

Unit 8
Counting, properties of numbers and reasoning about numbers

Five daily lessons

Primary
National Strategy

Year 1
Summer term

This Unit Plan is designed to guide your teaching. You will need to adapt it to meet the needs of your class.

Unit Objectives

Year 1

- Describe and extend number sequences: **count on and back in ones from any small number, and in tens from and back to zero;** count on in twos from zero, and begin to recognise odd or even numbers to about 20 as every other number; begin to count on in steps of 3 from zero; recognise and extend number sequences with differences of 1, 2 or 3.
- Investigate a general statement about familiar numbers by finding examples that satisfy it.
- Explain methods and reasoning orally.

Pages 2, 4, 6

Page 64

Page 64

Link Objectives

Reception

- Recite the number names in order, continuing the count forwards or backwards from a given number.
- Count in tens.
- Count in twos.
- **Talk about, recognise and recreate simple patterns:** for example simple repeating or symmetrical patterns from different cultures.

Year 2

- **Describe and extend number sequences: count on or back in ones or tens, starting from any two-digit number;** count in hundreds from and back to zero; count on in twos from and back to zero and **recognise odd and even numbers to at least 30;** count on in steps of 3, 4 or 5 to at least 30, from and back to zero, then from and back to any given small number.
- Investigate a general statement about familiar numbers or shapes by finding examples that satisfy it.
- **Explain how a problem was solved** orally, and where appropriate in writing.

Resources needed to teach this unit:

- Resource sheet 8.1
- Resource sheet 8.2
- Resource sheet 8.3
- Whiteboards
- Bag or box
- 0–90 number cards
- Hand puppet
- Large 0–30 number line
- 0–20 number line
- Coathanger
- Pegs
- Cloth
- Sets of 1–9 digit cards
- Large dice
- Purse
- Envelopes and postcards
- Mega money (large coins)
- Flat shapes
- Hundred square
- Bead string

Also see the table of Problem Solving Strategies.

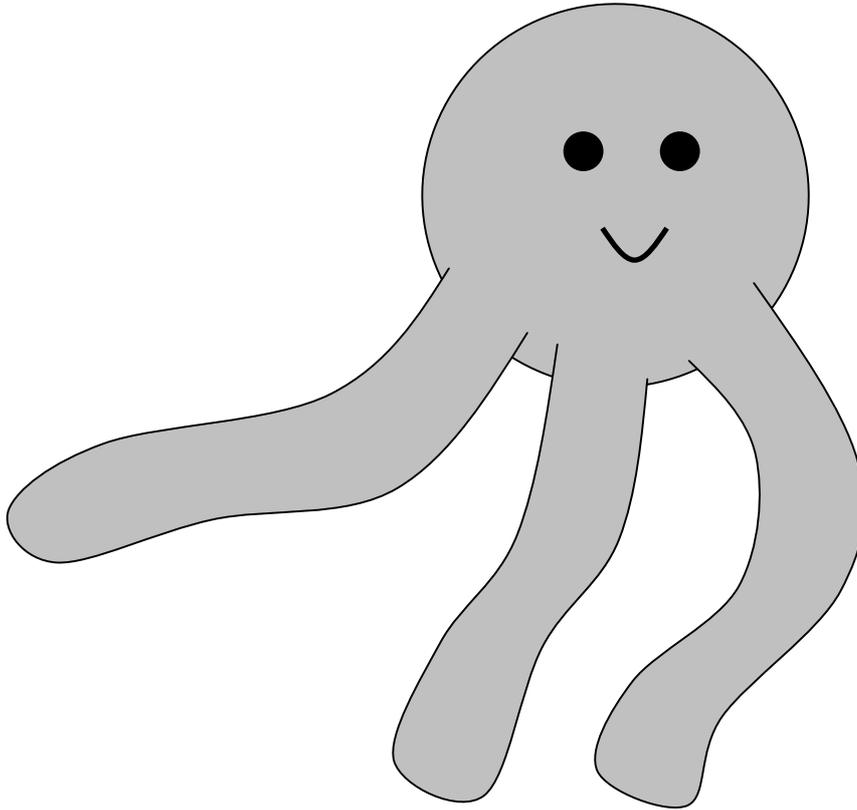
(Key objectives in bold)

Planning sheet	Day One	Unit 8 <i>Counting, properties of numbers and reasoning about numbers</i>	Term: <i>Summer</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 and back in ones from any small number, and in tens from and back to zero.</p> <p>VOCABULARY count on count back ones tens</p> <p>RESOURCES Cards showing multiples of 10 Bag or box Hand puppet</p>	<ul style="list-style-type: none"> Sit the children in a circle, count around the circle in ones starting at 1. Repeat, this time starting at 6. <p>Q Who will say 11?</p> <p>Q What number will Ella say?</p> <p>Count around the circle to check.</p> <ul style="list-style-type: none"> Repeat starting with different children and starting numbers. Use a puppet to practise counting back: Puppet says: 30, 29, 28. Children respond with 27, 26, 25. Repeat. Flash both hands at the children to show different multiples of 10, encouraging children to count in tens to keep track. Ask a child to stand up and select a tens number from a bag. Ask the rest of the class to identify the number selected by counting flashes of hands. 	<p>Begin to count on in steps of 3 from zero.</p> <p>VOCABULARY pattern threes count on</p> <p>RESOURCES Resource sheet 8.1 Large 0–30 number line</p>	<ul style="list-style-type: none"> Use Resource sheet 8.1 to make up ten Tripus (imaginary creatures with three legs). Introduce the Tripus to the class, explain that the word tri means three; can they think of any other words that start with tri? <p>Q How many wheels does a tricycle have?</p> <p>Q How many sides does a triangle have?</p> <p>Q How many legs does a tripod have?</p> <ul style="list-style-type: none"> Stick two of the creatures on a whiteboard. <p>Q How many legs can you see?</p> <p>Encourage children to count legs by whispering 1, 2 and saying 3 more loudly then whispering 4, 5 and saying 6 out loud. Say that you will write the numbers they say in a loud voice on the board underneath the creatures.</p> <ul style="list-style-type: none"> Add a third creature and repeat the process. Repeat until all ten creatures are on the board and the numbers 3, 6, 9, 12, 15, 18, 21, 24, 27 and 30 are written on the board. <p>Count in threes from 3, pointing to the numbers on the board.</p> <ul style="list-style-type: none"> Take down the creatures and then give them out to ten children, ask four children to come up to the front. <p>Q How many legs can you see? Let's count in threes to find out: 3, 6, 9, 12.</p> <ul style="list-style-type: none"> Repeat for different numbers of creatures. Encourage children who are finding this difficult to use the whispering and saying out loud strategy used earlier. Ask the children to draw sets of the three-legged creatures in their books and record the number of legs in each set. 	<ul style="list-style-type: none"> Display a 0–30 number line, and say that you are going to count in threes along the number line. <p>Q Which numbers do you think we will say?</p> <p>Q Will we say the number 2? 10?</p> <p>Count in threes to 12, marking the jumps on the number line and circling the numbers that they land on.</p> <p>Ask for a volunteer to circle the next number. Repeat.</p> <ul style="list-style-type: none"> Use the number line to count in threes from zero to 30. <p>Q Imagine three Tripus, how many legs can you see?</p> <p>Q Now imagine five, how many legs can you see?</p> <p>By the end of the lesson, children should be able to:</p> <ul style="list-style-type: none"> mark hops of 3 on a number line to at least 20. Say the numbers you land on; say which number comes next. <p>(Refer to supplement of examples, section 5, page 6.)</p>

Planning sheet	Day Two	Unit 8 <i>Counting, properties of numbers and reasoning about numbers</i>		Term: Summer	Year Group: 1														
Oral and Mental		Main Teaching			Plenary														
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions															
<p>Begin to count in steps of 3 from zero.</p> <p>Know by heart addition facts for each number to 10.</p> <p>VOCABULARY count on threes how many? add plus together makes</p> <p>RESOURCES Coathanger Nine pegs Cloth</p>	<ul style="list-style-type: none"> Count in threes with the class by whispering 1, 2 and saying out loud 3, etc. <p>Q Who can tell me a number that we said in a loud voice?</p> <p>Q If we count in threes what number will I say after 6?</p> <ul style="list-style-type: none"> Show the children a coathanger with nine pegs on it. <p>Q How many pegs are on the coathanger?</p> <p>Ask the children to show you the answer using their fingers. <ul style="list-style-type: none"> Now cover up five of the pegs by sliding them to one end underneath a cloth. <p>Q How many pegs can you see?</p> <p>Q So how many pegs are hidden underneath the cloth?</p> <p>Ask the children to respond using fingers. Encourage them to count on from the number they can see to 9 to work out the answer.</p> <p>Say 5 and 4 is 9. Write on the board $5 + 4 = 9$. <ul style="list-style-type: none"> Repeat hiding different numbers each time. </p></p>	<p>Count in steps of 3 from zero.</p> <p>Solve simple mathematical problems or puzzles.</p> <p>Recognise and predict from simple patterns and relationships.</p> <p>VOCABULARY count in threes how much? how many?</p> <p>RESOURCES Resource sheet 8.2 Bag or box Envelopes Postcard Purse 2p coins Large 0-20 number line</p>	<ul style="list-style-type: none"> Show the children a 3p stamp (Resource sheet 8.2). Explain that the Post Office only had 3p stamps left and that you bought ten of them. <p>Q How much did I spend on the stamps?</p> <p>Count in threes touching each stamp to keep count. <ul style="list-style-type: none"> Show the children an envelope and explain that it will cost 12p to post it. <p>Q How many 3p stamps do I need to stick on my letter?</p> <p>Encourage children to count in threes until they reach 12, model on a number line by holding up a finger on each count: 3, 6, 9, 12. Count the 4 fingers and agree they represent the 4 stamps. <ul style="list-style-type: none"> Show a postcard to the children and say that this will cost 6p to send. <p>Q How many stamps do I need to stick on my postcard?</p> <p>Model holding up a finger for each count: 3, 6; say 'I need two stamps'. <ul style="list-style-type: none"> Put ten stamps in a box; ask for a volunteer to pull out some stamps. <p>Q Ali has five stamps. How much would these stamps cost him?</p> <p>Q How can we find out?</p> <p>Establish the amount by counting the stamps, saying 3p, 6p, 9p, 12p and 15p.</p> <p>Q If I took four stamps from the box, how much would they cost me?</p> <p>Establish the amount by counting the stamps saying 3p, 6p, 9p, 12p. <ul style="list-style-type: none"> 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. <p>Q What is the smallest amount you could spend?</p> <p>Q How can you make sure that you find all the possible answers?</p> <p>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.</p> </p></p></p></p>	<ul style="list-style-type: none"> Collect all answers, writing them in a table on the board: <table border="1"> <thead> <tr> <th>Number of stamps</th> <th>Cost</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>3p</td> </tr> <tr> <td>2</td> <td>6p</td> </tr> <tr> <td>3</td> <td>9p</td> </tr> <tr> <td>4</td> <td>12p</td> </tr> <tr> <td>5</td> <td>15p</td> </tr> <tr> <td>6</td> <td>18p</td> </tr> </tbody> </table> <p>Q What is the largest amount I could spend?</p> <p>Q How much would four stamps cost me?</p> <p>Q If my letter is going to cost 18p to post, how many stamps do I need to buy?</p> <ul style="list-style-type: none"> Show the children a purse and explain that it has six 2p coins in it. <p>Q How much money is in my purse?</p> <p>Count the coins to establish that there is 12p.</p> <p>Q What other amounts could I make from the coins in my purse?</p> <p>Q How will I know if I have all the possible totals?</p> <p>Q Can we draw a table to help us?</p> <p>By the end of the lesson, children should be able to:</p> <ul style="list-style-type: none"> organise the recording of possibilities, e.g. in an ordered list or table <p>(Refer to the table of Problem Solving Strategies.)</p>		Number of stamps	Cost	1	3p	2	6p	3	9p	4	12p	5	15p	6	18p
Number of stamps	Cost																		
1	3p																		
2	6p																		
3	9p																		
4	12p																		
5	15p																		
6	18p																		

Planning sheet	Day Three	Unit 8 <i>Counting, properties of numbers and reasoning about numbers</i>	Term: <i>Summer</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>Recall doubles up to 5 + 5.</p> <p>Count on or back in steps of one.</p> <p>VOCABULARY threes count on</p> <p>RESOURCES Large dice</p>	<ul style="list-style-type: none"> Roll a large dice and ask the children to double the number rolled as quickly as they can and to show you the answer with their fingers. (If you roll a 6, roll it again.) <p>Q How might you work out the answer?</p> <p>Encourage the children to put the same number of fingers up on each hand to help.</p> <ul style="list-style-type: none"> Repeat. Sketch a 0-10 number line on the board. <p>Q If you count on from 7 to 10, how many jumps will you take?</p> <p>Q If you count on 4 from 3, what number will you land on?</p> <p>Encourage the children to count on using fingers as well as referring to the number line.</p> <p>Q If you count back from 10 to 6, how many did you count?</p> <p>Q If you count on 2 from 6, what number will you land on?</p> <p>Q If you count on 3 from 5, what number will you get to?</p>	<p>Recognise and extend number sequences with differences of 1, 2 or 3.</p> <p>VOCABULARY pattern sequence twos threes ones even odd difference rule</p> <p>RESOURCES Resource sheet 8.3 (copied and cut out for pairs to use) Flat shapes Whiteboards</p>	<ul style="list-style-type: none"> Write on the board the sequence 3, 6, 9, 12. <p>Q What is the difference between the neighbouring numbers in the sequence?</p> <p>Q Can anyone describe this sequence of numbers? What is the rule?</p> <p>Q What would the next two numbers be?</p> <ul style="list-style-type: none"> Write on the board the sequence 2, 4, 6, 8. <p>Q Can anyone describe this sequence of numbers? What is the rule?</p> <p>Q What would the next three numbers be?</p> <p>Ask the children to write the next three numbers on their whiteboards. Encourage the children to use the term even numbers to describe the numbers in this sequence.</p> <p>Q Would 18 be in this sequence? How do you know?</p> <p>Agree that it is an even number and so will be in this sequence.</p> <ul style="list-style-type: none"> Write on the board the sequence 1, 3, 5, 7. <p>Q Can anyone describe this sequence of numbers? What is the rule?</p> <p>Q What would the next three numbers be?</p> <p>Ask the children to write the next three numbers on their whiteboards. Encourage the children to use the term odd numbers to describe the numbers in this sequence.</p> <p>Q Would 19 be in this sequence? How do you know?</p> <ul style="list-style-type: none"> Write on the board the sequence 2, 5, 8, 11. <p>Q What is the rule in this sequence?</p> <p>Encourage the children to find the difference between the numbers in the sequence by counting on from the previous number to the next.</p> <p>Q What would be the next two numbers?</p> <p>Ask the children to write the next two numbers on their whiteboards.</p> <ul style="list-style-type: none"> Pick one of the instruction cards from Resource sheet 8.3, read the instructions and ask children to make suggestions. Check the difference between each consecutive pair of numbers. <p>Give out sets of problems from Resource sheet 8.3. Ask the children to work in pairs taking it in turns to count and check.</p>	<ul style="list-style-type: none"> Ask a pair to choose one of the challenges on Resource sheet 8.3 and explain what they did. Draw a repeating pattern on the board using dots and dashes. ----- <p>Q Who can describe what is happening in this pattern? What would come next?</p> <ul style="list-style-type: none"> Draw a repeating pattern on the board using triangles and circles. △○○△○○△○○△ <p>Q Who can describe what is happening in this pattern? Can you continue the pattern?</p> <p>Ask for a volunteer to use some flat shapes to make a repeating pattern on the board.</p> <p>Q Who can continue the pattern Naz has started?</p> <p>HOMEWORK – Use three different shapes to make a repeating pattern.</p> <p>By the end of the lesson, children should be able to:</p> <ul style="list-style-type: none"> describe the rule of a pattern or a number sequence in words or pictures; predict the next few terms in a sequence to test the rule; use the rule to decide whether a given number will be in the sequence or not. <p>(Refer to the table of Problem Solving Strategies.)</p>

The Tripus





Count on in threes.
Start at 3.
How far can you count?

Count on in twos.
Start at 2.
How far can you count?

Count on in tens.
Start at 6.
How far can you count?

Count back in
threes.
Start at 30.

Count back in twos.
Start at 20.

Continue this sequence on a
whiteboard:
1, 4, 7, 10
Get your partner to check it.

Continue this sequence on a
whiteboard:
30, 29, 28, 27
Get your partner to check it.

Continue this sequence on a
whiteboard:
1, 3, 5, 7
Get your partner to check it.

Continue this sequence on a
whiteboard:
5, 10, 15
Get your partner to check it.

Continue this sequence on a
whiteboard:
100, 90, 80, 70
Get your partner to check it.