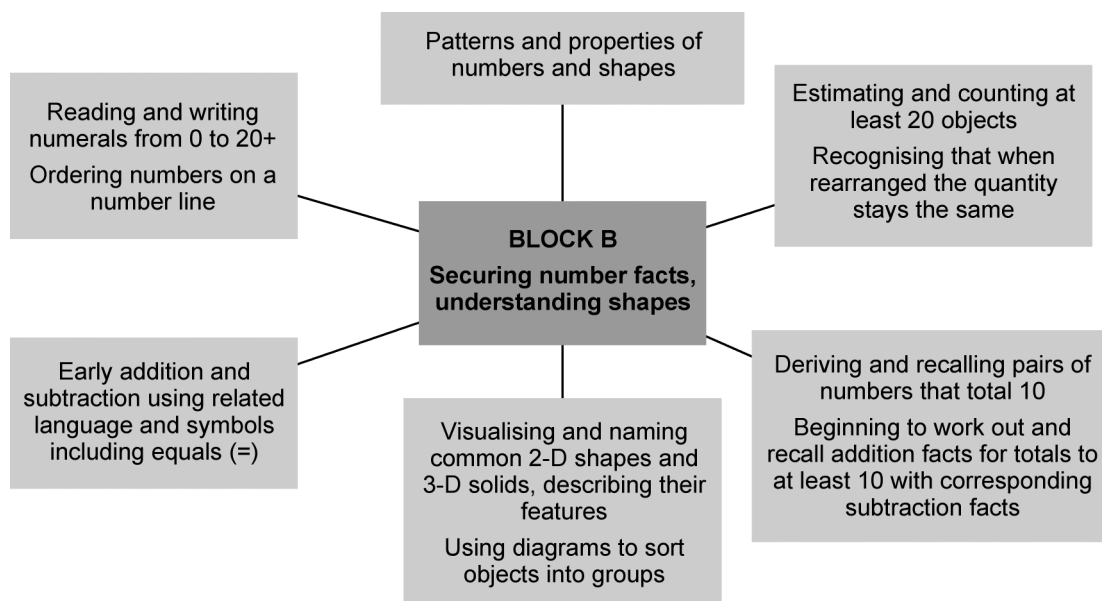


Securing number facts, understanding shapes



Objectives	Units		
	1	2	3
End-of-year expectations (key objectives) are highlighted			
• Describe simple patterns and relationships involving numbers or shapes; decide whether examples satisfy given conditions	✓	✓	✓
• Solve problems involving counting, adding, subtracting, doubling or halving in the context of numbers, measures or money, for example to 'pay' and 'give change'	✓	✓	✓
• 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	✓		
• 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	✓		
• Say the number that is 1 more or less than any given number, and 10 more or less for multiples of 10	✓	✓	
• Derive and recall all pairs of numbers with a total of 10 and addition facts for totals to at least 5; work out the corresponding subtraction facts	✓	✓	✓
• Recall the doubles of all numbers to at least 10		✓	✓
• 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			✓
• 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			✓
• Use the vocabulary related to addition and subtraction and symbols to describe and record addition and subtraction number sentences			✓

Objectives	Units		
	1	2	3
End-of-year expectations (key objectives) are highlighted			
• Visualise and name common 2-D shapes and 3-D solids and describe their features; use them to make patterns, pictures and models	✓	✓	✓
• Use diagrams to sort objects into groups according to a given criterion; suggest a different criterion for grouping the same objects			✓

Speaking and listening objectives for the block

Objectives	Units		
	1	2	3
• Listen with sustained concentration	✓		
• Take turns to speak, listen to others' suggestions and talk about what they are going to do		✓	
• Ask and answer questions, make relevant contributions, offer suggestions and take turns			✓

Opportunities to apply mathematics in science

Activities		Units		
		1	2	3
1a	Ourselves: Count the children in each group.	✓		
1b	Growing plants: Count the number of leaves on a plant as it grows.		✓	
1c	Sorting and using materials: Sort a collection of shapes in different colours, sizes and materials. Count how many are in each set.			✓

Key aspects of learning: focus for the block

Enquiry	Problem solving	Reasoning	Creative thinking
Information processing	Evaluation	Self-awareness	Managing feeling
Social skills	Communication	Motivation	Empathy

Vocabulary

problem, answer, method, number sentence, sign, operation, explain, read, write, record, count, compare, order, estimate, predict, pattern, repeating pattern, sort, property, set, group

zero, one, two, three, ..., hundred; first, second, third, ...; ones, tens, 'teens' number, exchange, digit

count to, count on/back to/from, count up to/from, the same number as, as many as, equal to, equals (=), sign, more, less, before, after, halfway, nearly, roughly, add, plus (+), makes, sum, total, altogether, subtract, minus (−), take away, leaves, difference, double, halve, half

how many ...?, how many more to make ...?, how many more is ... than ...?, how much more is ...?, how many fewer is ... than ...?, how much less is ...?, what is the difference between ...?

shape, make, build, draw, curved, straight, hollow, solid, flat, side, corner, point, face, edge, cube, cuboid, pyramid, cone, cylinder, sphere, triangle, circle, rectangle, square

Building on previous learning

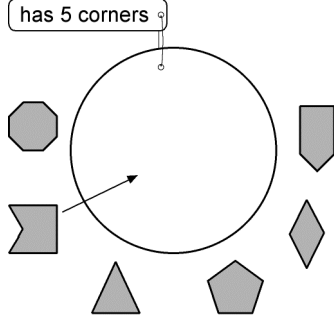
Check that children can already:

- make and talk about simple patterns using numbers and shapes
- say and use the number names in order in familiar contexts and recognise numerals 1 to 9
- count reliably up to 10 objects
- use language such as 'more' or 'less' to compare two numbers
- find one more or one less than a number from 1 to 10, using resources
- select two groups of objects to make a given total
- use language such as 'circle' or 'bigger' to describe the shape and size of solids and flat shapes
- sort objects into groups and explain how they sorted them

Unit 1B1

3 weeks

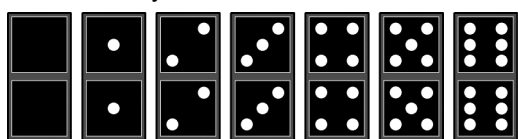
Objectives <i>Children's learning outcomes in italic</i>	Assessment for learning
<ul style="list-style-type: none"> Describe simple patterns and relationships involving numbers or shapes; decide whether examples satisfy given conditions <i>I can use numbers or shapes to copy and continue a simple pattern</i> 	<p>Can you see a pattern in the number of objects? Is there a pattern in the shapes? How do you know what comes next?</p> <p>Can you talk about the pattern in your own words?</p>
<ul style="list-style-type: none"> Solve problems involving counting, adding, subtracting, doubling or halving in the context of numbers, measures or money, for example to 'pay' and 'give change' <i>I can begin to solve a problem or puzzle by deciding what the important information is</i> 	<p>How are you going to tackle this?</p> <p>What is the important information that you have?</p> <p>What approach are you going to use? Why?</p>
<ul style="list-style-type: none"> 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 <i>I can count at least 20 objects and know that the last number I say is how many there are altogether</i> 	<p>Spread out these ten counters that you put in a line. How many counters are there? How do you know?</p> <p>Can you count the cubes (up to five) I have tipped out of the pot without touching them?</p> <p>Make an estimate of the number of cubes in the jar. Is it near 10 or 20?</p>
<ul style="list-style-type: none"> 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 <i>I can read, write and order numbers up to 20</i> 	<p>What is the number before/after 10?</p> <p>What is the number before 20?</p> <p>What numbers are between 15 and 20?</p> <p>What number on the track is hidden?</p>
<ul style="list-style-type: none"> Say the number that is 1 more or less than any given number, and 10 more or less for multiples of 10 <i>I can use counters or the number line/100-square to find the number that is one more or one less than a number</i> <i>I can find the number that is ten more or ten less for a particular tens number</i> 	<p>There are four counters in the pot. How many will there be if I put in one more?</p> <p>There are six spots on my dice. Imagine there is one less spot. How many spots would there be?</p> <p>I am thinking of 30. What is ten more/less than 30? How could a number line or 100-square help you?</p>
<ul style="list-style-type: none"> Derive and recall all pairs of numbers with a total of 10 and addition facts for totals to at least 5; work out the corresponding subtraction facts <i>I know some pairs of numbers that total 10</i> <i>I can use counters or blocks to add numbers with answers up to 5</i> 	<p>If you know that $7 + 3 = 10$ what else do you know?</p> <p>What numbers could you add to give a total of 4? Are there other ways to get a total of 4?</p>

Objectives <i>Children's learning outcomes in italic</i>	Assessment for learning
<ul style="list-style-type: none"> Visualise and name common 2-D shapes and 3-D solids and describe their features; use them to make patterns, pictures and models <p><i>I can use 2-D and 3-D shapes to make patterns, pictures and models</i></p> <p><i>I can name most of the 2-D and 3-D shapes I use in my work as well as those I see in my classroom and playground</i></p> <p><i>I am beginning to picture a shape in my head</i></p>	<p>Picture a rectangle in your head. Can you tell me about it so that I can picture it?</p> <p>When you imagine a square, how many edges does it have? How is it like this square? Is it different in any way?</p> <p>Draw arrows to show which shapes belong in the set.</p> <p>has 5 corners</p> 
<ul style="list-style-type: none"> Listen with sustained concentration <p><i>I can listen carefully to my teacher, to my partner and to other children</i></p>	<p>Look at the shapes. Listen to this description of one of them. Can you tell which shape is being described?</p>

Learning overview

Children **count** in as many different contexts as possible. They count aloud in ones as whole class, and continue the count after given a sequence such as *four, five, six, ...* They count forwards and backwards. They say number rhymes and sing number songs. They count the number of claps that they hear. They count sets of objects in the classroom: books on the shelf, toys in a toy box, knives and forks, the children in a group. When shown a numeral, they count out that number of small toys or crayons. They recognise a small number of objects without counting them and explain how they know.

Children begin to use patterns and relationships to **solve problems and puzzles** involving numbers and shapes. For example, they continue a simple pattern of dominoes or put the domino doubles in order. They learn to identify problems and re-state them for themselves. They think about the methods they could use to reach a solution.



They **locate numbers on a number track** and begin to **identify that the number before is one less and the next number is one more**. They respond to questions such as:

What number comes after 6? Two after 6?

What number comes before 9? Two before 9?

They use this information to support addition and subtraction calculations. They explore calculation patterns in **pairs of numbers with a total of 10**, using their fingers in support. They continue their counting strategies, which underpin much of their work. They count on and back in steps of 5 to 30, and steps of 10 to 50. They make estimates of a number of objects based on their experience of visual patterns and arrays of objects.

Children **use 2-D shapes and 3-D solids to build models, pictures and patterns**. They learn to **name shapes and describe their features**. In describing the features they refine their everyday language to include appropriate mathematical terms. The children use flat '2-D shapes' made from

card or thin plastic to support the early development of visualisation and mental imagery of shapes. They take part in activities such as:

I spy something that will roll, ... has a curved face, ... has two holes in it, ... has lots of points, ...

Put your hands into this big box. Can you find something soft? An object with corners?


Something round? Something spiky?

Look at this collection of objects or shapes. Shut your eyes while I pick one up and hide it. Open your eyes. Tell me which object or shape I have hidden.

Children **listen carefully** to instructions, descriptions and explanations and pick out the key points. For example, they listen carefully to a description of a shape so that they can select the shape that matches the description from a collection. They **talk about patterns** they have made, describe the way they have solved a problem and respond to questions about what they have done, which helps them to clarify their mathematical thinking and understanding.

Unit 1B2

3 weeks

Objectives <i>Children's learning outcomes in italic</i>	Assessment for learning
<ul style="list-style-type: none"> Describe simple patterns and relationships involving numbers or shapes; decide whether examples satisfy given conditions <i>I can use numbers or shapes to make patterns of my own</i> <i>I can describe my patterns to others</i> 	<p>Describe the pattern so that your partner can make it. Tell me how to continue the pattern. Make a string of beads for me. First a red one, then a blue one. Carry on threading one red, one blue. What colour is the sixth bead on your string? What colour will the tenth bead be? The twentieth bead? How do you know?</p>
<ul style="list-style-type: none"> Solve problems involving counting, adding, subtracting, doubling or halving in the context of numbers, measures or money, for example to 'pay' and 'give change' <i>I can use what it says in a problem to work out what sum to do</i> 	<p>Tell me about how you solved this problem? Why did you choose that calculation?</p>
<ul style="list-style-type: none"> Say the number that is 1 more or less than any given number, and 10 more or less for multiples of 10 <i>I can say the number that is one more or one less than a number</i> <i>I can say the number that is ten more or ten less than a multiple of ten</i> 	<p>What is one more than 18? What is one less than 15? Can you ask me a one more/less question? How will you know if my answer is right? I will clap where a number is missing. What is the missing number? 12 22 32 42 [one clap] 62</p>
<ul style="list-style-type: none"> Derive and recall all pairs of numbers with a total of 10 and addition facts for totals to at least 5; work out the corresponding subtraction facts <i>I know the pairs of numbers that total 10</i> <i>I know how to add numbers to make different totals up to 5 and I am beginning to work out take away answers as well</i> 	<p>Use the number cards 1 to 9. Which pairs of numbers total 10? What number would you add to 5 to make 10? There are five beans on the plate. I hide some under (an upturned) beaker. I write this to show what I have done: $5 - 3 = 2$ Use the five beans and hide a different number. Can you write a subtraction sentence to show what you have done?</p>
<ul style="list-style-type: none"> Recall the doubles of all numbers to at least 10 <i>I can recall or work out the doubles of numbers up to $5 + 5$ or more</i> 	<p>I roll double 3. What is my score? Pick a number and double it. What is the largest number you can double? Show how you know that your answer is right.</p>
<ul style="list-style-type: none"> Visualise and name common 2-D shapes and 3-D solids and describe their features; use them to make patterns, pictures and models <i>I know the names of familiar 2-D and 3-D shapes and I can picture these shapes in my head</i> 	<p>Picture a triangle in your head. Start at the top and walk around the sides of the triangle. How many sides do you walk around? How many corners does the triangle have? Here are five rectangles of the same size. How many different bigger rectangles can you make using two or more of the rectangles?</p> 
<ul style="list-style-type: none"> Take turns to speak, listen to others' suggestions and talk about what they are going to do <i>I know how to take turns to make sure everyone can speak and listen</i> <i>I listen carefully to my partner or the group and respond with helpful suggestions</i> 	<p>How will you make sure that everyone has a chance to explain their ideas?</p>

Learning overview

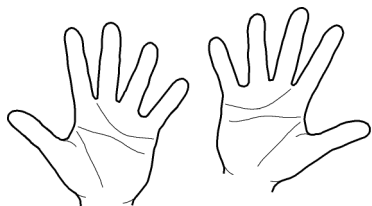
Children continue to **count** in as many different contexts as possible. They count as far as they can towards one hundred. They count and record the number of children present each day. They count in a soft voice to ten, a loud voice to twenty, a soft voice to thirty, and a loud voice to forty, and so on. They continue the count after given a sequence such as *twenty-four, twenty-five, twenty-six, ...* They count forwards and backwards in ones and in tens. They begin to count in twos, at first to ten and then to twenty. When shown a numeral such as 16, they count out that number of small cubes and show that they have ten and six cubes. They count on from one number to another, for example, from 25 to 30, counting *twenty-six, twenty-seven, twenty-eight, twenty-nine, thirty*, recording on their fingers that they have counted on five numbers. They count sounds such as chimes on a xylophone or beats on a drum, including groups of two beats. They continue to recognise a small number of objects without counting them and explain how they know. They estimate how many there are in a larger number of objects such as shells and check by counting.

Children use patterns and relationships to **solve problems and puzzles**. For example, they make simple patterns with numbers or shapes and refer to the resources to help them to describe the pattern. They explain how to continue the pattern using appropriate mathematical words. They use their developing calculation and problem-solving skills to identify whether a problem involves addition or subtraction, for example:

There are six pegs on the coat hanger. I clip on two more. How many pegs on the hanger now?

There are eight pegs on the coat hanger. Five are showing. How many are hidden under the cloth?

Children derive and learn to recall **pairs of numbers with a total of 10**. They derive and then recall addition facts for totals up to at least 5 and the related subtraction facts. They extend their **recall of doubles of numbers up to at least 5 + 5**.



Children continue to identify the number that is one or ten more or less than a given number, extending to a wider range of numbers and contexts, including the 100-square. They use this to support their calculating skills for examples such as $12 + 1$, $13 - 1$, $30 + 10$ and $60 - 10$. Children continue to develop their understanding of how to represent number stories with **number sentences**. This supports their use of appropriate mathematical vocabulary and symbols.

Children **build models, pictures and patterns with 2-D shapes and 3-D solids**. The experience helps them to **name shapes and describe their features**. They refine their everyday language to include appropriate mathematical terms. Children continue to develop mental images of these shapes by participating in activities such as:

Tell me where in the classroom you can see a circle, a square, a triangle, ... What about a cube?

Can you see a cone anywhere?

I've hidden an object/shape/wooden numeral in this cloth bag. Pass it round and tell me what you think it is. How do you know?

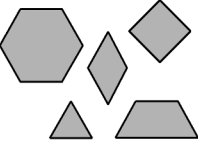

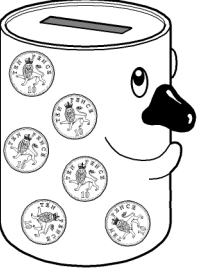
Imagine a big triangle painted on the floor. How many corners does it have? How many sides?


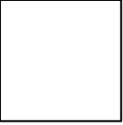








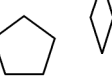








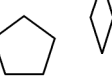








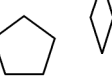

Imagine holding a tin of beans, and turning it round and round in your hands. How many circles can you see?

Shut your eyes. Listen while I describe a shape to you ... Now open your eyes. Can you pick up the shape I was describing? Now describe a shape for someone else to guess.

Children **sort numbers and shapes** into groups and develop their information-processing skills. For example, they separate squares from rectangles and cubes from cuboids. They sort number cards to identify all the numbers that are even or all the numbers that they say when they count in fives. They identify capital letters made from only straight lines, distinguishing them from those with at least one curved line.

Children **listen carefully** to instructions, descriptions and explanations to pick out the key points such as the features of the shape that is being described. They **take turns to speak**, listen to others' suggestions and talk about what they are going to do. They develop their ability to work with others and become more familiar with taking an active part in paired or small-group work.

Objectives <i>Children's learning outcomes in italic</i>	Assessment for learning
<ul style="list-style-type: none"> Describe simple patterns and relationships involving numbers or shapes; decide whether examples satisfy given conditions <i>I can use numbers or shapes to make patterns of my own and explain what comes next</i> 	<p>Can you make a different pattern using the same numbers/shapes? What comes next? How did you work that out? Look at these shapes.</p>  <p>Which two of the shapes would fit together to make the shape below? Tick the two shapes.</p> 
<ul style="list-style-type: none"> Solve problems involving counting, adding, subtracting, doubling or halving in the context of numbers, measures or money, for example to 'pay' and 'give change' <i>I can talk about how I solved a problem or puzzle</i> 	<p>How did you do the calculations? What if you used different numbers or coins, would that change your way of working? How much money is in the money box?</p> 
<ul style="list-style-type: none"> Derive and recall all pairs of numbers with a total of 10 and addition facts for totals to at least 5; work out the corresponding subtraction facts <i>I know the pairs of numbers that total 10</i> <i>I can remember or work out simple add and take away calculations with answers to 5</i> 	<p>How many different pairs of numbers can you remember that have a total of 10? How can you be sure you have got them all? Look at this addition: $2 + 3 = 5$ Can you make a subtraction sentence using those numbers?</p>
<ul style="list-style-type: none"> Recall the doubles of all numbers to at least 10 <i>I can recall doubles of numbers up to $10 + 10$</i> 	<p>If you choose a number between 1 and 10 and double it, what is your answer? Can you double other numbers? Try these: 10 20 30 40 50 I doubled a number and got 18. What number did I double?</p>
<ul style="list-style-type: none"> 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 <i>I can add using counting on</i> <i>I know that if I add my numbers in any order I will get the same answer</i> 	<p>There are 15 cubes in the bag. Can you count on as I put in 3 more? What is 15 count on 3? What is 12 and 3 more? What can you tell me about $6 + 4$ and $4 + 6$? I want to find the total of these numbers: 2, 14 and 8. Tell me some different ways I could add them. Would they all give the same answer? How do you know? I am thinking of a number. It is 20 more than 50. What number am I thinking of?</p>

Objectives <i>Children's learning outcomes in italic</i>	Assessment for learning												
<ul style="list-style-type: none"> 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 <p><i>I can subtract by taking away and by counting up to find the difference between the numbers</i></p>	<p>What is 8 take away 4?</p> <p>Show me two numbers that have a difference of 3. Can you think of another pair of numbers with a difference of 3?</p> <p>How many do I add on to get from 3 to 8?</p> <p>15 ducks are on the pond. 11 of them go away. How many are left?</p>  <p>How many more ducks must come to the pond to make 19 ducks altogether?</p>												
<ul style="list-style-type: none"> Use the vocabulary related to addition and subtraction and symbols to describe and record addition and subtraction number sentences <p><i>I can use mathematical words and symbols to describe and record add and take away calculations</i></p>	<p>There are 12 pegs on a coat hanger. Five are showing. How many are hidden under the cloth?</p> <p>What number sentence could we write to show this?</p> <p>Put numbers in the shapes that add to 12.</p> <p>$\bigcirc + \triangle = 12$</p>												
<ul style="list-style-type: none"> Visualise and name common 2-D shapes and 3-D solids and describe their features; use them to make patterns, pictures and models <p><i>I can describe and match a shape using mathematical features such as sides, corners, faces</i></p> <p><i>I can work with a partner to picture a shape in my mind</i></p>	<p>Think of a shape. Without saying its name, can you describe it so that I can find your shape in the box?</p> <p>Can you describe your shape to your partner so that your partner can picture it?</p> <p>Draw a line on this square to make two triangles. You may use a ruler.</p>  <p>Find two shapes with only five straight sides. Draw a circle around them.</p> 												
<ul style="list-style-type: none"> Use diagrams to sort objects into groups according to a given criterion; suggest a different criterion for grouping the same objects <p><i>I can choose reasons for sorting my objects into groups and use a diagram to record this</i></p> <p><i>I can use the same objects but group them using different reasons</i></p>	<p>How have you sorted the objects? How did you decide that this object belongs here?</p> <p>Could you sort them in a different way?</p> <p>These shapes have been sorted. Put a cross on the shape which is in the wrong place.</p> <table border="1" data-bbox="667 1668 965 2016"> <thead> <tr> <th>triangles</th><th>not triangles</th></tr> </thead> <tbody> <tr> <td></td><td></td></tr> <tr> <td></td><td></td></tr> <tr> <td></td><td></td></tr> <tr> <td></td><td></td></tr> <tr> <td></td><td></td></tr> </tbody> </table>	triangles	not triangles										
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Objectives <i>Children's learning outcomes in italic</i>	Assessment for learning
<ul style="list-style-type: none"> Ask and answer questions, make relevant contributions, offer suggestions and take turns <p><i>When I am working with a partner or a group I know that taking turns is important</i></p> <p><i>I can ask helpful questions as well as answer questions</i></p> <p><i>I can make suggestions to help our work</i></p>	<p>What question could you ask to help you to find out what shape is hidden in the bag?</p>

Learning overview

Children continue to **count on and back** to consolidate their understanding of **addition and subtraction**. They explore the significance of 10 in the number system and the structure of two-digit numbers. They identify missing numbers when they hear a sequence spoken aloud, such as 44, 45, 46, [one clap], 48, 49. They continue counting over the tens boundary when started with a sequence such as 66, 67, 68, ... They respond to questions such as:

What is one less than 80? What is one more than 39?

What is ten less than 60? What is ten more than 45?

Children explore how the number facts that they know can be used to work out other calculations. They know, for example, that $5 - 2$ can be used to work out $15 - 2$, $25 - 2$, $35 - 2$, ... and that $3 + 2 = 5$ helps them to know that $20 + 30 = 50$. They represent the patterns that they make with **number sentences**. This supports their use of appropriate mathematical vocabulary and symbols.

Children consolidate their use of patterns and relationships to **solve number problems and puzzles**. For example, they find out how many birthday candles they have blown out since they were born or how many pairs they can make from 24 socks. They explore different ways of making 12 by adding two or more smaller numbers. They talk about how to approach problems and puzzles and they compare different approaches. They represent their solutions on a number line or 100-square and by using number sentences.

Children use their growing understanding of the **properties of 2-D and 3-D shapes** to identify and visualise a particular shape. They take part in activities such as:

Look at this collection of objects or shapes. Shut your eyes while I pick one up and hide it. Open your eyes. Tell me which object or shape I have hidden.

How many of these bricks do you think will pack into this box? Try it and see.

Imagine a big square painted on the floor. How many corners does it have? How many sides?

Imagine cutting off one of the corners. What shape would be left? Draw it for me on your paper.

Make a simple pattern by printing five or six shapes on one half of some paper. Copy your pattern on the other half. How many shapes are there on one half? On both halves? Which shape matches the shape that I am pointing to on the other half?

Look at this pattern I have made. One piece is missing. Which piece is it?

Children **sort and classify information** and in doing so represent a range of relationships. For example, they identify all the 2-D shapes with a square corner or all the 3-D solids with a rectangular face. They identify all the numbers in a given set that are greater than 45, or all the numbers on a 100-square with a digit 4. They represent the sets that they have made on a Venn or Carroll diagram.

Children describe how they approach their work using appropriate mathematical words. They **ask and answer questions**, make relevant contributions, offer suggestions and take turns to increase

their understanding of the different methods and calculation strategies used to solve a problem. They consider and evaluate other children's suggestions and methods, judging the appropriateness or usefulness of what they do and hear. They develop some simple criteria for judging their own and others' work and ideas. By exchanging ideas and methods, children become aware of another child's point of view and in some cases adjust their original ideas and methods as a result.