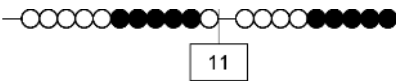


## Counting, partitioning and calculating

<b>Objectives</b>
<b>End-of-year expectations (key objectives) are highlighted</b>
<ul style="list-style-type: none"> <li>Describe ways of solving puzzles and problems, explaining choices and decisions orally or using pictures</li> </ul>
<ul style="list-style-type: none"> <li>Count reliably at least 20 objects, recognising that when rearranged the number of objects stays the same; estimate a number of objects that can be checked by counting</li> </ul>
<ul style="list-style-type: none"> <li>Compare and order numbers, using the related vocabulary; use the equals (=) sign</li> </ul>
<ul style="list-style-type: none"> <li><b>Read and write numerals from 0 to 20, then beyond; use knowledge of place value to position these numbers on a number track and number line</b></li> </ul>
<ul style="list-style-type: none"> <li>Say the number that is 1 more or less than any given number, and 10 more or less for multiples of 10</li> </ul>
<ul style="list-style-type: none"> <li>Relate addition to counting on; recognise that addition can be done in any order; use practical and informal written methods to support the addition of a one -digit number or a multiple of 10 to a one-digit or two-digit number</li> </ul>
<ul style="list-style-type: none"> <li>Understand subtraction as 'take away' and find a 'difference' by counting up; use practical and informal written methods to support the subtraction of a one -digit number from a one-digit or two-digit number and a multiple of 10 from a two-digit number</li> </ul>
<ul style="list-style-type: none"> <li><b>Use the vocabulary related to addition and subtraction and symbols to describe and record addition and subtraction number sentences</b></li> </ul>

## Starters

1	<b>Counting a number of objects</b> <span style="float: right;"><i>Rehearse</i></span> <p><b>Objective:</b> Count reliably at least 20 objects, recognising that when rearranged the number of objects stays the same; estimate a number of objects that can be checked by counting</p> <p>Use a glove puppet or other soft toy to 'count' objects from a bag. Ask children to listen carefully as the puppet makes mistakes with counting. You might repeat numbers, omit numbers, or use the wrong number names. Tell children to put up their hands when the puppet makes a mistake. Ask them to identify the mistakes and help to put them right. Repeat several times.</p> <ul style="list-style-type: none"> <li>What sort of things can the puppet do to make sure that the count is correct? (e.g. arrange the objects in a line before counting them, or move them to one side as they are counted)</li> </ul> <p>Beat on a drum or tambourine. Support children in counting the beats together. Ask them to count quietly or silently and to shout out the last number. Confirm the number of beats and point to the number on a display such as a washing line or large number line. Repeat several times.</p> <ul style="list-style-type: none"> <li>When you were counting quietly, what helped you to keep track of the beats?</li> </ul>
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2	<b>Counting on and back in ones using a bead string</b>	<i>Recall</i>
	<p><b>Objective:</b> Say the number that is 1 more or less than any given number, and 10 more or less for multiples of 10</p> <p>Use a bead string. Moving one bead at a time, ask children to count in their heads to keep a count of the number of beads that are moved. Hang a tag after the number of beads counted.</p>  <p>Now start from the labelled position, moving one bead at a time, and asking children to count on aloud.</p> <p>Start again by moving, say, five beads. Label them with a tag.</p> <ul style="list-style-type: none"> <li>• If I move one more bead along, how many beads will there be?</li> </ul> <p>Say that there is one more bead. Ask children to say together: 'One more than five is six.'</p> <ul style="list-style-type: none"> <li>• If I move back one bead, how many beads will there be?</li> </ul> <p>Say that this time there is one less bead. Ask children to say together: 'One less than six is five.'</p> <p>Repeat, starting with a different number of beads.</p>	
3	<b>Reading and ordering 'teen' numbers</b>	<i>Read and refine</i>
	<p><b>Objective:</b> Read and write numerals from 0 to 20, then beyond; use knowledge of place value to position these numbers on a number track and number line</p> <p>Use cards numbered 10 to 20, two or three of each number.</p> <p>Give each child a number card. Ask children to get up and find other children with the same number card and form a group. Point to each pair or group with the same number card and ask them to say their number in a silly voice or like a lion or a mouse.</p> <p>Hold up a card with a number in the range 10 to 20. The whole class is to read the number and the group with that number sits down. Repeat until the whole class is seated.</p> <p>Say you will again hold up a card. If a group has the number that is one more or one less than the number, that group is to stand up if they are seated or sit down if they are standing. Show a card in the range 11 to 19. Ask the whole class to read the number together. Check that the right groups sit down or stand up.</p> <p>Repeat until every group has changed at least once from sitting to standing or vice versa.</p> <p>In random order, choose seven children holding the numbers 12 to 18 inclusive. Ask the seven children to arrange themselves in order from the smallest number to the largest. Involve the rest of the class in helping to ensure that the order is correct.</p>	

## Main activities

1	<b>Exploring combinations of numbers that make five</b>
	<p><b>Objective:</b> Describe ways of solving puzzles and problems, explaining choices and decisions orally or using pictures</p> <p>Use six toys from the classroom and have ready a cloth large enough to cover them all. Show children the toys. Agree that there are six. Cover the toys with the cloth.</p> <ul style="list-style-type: none"> <li>• How many toys are under the cloth?</li> </ul> <p>Make sure that all children agree that there are six toys.</p>

	<p>Now take two toys out from under the cloth.</p> <ul style="list-style-type: none"> <li>• How many toys are hidden?</li> </ul> <p>Agree there are four toys hidden. With the class, confirm by counting on that four hidden toys and two toys that can be seen make the six toys we started with.</p> <p>Repeat several times with different numbers and various combinations of toys hidden and seen. Avoid hiding and revealing the same toys.</p> <p>Give each pair of children five small toys and a yogurt pot or similar container. Tell each pair to count their toys and then hide them under the pot. All agree how many toys are under each pot. Ask children to take turns to hide secretly some of the five toys under the pot. Their partner must identify how many of the five toys are hidden.</p> <p>Ask children how they know how many toys are hidden. Prompt answers such as: 'I could see three so I counted on my fingers to five' or 'I counted up from three'.</p> <p>When pairs become confident, give them more small toys to use, e.g. 10 toys.</p> <hr/> <p><b>Review</b></p> <p>With the class, take feedback on and display all the possible ways of hiding five toys. Each time, ask children to describe the situation in words. Include cases where all toys are hidden and no toys are hidden. At various points, ask children if all the ways have been collected and encourage them to be more systematic in their approach. Keep a record on a flipchart or interactive whiteboard:</p> <ul style="list-style-type: none"> <li>0 and 5</li> <li>1 and 4</li> <li>2 and 3</li> <li>3 and 2</li> <li>4 and 1</li> <li>5 and 0</li> </ul> <p>Now ask children to generate all cases for the six toys used at the start of the lesson.</p>
2	<p><b>Reading and writing numerals</b></p> <p><b>Objective:</b> Read and write numerals from 0 to 20, then beyond; use knowledge of place value to position these numbers on a number track and number line</p> <p>Use a set of large cards numbered 0 to 10. Show them to children in random order, saying, for example, 'This says eight'.</p> <p>Hold up one of the cards. Tell children that you want them to answer together as you ask questions. Then ask:</p> <ul style="list-style-type: none"> <li>• What does this card say?</li> </ul> <p>Repeat with the other cards in random order.</p> <p>Ask children to close their eyes and imagine the number 6. Ask them to open their eyes and watch you draw the number in the air using a finger puppet.</p> <ul style="list-style-type: none"> <li>• Is this the picture you saw in your head?</li> <li>• Can anyone come and write the number on the board?</li> </ul> <p>Demonstrate how to write the number on the board. Ask children to follow your movements by writing in the air and then on a partner's back.</p> <p>Repeat with some other numbers, including 3, 5 and 8.</p> <p>Take 10 plant pots filled with compost, and some seed. Explain that you are going to plant a different number of seeds in each pot, and see how many come up. Plant one seed in</p>

	<p>the first pot, two in the second, three in the third, and then stop.</p> <ul style="list-style-type: none"> <li>How will we remember how many seeds we planted in each pot?</li> </ul> <p>Encourage children to suggest labelling each pot with the number of seeds planted in it. Ask children to help you to label each of the ten pots and plant the right number of seeds in them. Shuffle the pots and ask children to help you to put them in order, starting with the smallest number.</p> <ul style="list-style-type: none"> <li>Which pot has the least number of seeds in it?</li> <li>Which pot will be first?</li> <li>Which pot will be last?</li> </ul> <p>Give each pair of children a plastic cup to take to their table where there are sticky notes/labels and a container of small objects for counting.</p> <p>Ask one child from each pair to put a handful of objects into the pot, count them and label the pot with the number of objects. Ask the other child to check. Repeat as time allows.</p> <hr/> <p><b>Review</b></p> <p>Play 'Behind the wall'. Slowly reveal a large number card from behind a screen. Initially use numbers to 10. If appropriate, extend to numbers to 20.</p> <ul style="list-style-type: none"> <li>What number do you think that this could be?</li> </ul> <p>Ask children to respond by writing the number on their whiteboards.</p> <ul style="list-style-type: none"> <li>What else could it be? Could it be ...? What can't it be?</li> </ul> <p>Repeat several times.</p>
3	<p><b>One more and one less</b></p> <p><b>Objective:</b> Say the number that is 1 more or less than any given number, and 10 more or less for multiples of 10</p> <p>Introduce 'one more' and 'one less' using a large dice (a dice with attachable and removable spots would be ideal). Show one face and agree how many spots there are on it. Add or remove one spot at a time, first asking children to visualise and predict the new number. Repeat several times.</p> <ul style="list-style-type: none"> <li>Imagine one more spot. How many will there be?</li> <li>Imagine one less spot. How many will there be?</li> </ul> <p>Encourage children to talk about the spots in sentences such as: 'Four is one more than three.'</p> <p>Make sure that all children can see a number line from 0 to 20.</p> <p>Show children an empty tin and ask them to close their eyes. Drop five pennies, one by one, into the tin. Ask children to keep count by listening as the pennies drop. Establish the number of pennies in the tin. Confirm this by showing the class the five pennies.</p> <ul style="list-style-type: none"> <li>How many pennies are in the tin?</li> </ul> <p>Put the coins back in the tin and show them one more penny.</p> <ul style="list-style-type: none"> <li>If I drop this one in the tin, how many will there be?</li> </ul> <p>Establish that there are now six pennies in the tin by saying: 'Five in the tin and one more makes six.' Continue: 'Six in the tin and one more makes seven.' 'Seven in the tin and one more makes eight.' Each time, refer to the number line.</p> <p>Repeat, starting with a different number of pennies in the tin and adding three more pennies one at a time.</p>

	<p>Move on to 'one less', this time removing one penny at a time: 'Six pennies are in the tin. One less [taking one out] leaves five.' Take out two more pennies, one a time. Refer again to the number line. Repeat with a different starting number.</p> <p>If appropriate, extend the task by putting more than 10 pennies in the tin.</p> <p>Show children how to play this game in pairs. Give a copy of Resource 1A1.1 to each pair. Each pair needs a plastic cup (or similar) and a collection of counting objects such as beads. They also need a sheet of paper divided into three columns.</p> <p>The first child rolls a spot dice and places that number of beads, one at a time, into the cup. In the middle column of the paper, they draw the number of beads in the cup and write the corresponding numeral.</p> <p>The second child takes one bead from the cup, and says how many toys are now in the cup. In the first column of the paper, they draw the number of beads now in the cup and write the corresponding numeral.</p> <p>Children replace the bead and confirm that the number of beads is again as in the middle column. The first child adds one more bead to the cup. In the third column of the paper, they draw the number of beads now in the cup and write the corresponding numeral.</p> <p>It is now the second child's turn to go first and to roll the dice. If they roll the same number, they should roll the dice again.</p> <hr/> <p><b>Review</b></p> <p>With the whole class, return to the pennies and tin. Say that you have four pennies. Drop them in the tin. Ask:</p> <ul style="list-style-type: none"> <li>• If I take one penny out of the tin, how many pennies are left?</li> <li>• If I add one penny to the tin, how many pennies will be in the tin?</li> </ul> <p>Remove the tin. Say that you want children to imagine the tin with six pennies in it. Ask the questions above again.</p> <p>Repeat once more. This time, make no mention of the tin or pennies, but ask:</p> <ul style="list-style-type: none"> <li>• What is one more than seven? What is one less than seven?</li> </ul> <p>Encourage children who need support to refer to the displayed number line.</p>
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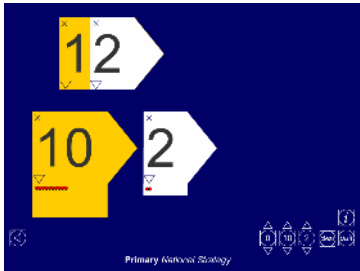
### Six more lessons consolidating the above and extending to:

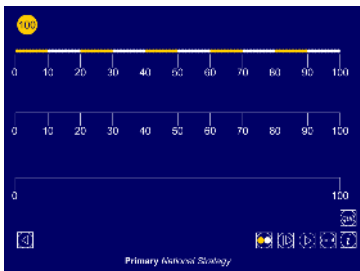
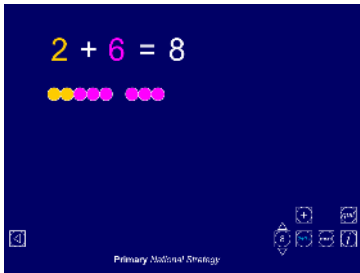
a	<b>Relating addition to counting on; using practical methods to support addition of a one-digit number or a multiple of 10 to a one-digit or two-digit number</b>
b	<b>Understanding subtraction as 'difference'; using practical methods to support subtraction of a one-digit number or multiple of 10 from a two-digit number</b>
c	<b>Solving problems and recording addition and subtraction number sentences</b>

## Counting, partitioning and calculating

<b>Objectives</b>
<b>End-of-year expectations (key objectives) are highlighted</b>
<ul style="list-style-type: none"> <li>Solve problems involving counting, adding, subtracting, doubling or halving in the context of numbers, measures or money, for example to 'pay' and 'give change'</li> </ul>
<ul style="list-style-type: none"> <li>Describe ways of solving puzzles and problems, explaining choices and decisions orally or using pictures</li> </ul>
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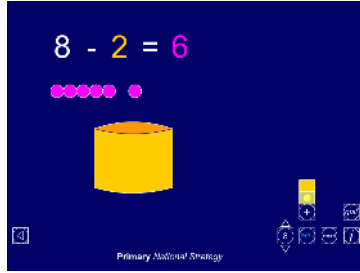
## Starters

1	<p><b>Reading and writing 'teen' numbers</b> <span style="float: right;"><i>Refine</i></span></p> <p><b>Objective:</b> Read and write numerals from 0 to 20, then beyond; use knowledge of place value to position these numbers on a number track and number line</p> <p>Tell children they are going to practise counting and recognising numerals. Using a bead string, count from 1 to 20 with the class, moving one bead at a time. Count back from 20, moving beads back again one at a time.</p> <p>Slide 12 beads to one side.</p> <ul style="list-style-type: none"> <li>How many beads are there? Did you have to count them all? Why not?</li> </ul> <p>Stress that there are 10 beads and 2 beads to make up the 12 beads. Reinforce using place value cards, for example using the ITP 'Place value'.</p>  <p>Repeat with 14 beads and 11 beads.</p> <p>Ask children to close their eyes and imagine the number 12. Ask them to open their eyes</p>
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	<p>and watch you draw the numeral in the air using a finger puppet.</p> <ul style="list-style-type: none"> <li>Is this the picture you saw in your head?</li> <li>Can anyone come out and write the number on the board?</li> </ul> <p>Demonstrate how to write 12 on the board. Ask children to follow your movements by writing in the air and then on a partner's back. Use the bead string to reinforce the idea of ten and then additional ones. Repeat with 14 and 11.</p>
2	<p><b>Ordering numbers 1 to 30</b> <span style="float: right;"><i>Rehearse</i></span></p> <p><b>Objective:</b> Compare and order numbers, using the related vocabulary; use the equals (=) sign</p> <p>Use a 100-bead string or the ITP 'Ordering numbers' to count in tens, moving 10 beads at a time.</p>  <p>Pause the ITP at the point when it labels the multiples of 10 (or write them on a blank number line on the board). Ask children to suggest a number that lies between two multiples of 10, such as 20 and 30.</p> <p>Confirm the numbers that lie between 20 and 30 by counting in ones from 20 to 30 moving one bead at a time.</p> <p>Repeat, asking children for other numbers between two multiples of 10.</p> <ul style="list-style-type: none"> <li>I am thinking of a number that lies between 50 and 60. What could it be?</li> <li>I am thinking of a number more than 10 but less than 30. What could it be?</li> </ul>
3	<p><b>Recording addition and subtraction sentences</b> <span style="float: right;"><i>Refine</i></span></p> <p><b>Objective:</b> Use the vocabulary related to addition and subtraction and symbols to describe and record addition and subtraction number sentences</p> <p>Use the ITP 'Number facts' to practise addition facts for 8 (alternatively use counters on the OHP or interactive whiteboard).</p> <p>Start with eight counters. Highlight the first one and ask children to say the number sentence <math>1 + 7 = 8</math>. (If you are using counters on an OHP, move the first counter to one side.) Click on the number sentence box to display the sentence (or write it on the OHT).</p> <p>Highlight another counter to show <math>2 + 6 = 8</math> and so on.</p>  <p>Start with eight counters again. Select subtraction. Deselect the number sentence option and drag two counters into the bin on the screen. Ask children to write the number</p>

sentence on their whiteboards.

Now select the number sentence option to display  $8 - 2 = 6$ .



- What number sentence would you have written if I had put the red counters in the bin instead of the yellow counters?

Draw out that this would be  $8 - 6 = 2$ .

Encourage children to explain a number sentence such as  $8 - 3 = 5$  as: 'I have 8 counters. I put 3 in the bin. I have 5 left.'

Repeat for other subtraction facts about 8.

## Main activities

1

### Solving problems involving totals to 10

**Objective:** Solve problems involving counting, adding, subtracting, doubling or halving in the context of numbers, measures or money, for example to 'pay' and 'give change'

**Objective:** Describe ways of solving puzzles and problems, explaining choices and decisions orally or using pictures

Show an OHT made from Resource 1A2.1 of a bus with 20 windows.

Say that 8 people will be getting on the bus. Show the 8 counters to represent people.

Invite a child to come and arrange the counters on the bus.

- How many people has Rebecca put on the lower deck of the bus? How many people has she put on the top deck? So how many people are on the bus altogether?

Say: 'Six are on the lower deck. Add on two more. That makes eight.' Hold up six fingers and count on from six, saying 'seven, eight'.

Model the addition on a number line. Start on 6 and jump on 2. Write on board:  $8 = 6 + 2$ .

Invite another child to rearrange the eight counters, to find a different way of arranging the eight people.

- How many people has Nazeem put on the lower deck? (e.g. 5) How many on the top? (3) How can we check that there are still eight people on the bus?

Point to the five on the lower deck and hold up three fingers, saying: 'Three more people, six, seven, eight.'

- If I put my finger on 5 on the number line and jump on 3, what number will I land on?

Ask children to look at the number line. Invite a child to come and start on 5 and jump on 3. Write on the board:  $8 = 5 + 3$ .

Repeat for other arrangements.

Give each child a copy of Resource 1A2.1 and 10 counters. Ask them to arrange the 10 counters on the bus in different ways. They should write each different way as a number sentence in their books.



	<p><b>Review</b></p> <p>Write on the board: <math>7 + \square = 10</math>.</p> <ul style="list-style-type: none"> <li>• What is the missing number?</li> <li>• Imagine ten people on the bus. Seven are sitting on the lower deck. How many are on the top deck?</li> <li>• How can we work out what the missing number is? Can we use counting on?</li> </ul> <p>Put seven counters on the OHT of the bus. Demonstrate how to count on from 7 to 10 by saying '7' to start, and then holding up one more finger at a time, saying '8, 9, 10'.</p> <ul style="list-style-type: none"> <li>• How many fingers am I holding up? So what is the missing number?</li> </ul> <p>Put three more counters on the bus and count on from 7 to check that there are 10.</p> <p>Repeat for <math>\square + 8 = 10</math> and <math>2 + \square = 10</math>.</p>
2	<p><b>Ordering numbers</b></p> <p><b>Objective:</b> Compare and order numbers, using the related vocabulary; use the equals (=) sign</p> <p>Seat children in a circle. Use a set of large number cards from 1 to 30. Give out consecutive cards from 30 downwards so that each child has a different card. Discard any that are left. Starting with the smallest number and continuing round the circle to 30, ask the class to read the numbers aloud.</p> <p>Shuffle the cards by saying two numbers and asking children holding those numbers to stand up and change places. Repeat until the cards are in random order. Now go round the circle asking each child, in turn, to hold up the number on their card. The class then reads the number aloud.</p> <p>Now starting again with the smallest number among the shuffled cards, and continuing in order to 30, ask each child to read their number aloud (with help if necessary) and to stand up as they do so.</p> <p>If time allows, collect and redistribute the cards and repeat the above.</p> <p>Seat children in pairs in a circle. Place the whole set of 1 to 30 cards in random order where all children can see them. Invite one pair of children at a time to select a card, show it to the class and read the number. Remove any cards that are left.</p> <p>The pair of children is to peg the card in the right place on an empty washing line. Help the pair by asking the class:</p> <ul style="list-style-type: none"> <li>• Where should we put this number? Does it go near the beginning or the end? Is it next to any of the numbers already on the line?</li> </ul> <p>Encourage explanations such as:</p> <p>'The number 19 goes next to the 20.'</p> <p>'The number 13 is one more than 12 so it goes after 12.'</p> <p>'The number 17 goes between 15 and 20 because it is more than 15 and less than 20.'</p> <p>'The number 23 is more than the 16 but there are numbers in between that we must leave space for.'</p> <p>Complete the activity by discussing which numbers are missing from the line.</p> <p>Ask children to work in pairs. Give each pair a set of 1 to 4 digit cards and a whiteboard. Ask children to put the cards face up. They should choose two of the cards to make a two - digit number, say the number to each other and write the number on their whiteboards. They return the two cards, and repeat the activity. The aim is to make and record as many</p>

	<p>different two-digit numbers as they can.</p> <hr/> <p><b>Review</b></p> <p>Make sure that all children can see a 1 to 100 number line. Take feedback on the two -digit numbers that children have made, referring to the number line. Ask:</p> <ul style="list-style-type: none"> <li>• Who has made a number between 10 and 20? (12, 13, 14)</li> <li>• Who has made a number between 20 and 30? (21, 23, 24)</li> <li>• Who has made a number between 30 and 40? (31, 32, 34)</li> <li>• Who has made a number between 40 and 50? (41, 42, 43)</li> </ul> <p>Record the numbers made on a flipchart or whiteboard. When all the numbers are collected, point to them in random order, asking the class to read the number aloud.</p>
3	<p><b>Estimating a number of objects</b></p> <p><b>Objective:</b> Count reliably at least 20 objects, recognising that when rearranged the number of objects stays the same; estimate a number of objects that can be checked by counting</p> <p>Organise a random arrangement of up to 10 objects on an interactive whiteboard. Tell children that they are going to practise estimating how many objects there are on the screen and then count to check.</p> <ul style="list-style-type: none"> <li>• Without counting them, how many objects do you think there are?</li> </ul> <p>Take feedback. With children, count the objects on the screen. Touch each object as you count it but don't move it. Jump at random from one object to another so that it is difficult to keep track of the count.</p> <ul style="list-style-type: none"> <li>• Would it be easier to count the objects if we moved them as we counted?</li> </ul> <p>Count again, this time moving the objects to one side as you count them so that it is easy to see which ones have been counted. Agree the total number of objects with children.</p> <ul style="list-style-type: none"> <li>• Could we organise the objects in a sensible way before we count them so that we can keep track of our counting?</li> </ul> <p>Agree that moving the objects into a line can make them easier to count. Do this, and count the objects again.</p> <ul style="list-style-type: none"> <li>• Did moving the objects help us?</li> </ul> <p>Agree that it is easier to count objects when you move them first or rearrange them as you go, so that it is clear which objects have been counted.</p> <p>Show children a new set of objects. Let them see the objects for a few seconds, then hide the objects so children can only see a blank screen.</p> <ul style="list-style-type: none"> <li>• Do you think that there are more or fewer objects this time than we saw last time?</li> <li>• How many objects do you think that there are this time?</li> </ul> <p>Take feedback, then count the objects to check. Move the objects as you count them.</p> <p>Repeat for other numbers of objects. Show each set of objects for a brief amount of time. Each time ask children to estimate and compare, deciding whether they think the number of objects was more or less than the previous set.</p> <ul style="list-style-type: none"> <li>• Which numbers are easy to estimate? (small numbers, or objects organised in small groups)</li> </ul> <p>Display 13 objects on the screen. Ask children to give an estimate. Quickly reorganise the objects into two groups of five and three more objects.</p> <ul style="list-style-type: none"> <li>• How many objects can you see?</li> </ul>

	<p>Discuss the arrangement of the objects and children's estimates. Establish that putting the objects in groups of five has made them easier to count.</p> <p>Show children around 27 objects. Ask children to make an estimate. Record some of the estimates. Encourage children to compare their estimates with the number of objects on the screen the previous time so that they are estimating rather than guessing.</p> <ul style="list-style-type: none"> <li>Now that we have more objects, how shall we organise them to help us?</li> </ul> <p>Ask a child to come and organise the objects into rows of five. Before children count the objects, ask if they want to adjust their estimations. With the class count the objects on the screen. Record the number of objects and compare this with children's estimates.</p> <p>Provide small groups of children with pots containing up to 30 small objects. One child is to pick out a handful of objects and drop them on the table. Each child in the group is to look at the objects without touching them and say how many they think there are. Children record these estimates. They then arrange the objects into a line or put them into groups and adjust their estimate. Children then count the objects, record the number of objects and check the answer against their estimates. They put the objects back in the pot and take it in turns to pick out a handful to estimate, organise and count.</p>
	<p><b>Review</b></p> <p>Discuss how the groups estimated the number of objects that were scattered on the table and if they got better at estimating with more practice.</p> <p>Display a screen with 25 objects arranged randomly. Reveal the screen for about 6 seconds. Hide the objects and ask children for an estimate. Record some of these estimates.</p> <p>Display a screen with 25 objects arranged in five groups of five using the pattern of five that appears on dice. Reveal the screen for about 6 seconds. Hide the screen and ask children for an estimate. Record some of these estimates.</p> <p>With children count the number of objects on each of the screens. Compare children's estimates. Ask if the arrangement on the second screen helped and, if so, why it helped.</p>

### Six more lessons consolidating the above and extending to:

a	<b>Using practical and informal written methods to add a one-digit number to a two-digit number, and to add 10 to a multiple of 10</b>
b	<b>Using practical and informal written methods to subtract a one-digit number from a one-digit or two-digit number, and to subtract 10 from a multiple of 10</b>
c	<b>Solve problems involving adding and subtracting in the context of money, for example to 'pay' and 'give change', including adding and subtracting 10p</b>

## Counting, partitioning and calculating

<b>Objectives</b>
<b>End-of-year expectations (key objectives) are highlighted</b>
<ul style="list-style-type: none"> <li>Solve problems involving counting, adding, subtracting, doubling or halving in the context of numbers, measures or money, for example to 'pay' and 'give change'</li> </ul>
<ul style="list-style-type: none"> <li>Describe ways of solving puzzles and problems, explaining choices and decisions orally or using pictures</li> </ul>
<ul style="list-style-type: none"> <li>Compare and order numbers, using the related vocabulary; use the equals (=) sign</li> </ul>
<ul style="list-style-type: none"> <li>Read and write numerals from 0 to 20, then beyond; use knowledge of place value to position these numbers on a number track and number line</li> </ul>
<ul style="list-style-type: none"> <li>Say the number that is 1 more or less than any given number, and 10 more or less for multiples of 10</li> </ul>
<ul style="list-style-type: none"> <li>Relate addition to counting on; recognise that addition can be done in any order; use practical and informal written methods to support the addition of a one-digit number or a multiple of 10 to a one-digit or two-digit number</li> </ul>
<ul style="list-style-type: none"> <li>Understand subtraction as 'take away' and find a 'difference' by counting up; use practical and informal written methods to support the subtraction of a one-digit number from a one-digit or two-digit number and a multiple of 10 from a two-digit number</li> </ul>
<ul style="list-style-type: none"> <li>Use the vocabulary related to addition and subtraction and symbols to describe and record addition and subtraction number sentences</li> </ul>

## Starters

1	<p><b>Counting in threes</b> <span style="float: right;"><i>Refine</i></span></p> <p><b>Objective:</b> Relate addition to counting on; use practical methods to support the addition of a one-digit number to a one-digit or two-digit number</p> <p>Count in threes with the class to 30 by whispering 'one, two' and saying out loud 'three', and so on.</p> <ul style="list-style-type: none"> <li>Who can tell me a number that we said in a loud voice?</li> <li>If we count in threes, what number will I say after 6? After 15? How did you work it out?</li> </ul> <p>Repeat whispering 'one, two' and saying 'three' out loud, and so on, this time accompanying each multiple of three with a clap.</p> <ul style="list-style-type: none"> <li>What is 3 more than 9? What is 3 more than 27?</li> </ul> <p>Repeat once more. Ask children to count 'one, two' silently to themselves and 'three' out loud, then 'four, five' silently to themselves and 'six' out loud, and so on. This time, accompany the count with regular claps, so that on every third clap the children say the multiples of 3: clap, clap, 'three', clap, clap, 'six', clap, clap, 'nine', and so on.</p>
2	<p><b>Shopping problems</b> <span style="float: right;"><i>Reason</i></span></p> <p><b>Objective:</b> Solve problems involving counting, adding, subtracting, doubling or halving in the context of numbers, measures or money, for example to 'pay' and 'give change'</p> <p>Give out copies of the 'fruit shop' on Resource 1A3.2. Tell children that they are going to buy three things from the fruit shop. Let them choose.</p> <ul style="list-style-type: none"> <li>How are you going to find the total cost?</li> </ul> <p>Agree that they need to add the three prices together. Work through an example. Some</p>

	<p>children may wish to use coins and some may wish to use a number line. Demonstrate how they could use coins to make the three amounts and then find the total. Then show how they could use jumps on a number line starting with the largest number first.</p> <p>Ask children to work in pairs to find the total and record the calculation on their whiteboards.</p> <p>Repeat using three other items.</p> <ul style="list-style-type: none"> <li>I want to buy three satsumas. How much will they cost altogether?</li> </ul> <p>Ask the children to work out the cost.</p> <ul style="list-style-type: none"> <li>How did you work it out?</li> <li>Was there an easy way?</li> </ul> <p>Agree that 5p + 5p is a double and then you can count on 5 more. Some children may use counting in 5s, i.e. 5p, 10p, 15p. Encourage children to use each method.</p>
3	<p><b>Finding the sum of two single-digit numbers</b> <span style="float: right;"><i>Refresh</i></span></p> <p><b>Objective:</b> Use the vocabulary related to addition and subtraction and symbols to describe and record addition and subtraction number sentences</p> <p>Have available a large number line numbered from 0 to 20 and individual number lines for children who may need the support.</p> <p>Use two large white paper plates. Write four different one-digit numbers on the plates, one on the front and one on the back of each plate, e.g. 2, 4, 6 and 7. For each of the questions below, hold up and show the class two of the numbers, changing the numbers for each question.</p> <p>Ask children to respond as far as possible by counting in their heads and writing the answer only on their whiteboards, using their individual number lines only if necessary. After each question, ask one or two children to explain how they worked out the answer. Model the explanation using the 0 to 20 number line. Invite a child to record the number sentence on the board.</p> <ul style="list-style-type: none"> <li>How many altogether is ... and ...?</li> <li>What is ... take away ...?</li> <li>What is the sum of ... and ...?</li> <li>Subtract ... from ... What do you get?</li> <li>What is ... more than ...?</li> <li>How many more/less than ... is ...?</li> <li>Add ... to ... What is the total?</li> <li>What is the difference between ... and ...?</li> <li>What is ... less than ...?</li> <li>What is ... plus/minus ...?</li> <li>When I take ... from a number, I get ... What is the number?</li> <li>When I add ... to a number, I get ... What is the number?</li> </ul>

## Main activities

1	<p><b>Buying 3p stamps</b></p> <p><b>Objective:</b> Solve problems involving counting, adding, subtracting, doubling or halving in the context of numbers, measures or money, for example to 'pay' and 'give change'</p> <p><b>Objective:</b> Describe ways of solving puzzles and problems, explaining choices and decisions orally or using pictures</p>
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Give out copies of Resource 1A3.1. Explain that you bought ten 3p stamps at the Post Office.

- How much did I spend on the stamps?

Count in threes, touching each stamp to keep count.

Show the children an envelope and explain that it will cost 12p to post it.

- How many 3p stamps do I need to stick on my letter?

Encourage children to count in threes until they reach 12. Demonstrate on a number line by holding up a finger on each count: 3, 6, 9, 12. Count the four fingers and agree that they represent the four stamps.

Show a postcard to the children and say that this will cost 6p to send.

- How many stamps do I need to stick on my postcard?

Model holding up a finger for each count: 3, 6; saying: 'I need two stamps.'

Put ten stamps in a box; ask for a volunteer to take out some stamps.

- Ali has five stamps. How much would these stamps cost him?
- How can we find out?

Establish the amount by counting the stamps, saying: '3p, 6p, 9p, 12p, 15p'.

- If I took four stamps from the box, how much would they cost me?

Establish the amount by counting the stamps, saying: '3p, 6p, 9p, 12p'.

Ask the children to work in pairs to find all the amounts of money it is possible to spend by buying up to six stamps.

- What is the smallest amount you could spend?
- How can you make sure that you find all the possible answers?

Agree that it will be useful to start by counting one stamp, then two, then three, and so on. Demonstrate using pictures to record, sketching a rectangle for each stamp and writing the total at the side.

## Review

Take feedback on children's answers, writing them in a table on the board.

Number of stamps	Cost
1	3p
2	6p
3	9p
4	12p
5	15p
6	18p

- What is the largest amount I could spend?
- How much would four stamps cost me?
- If my letter is going to cost 18p to post, how many stamps do I need to buy?

Show the children a purse and explain that it has six 2p coins in it.

- How much money is in my purse?

Count the coins to establish that there is 12p.

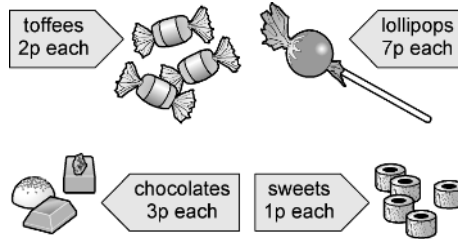
- What other amounts could I make from the coins in my purse?
- How will I know if I have all the possible totals?
- Can we draw a table to help us?

## Shopping problems

**Objective:** Solve problems involving counting, adding, subtracting, doubling or halving in the context of numbers, measures or money, for example to 'pay' and 'give change'

**Objective:** Describe ways of solving puzzles and problems, explaining choices and decisions orally or using pictures

Prepare an interactive whiteboard display of a 'shop' with four items and their prices (e.g. sweets 1p each, toffees 2p each, chocolates 3p each and lollipops 7p each).



Ask children to work in pairs and to discuss answers to your questions before writing the answers on their whiteboards. Encourage them to work out their answers by counting in their heads or by using their fingers. Have available on each table some coins and number lines for children to use as support if necessary.

- What is the cost of 3 toffees?
- Which costs more: a lollipop or 2 chocolates?
- What is the cost of 2 sweets and a lollipop? 2 toffees, 1 chocolate and 1 sweet?
- How much more is a lollipop than a toffee?
- How much change from 5p do you get for a chocolate?
- How many toffees can you buy for 10p?
- Jenny has saved 2p towards a lollipop. How much more must she save?
- Which two coins will buy you a lollipop?
- Which two coins will buy you a lollipop and a chocolate?

After each question ask one or two children to explain how they knew the answer or how they worked it out. Model their explanation using large cardboard coins or coins on the interactive whiteboard.

Make sure that children have copies of Resource 1A 3.2. Ask them to buy three things from the 'fruit shop' and to record the number sentences in their books. They can use coins or number lines or work out the answers. They should then choose three other things, and so on.

### Review

- I spent 8p in the fruit shop. What could I have bought?

Ask the children to work in pairs to find out.

- Could I buy more than one piece of fruit?
- What could I not buy?

Repeat with 17p. Tell children that you bought two of one type of fruit and one other fruit.

### Number sequences

**Objective:** Solve problems involving counting, adding, subtracting, doubling or halving in the context of numbers, measures or money, for example to 'pay' and 'give change'

**Objective:** Describe ways of solving puzzles and problems, explaining choices and decisions orally or using pictures

Have number lines available to support children with identifying and writing the numbers they require.

Write on the board: 2, 4, 6, 8, ... Tell children that this is a sequence of numbers and that it has a pattern. Ask them to talk to their partners about the sequence.

- What do you notice?
- Are all the counting numbers there? Which ones are missing?
- Can anyone describe this sequence of numbers?
- What do you need to know in order to continue the sequence?
- What is the difference between the neighbouring numbers in the sequence?

Look together at the pattern of the numbers on the number line, and the hops from one number to the next. Ask children either to write or to find the correct number cards for the next three numbers in the sequence.

- Would 18 be in this sequence? How do you know?

Explain that the numbers in the sequence are called even numbers.

Write on the board the sequence: 1, 3, 5, 7, ...

- Can anyone describe this sequence of numbers? What is the rule?
- What would the next three numbers be?

Ask children to write the next three numbers on their whiteboards.

- Would 19 be in this sequence? How do you know?

Explain that the numbers in the sequence are called odd numbers.

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Write on the board the sequence: 2, 5, 8, 11, ... Ask children to talk to their partners about this sequence of numbers.

- What do you notice?
- Which numbers are missing?
- How can you use a number line to help you spot the pattern?

Encourage children to find the difference between the numbers in the sequence by counting on from the previous number to the next.

- Can anyone describe this sequence of numbers? What is the rule?
- What would the next three numbers be?

Ask children either to write or to find the correct number cards for the next three numbers.

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Ask children to work in pairs to create their own number sequence. Encourage them to use number lines to help them identify the numbers. They make a stack of the cards in their sequence and pass the stack to another pair. Each pair then puts the cards in order and agrees the rule for the sequence. They record this rule using numbers and words.

The two pairs then come together to check that their ordering and rules are correct.

### Review

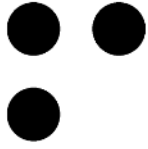
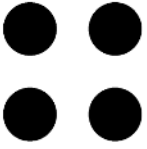
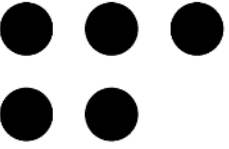
Bring the whole class together.

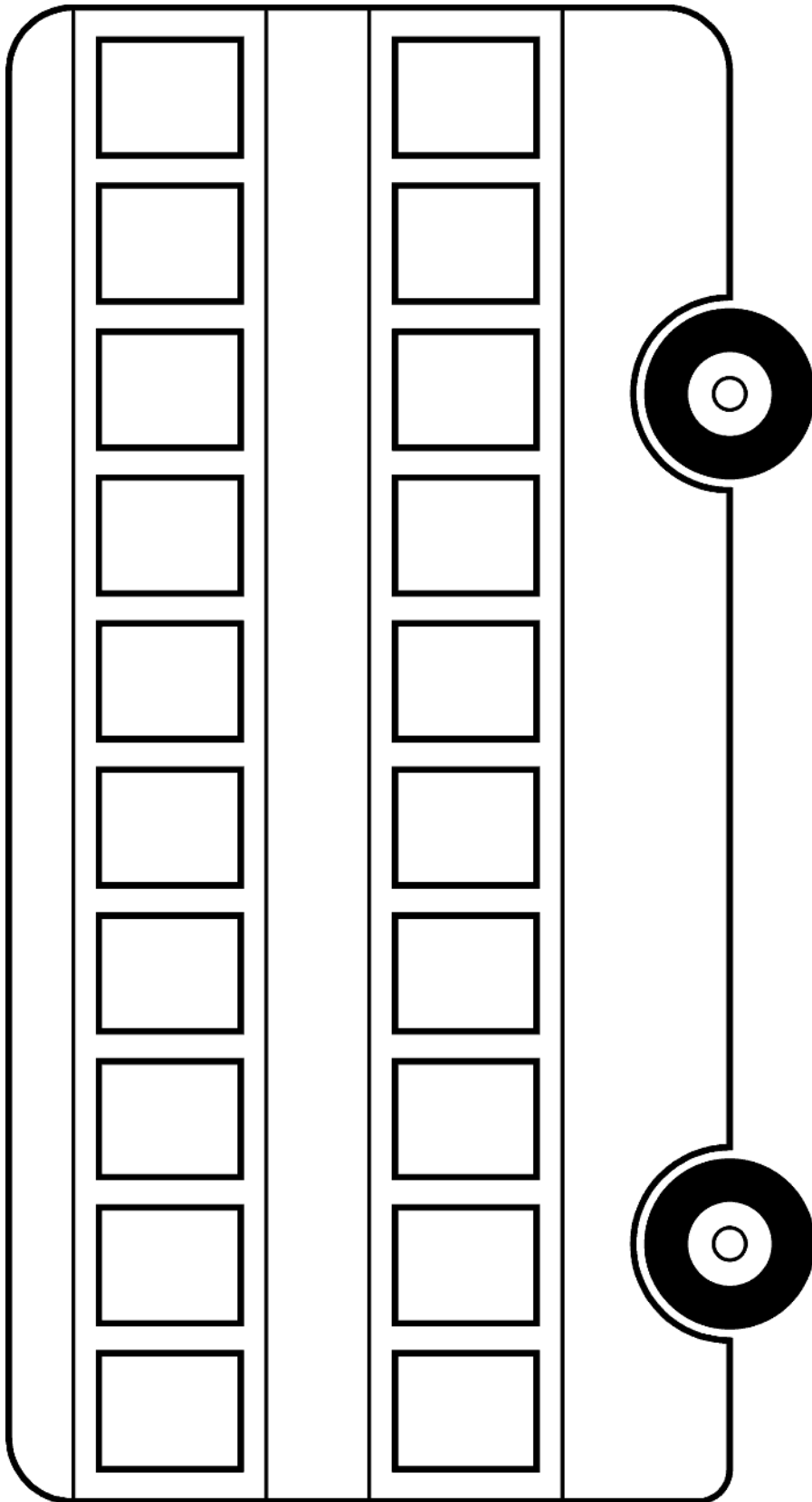


	<ul style="list-style-type: none"> <li>• What do you need to know in order to decide the rule for a sequence?</li> <li>• Did anyone make a sequence that had only even numbers?</li> <li>• Did anyone make a sequence that had only odd numbers?</li> </ul> <p>Write on the board: 14, 12, 10, 8, ...</p> <p>Ask children to talk to their partners about what is happening in this sequence.</p> <ul style="list-style-type: none"> <li>• How is this sequence different from the ones we were looking at earlier?</li> <li>• What is the same about it?</li> </ul> <p>Ask children to suggest some other sequences that go backwards.</p>
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### **Six more lessons consolidating the above and extending to:**

a	<b>Reading and writing numerals beyond 20; partitioning and ordering two -digit numbers; saying the number that is 1 or 10 more or less than any two -digit number</b>
b	<b>Using practical and informal written methods to add or subtract a one -digit number to or from a two-digit number (e.g. <math>38 + 5</math>, <math>52 - 7</math>)</b>
c	<b>Using practical and informal written methods to add or subtract a multiple of 10 to or from a two-digit number (e.g. <math>43 + 30</math>, <math>92 - 50</math>)</b>

<p>1 less</p>  <p>3</p>	 <p>4</p>	<p>1 more</p>  <p>5</p>
<p>1 less</p>		<p>1 more</p>
<p>1 less</p>		<p>1 more</p>
<p>1 less</p>		<p>1 more</p>
<p>1 less</p>		<p>1 more</p>
<p>1 less</p>		<p>1 more</p>

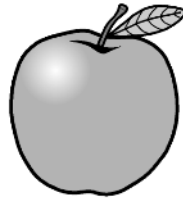




## Fruit shop



Orange 7p



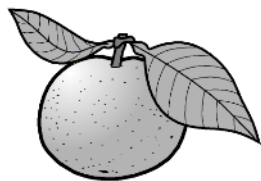
Red apple 4p



Banana 8p



Pear 10p



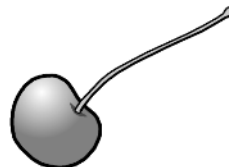
Satsuma 5p



Kiwi 3p



Green apple 6p



Cherry 2p