Day Two	Unit 9 <i>Ordering numbers and understanding of 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>Count on in ones from zero and then back again, then from any small number.</p> <p>Within the range 0-30, say the number that is 1 more or less than any given number.</p> <p>VOCABULARY ones count on, count back 1 more 1 less</p> <p>RESOURCES Puppet Tin and pennies</p>	<p>Tell children that the puppet is going to say three numbers and that the children should tell the puppet the next three numbers.</p> <p>Puppet says 15, 16, 17 Children say 18, 19, 20</p> <p>Puppet says 10, 9, 8 Children say 7, 6, 5</p> <p>Repeat, focussing on numbers in the range 0 to 20, counting on and back in ones.</p> <p>Ask the children to close their eyes as you count some pennies into the tin. Ask them to count in their heads the noise as the pennies drop into the tin.</p> <p>Ask children to show you how many pennies are in the tin by holding up the right number of fingers. Now add one more penny into the tin.</p> <p>Q How many are there now?</p> <p>Take one penny out.</p> <p>Q Now there is one less. How much money is in the tin now?</p> <p>Repeat, emphasising vocabulary one more and one less e.g. 'Yes, 6p and 1p more is 7p, 1p less than 5p is 4p'.</p>	<p>Understand the vocabulary of comparing and ordering numbers, to at least 20.</p> <p>Compare two familiar numbers, say which is more or less, and give a number which lies between them.</p> <p>VOCABULARY more less bigger smaller larger order lies between number names to 20</p> <p>RESOURCES Washing line and number cards 0-20 Sets of 0-20 digit cards for each group 'Magic' box or bag 0-20 number lines</p>	<p>Hang number cards 0 to 20 in the right place on a washing line except for 8, 9, 11 and 12 and ask the children to help you put them in the right places.</p> <p>Q Which numbers are missing?</p> <p>Q Which numbers go before 10?</p> <p>Q Which numbers go after 10?</p> <p>Q Which number is 1 more than 10?</p> <p>Q Which number is 1 less than 10?</p> <p>When all the numbers are in place, count along the washing line.</p> <p>Put number cards 0-20 in a 'magic' box or bag. Pull out two numbers.</p> <p>Q Which is the smaller number?</p> <p>Q Which is the larger?</p> <p>Q Imagine you have 8 sweets and 3 sweets, which is more?</p> <p>When the class have established which is larger and which is smaller, write the numbers on the board with the smaller number on left and the larger number on the right.</p> <p>Q What number could go between 3 and 8?</p> <p>Q Imagine a number line with just 3 and 8 on. What numbers are missing in between?</p> <p>Q If you started counting at 3 and finished at 8, what numbers would you have said?</p> <p>When the class have established a number that would go between 3 and 8 write it on the board in between the two numbers.</p> <p>Repeat pulling other cards out of the bag or box, emphasising the vocabulary 'lies between'.</p> <p>Give each group a set of 0-20 cards and ask them to turn over two cards and put them in order of smaller then larger and then to think of a number that lies between. They should write the three numbers in their books in order starting with smallest. Say that if the two numbers are next to one another, they should turn over another card.</p> <p>Provide number lines for those children that need to refer to them. When children are confident, ask them to write all the numbers that lie between their two numbers.</p>	<p>Draw a blank number line on the board.</p> <p>Write 0 at one end and 5 at the other and add markers to show where numbers would go.</p> <p>Q Which numbers are missing? Which numbers lie between 0 and 5?</p> <p>Q Where will the number 4 go? Why?</p> <p>Repeat for other sequences of numbers within the range 0-20 encouraging children to answer in sentences.</p> <p>HOMEWORK – Write down your age, and then ask someone in your home his or her age. Write it down. Then write a number that comes between those numbers.</p> <p>By the end of the lesson, children should be able to: respond to questions such as: Which is less 15 or 19? Which is more 12p or 21p? write a number in the box so the three numbers are in order: 2 ? 7.</p> <p>(Refer to supplement of examples, section 5, page 10.)</p>	

Planning sheet		Day Three	Unit 9 <i>Ordering numbers and understanding of 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>Count on in ones from zero and then back again, then from any small number.</p> <p>Within the range 0-30, say the number that is 1 more or less than any given number.</p> <p>Read and write numerals to 20.</p> <p>VOCABULARY count on/back ones 1 more 1 less number names</p> <p>RESOURCES Bead string or ITP 'Counting on and back' Whiteboards/pens</p>	<p>Count in ones from 0 to 30 using a bead string or the ITP. Stop at a number and ask:</p> <p>Q Which number is 1 more than this number?</p> <p>Q Which number is 1 less than this number?</p> <p>Encourage the children to respond in whole sentences using the vocabulary e.g. 5 is 1 less than 6.</p> <p>Repeat stopping at other numbers and encourage children to answer in sentences.</p> <p>Give out whiteboards to individuals or pairs of children.</p> <p>Use hands to 'throw' teens numbers at class (using two hands as 10 and single fingers as ones).</p> <p>Ask children to write down the number you have thrown them on their boards.</p>	<p>Within the range 0-20, say the number that is 1 or 10 more or less than any given number.</p> <p>VOCABULARY number names 10 more than count on</p> <p>RESOURCES Washing line and number cards 1-20 Soft toy Tower of 10 cubes and single cubes Activity sheet 9.1 ITP 'Counting on and back' or bead string Bag 1p and 10p coins 0-30 number lines</p>	<p>Ask a few children to share their pairs of ages from the homework. Ask children to think of other numbers in between the ages, and show where these are on the washing line.</p> <p>Count along the number cards on the washing line from 1 to 20.</p> <p>Turn the number cards on the washing line around so that the numbers are hidden.</p> <p>Choose a single digit number (5) and ask for a volunteer to find it.</p> <p>Q Who can count along the number line and turn around 5?</p> <p>Ask for a volunteer to come up and find the number that is 10 more than 5.</p> <p>Q How can we find the number that is 10 more than 5?</p> <p>Establish that we can count on ten. Ask a volunteer to count on 10 along the washing line using a soft toy such as a frog or kangaroo. Ask the child to turn over the card they land on.</p> <p>Q Which card has been turned over? Is that the right card?</p> <p>Q So which number is 10 more than 5?</p> <p>Write the number sentence on board $3 + 10 = 13$, saying 3 add 10 equals 13 and 3 and 10 more is 13.</p> <p>Also show that the statement is true by adding 3 cubes onto a tower of 10 cubes and vice versa.</p> <p>Repeat the whole process for other single digit numbers. After a couple of numbers ask children to start predicting the number that is 10 more, encouraging them to count on in their heads and to see the pattern.</p> <p>Choose a number between 10 and 20, say 15.</p> <p>Q How could we add 10 on to 15?</p> <p>Establish that we can count on 10 on the number line. Repeat for other 'teens' numbers, asking children to predict the answer and encouraging them to see the pattern.</p> <p>Ask the children to choose six numbers between 1 and 20. Write them on Activity sheet 9.1 and add 10 to them.</p>	<p>Using a bag and 10p and 1p coins, ask the children to watch and count as you put an amount into the bag.</p> <p>Add another 10p or 1p.</p> <p>Q Who can tell me how much I have in my bag now?</p> <p>Use the ITP or bead string to show adding 10 to different numbers.</p> <p>By the end of the lesson, children should be able to: respond to questions such as: What is 10 more than 6? What is 10p more than 7p?</p> <p>(Refer to supplement of examples, section 5, page 12.)</p>	

Planning sheet		Day Four	Unit 9 <i>Ordering numbers and understanding of 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>Count reliably at least 20 objects.</p> <p>Know by heart all pairs of numbers with a total of 10.</p> <p>VOCABULARY how many? add</p> <p>RESOURCES Number cards 1 to 20 Whiteboards ITP 'Number facts' or 10 counters on board or OHP</p>	<p>Select a volunteer and give them a number card so that the other children can't see the number. Ask them to do that number of wing flaps.</p> <p>Q What was the number I gave her?</p> <p>Ask children to respond by writing the number on their whiteboards.</p> <p>Repeat, using other actions (jumping, patting head, clapping).</p> <p>Use the ITP 'Number facts' to practise addition facts for 10 (or use counters on OHP).</p> <p>Start with ten counters, highlight (or separate) the first one and ask children to say the number sentence $1 + 9 = 10$. When they have done so click on number sentence box to display the sentence.</p> <p>Repeat for other pairs that total 10 asking children to predict the number sentence each time.</p>	<p>Understand the operation of subtraction (as 'difference' and 'how many more to make') and use the related vocabulary.</p> <p>VOCABULARY how many? difference between how many more? subtract</p> <p>RESOURCES Copy of the story of Snow White 8 plates, cups, bowls, knives, forks and spoons from the role play area Dice (1-6 and 6-10) Interlocking cubes ITP 'Finding a difference'</p>	<p>Remind the children of the story of Snow White.</p> <p>Q Snow White has to lay the table for dinner for herself and the seven dwarves. How many plates will she need? How many bowls? How many knives? How many forks? How many spoons?</p> <p>Establish that she will need 8 of each, one for each of the dwarves and one of each for herself.</p> <p>Say that you are going to help Snow White by counting for her. Show the children a box (containing 8 plates, 4 knives, 8 forks, 6 bowls, 3 spoons). Ask for a volunteer to count out 8 plates. Ask for another child to count out the forks and lay them in a line. Ask the same child to count out the knives and lay them in a line above the forks.</p> <p>Q How many forks are there? How many knives are there? Have we got enough knives? Oh dear, Snow White needs some more, what is the difference between 8 and 4? How many more knives do we need?</p> <p>Match up the knives and forks and count on from the 4th knife to establish that we need 4 more knives to match the number of forks.</p> <p>Say that you could write this as a number sentence. Write on the board $8 - 4 = 4$, saying 8 subtract 4 is 4 or the difference between 8 and 4 is 4, or $4 + ? = 8$.</p> <p>Send a child to collect 4 more knives from the role play area.</p> <p>Repeat this process for bowls and spoons.</p> <p>Q How many bowls are there? How many spoons are there? How many more spoons do we need? What is the difference between 8 and 3?</p> <p>Record as a number sentence on board and send another child to collect the extra spoons or bowls.</p> <p>Say that you have been finding the difference between sets of objects and that the children are now going to do that with a partner. Give each pair two numbered dice and about 20 cubes each. Ask them to take turns to each roll the two dice and to make matching towers of cubes and then to find the difference between their two towers. Demonstrate the activity by lining the two towers up and breaking off the cubes from the top of the taller tower until it is the same height as the shorter tower. Say 'The difference between 6 and 3 is 3'. As you visit each pair encourage them to say the number sentence using words 'the difference between'. When the children are confident ask them to record the subtraction sentences in their books.</p>	<p>Use the ITP 'Finding a difference' to reinforce the concept of finding the difference. Select 12 and 15 counters. Click the play button so that the two rows of counters slide on top of one another.</p> <p>Q How many extra counters were in the longer line? What is the difference between 12 and 15?</p> <p>Click so that the two number lines appear and then slide over each other.</p> <p>Q How many do we count on from 12 to 15?</p> <p>Show the hops on the line.</p> <p>Repeat for another pair of numbers.</p> <p>By the end of the lesson, children should be able to: understand subtraction as finding the difference between and 'how many more to make...'; respond to questions such as: What is the difference between 14 and 12?</p> <p>(Refer to supplement of examples, section 5, page 28.)</p>	

Planning sheet		Day Five	Unit 9 <i>Ordering numbers and understanding of 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>Use ordinal numbers to tenth.</p> <p>VOCABULARY order first second third... tenth</p> <p>RESOURCES 10 badges or rosettes labelled with the ordinal numbers 1st to 10th. 10 soft toys</p>	<p>Show the children badges with 1st, 2nd, 3rd... 10th on them.</p> <p>Ask four children to make a line at the door.</p> <p>Q Who is 1st in the line?</p> <p>Q Who is 2nd? 3rd? 4th?</p> <p>Give out the remaining badges to six children and ask them to line up in the right order by the door behind the other four. Ask them to cover their badges. Point to a child.</p> <p>Q Which badge do you think she has?</p> <p>Point to the next child.</p> <p>Q Which badge do you think he has?</p> <p>Sit the children back in a circle and lay out a queue of soft toys (all different) and ask the children to label them with the ordinal number badges.</p> <p>Q Which toy is 6th in our line?</p> <p>Q Where is teddy in our line?</p> <p>Reinforce this throughout the day: every time a queue forms use the opportunity to use the badges to reinforce the ordinal words.</p>	<p>Understand the operation of addition.</p> <p>Begin to understand that addition can be done in any order. Begin to use the + and = signs to record mental calculations in a number sequence.</p> <p>VOCABULARY add together sum total equals</p> <p>RESOURCES Activity sheet 9.2 Floor dominoes A set of dominoes for each group Coat hanger with 10 pegs attached</p>	<p>Sit children in a circle and lay out the floor dominoes on the carpet (alternatively spread lots of dominoes on the carpet in front of groups of children).</p> <p>Ask the children to find all the dominoes with a total of six spots.</p> <p>When all the dominoes with six spots have been sorted, move the other dominoes to one side.</p> <p>Say that you are going to check their counting. Select the domino with four spots on the left and two on the right.</p> <p>Q Look at this domino. How many spots does it have on this side?</p> <p>Q How many on this side?</p> <p>Q So how many spots altogether?</p> <p>Write the number sentence on the board, $4 + 2 = 6$, saying 4 add 2 equals 6 altogether. Draw the domino above the sentence. Now turn the domino round so that the two spots are on the left.</p> <p>Q What number sentence can we write now? Is it the same as before?</p> <p>Write the number sentence on the board, $2 + 4 = 6$, saying 2 add 4 equals 6 altogether.</p> <p>Stress that it does not matter which way we add the two numbers we will still get the same total.</p> <p>Repeat for $1 + 5$ and $5 + 1$ and $0 + 6$ and $6 + 0$. Ask children to write the number sentences on the board.</p> <p>Ask children to work in pairs to find all the dominoes with a total of seven spots on their table and to record them by drawing them on Activity sheet 9.2. As you work with different groups of children encourage them to say and write the number sentences to go with the dominoes.</p> <p>When children are confident, ask them to write the number sentences next to the dominoes.</p> <p>Repeat asking the children to find all the dominoes with eight spots.</p>	<p>Write 7 in the middle of the board.</p> <p>Ask children for pairs with a total of 7 to write around the 7.</p> <p>Q Alfie has just given us $1 + 6$, what other number sentence uses the same numbers?</p> <p>Show children the coat hanger, establish that there are ten pegs on it. Slide six to one end.</p> <p>Q What number sentence for 10 can you see?</p> <p>Turn the coat hanger round.</p> <p>Q What number sentence can you see now? Are there still 10?</p> <p>Repeat process for other pairs of numbers on the coat hanger.</p> <p>By the end of the lesson, children should be able to: understand addition as combining sets to make a total; understand that $2 + 5$ equals $5 + 2$.</p> <p>(Refer to supplement of examples, section 5, page 24.)</p>	