Teaching Notes

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Counting, pp. 2–3

Teaching Focus: to explore place value, counting and equations up to 100

- Have children look at the picture. Ask, *What do you think this is a picture of?* (eg animals, a jungle) Encourage vocabulary associated with jungles, eg vines, reeds, palm trees, etc. Point to the river running through the picture. Ask, *What is this? How can you tell?*

Locational language

- Point to a monkey. Say, *This is a monkey. Can you find some other monkeys in the picture?* Ask, *How many monkeys are there?* Encourage children to use locational language when identifying the location of the monkeys, eg *I can see a monkey… behind the palm tree, near, between, on top of, below, to the left, to the right, between, etc.* Discuss and list locational language.
- Point to the group of crocodiles at the base of p. 2. Ask, *How many crocodiles are there? How many crocodiles are there altogether?* Encourage children to use locational language when locating crocodiles and what they are doing, eg *The crocodiles are swimming through the reeds.*
- Point to the ants' nest. Ask children to describe the ants' path, eg *The path goes up the tree, across the vine, down the tree, through the log, behind the tree.*
- Point to the spider webs. Ask, *Which spider web has the most/least spiders?* Point to the lily pads. Ask, *Which group of lily pads has the least/most frogs?*
- Point to the tigers. Ask, *What animal is to the left/ right of the tigers?* Point to the spider web on the p. 2. Ask, *Are the frogs to the left or right of the spider web?* Point to the jungle flowers near the boa constrictor. Encourage children to use location language to describe the location of the flowers, eg *They are between the two small trees. They are in front of the large, thick tree.*
- Encourage children to use location language: next to, far away, between, near, under, over, to describe the position of other animals on the page.
- Encourage children to use language (heavier than/ lighter than: ant, tiger, frog, crocodile), (tallest/ shortest: trees), (longer/shorter: snakes, boa constrictors) to describe animals and the vegetation on the page.

Counting/number facts

- Identify and count birds in nests and birds flying away from nests (three nests have number facts to 10 and two nests have number facts to 20), eg 8 birds in the nest/2 flying away, 6 birds in nest/4 flying away, 9 birds in nest/1 flying away, 15 birds in nest/5 flying away, 17 birds in nest/3 flying away. Discuss number facts and make up equations/number stories about the nests.
- Use 'birds' nests equations' as an example of how you can use known facts to work out missing addends. Write equations as 8 + __ = 10, 6 + __ = 10 and/or 10 – __ = 8, 10 – __ = 6, etc. Discuss the relationship between addition and subtraction.
- Extend number facts 10/20 to number facts 100/200 by using tens fact. Look at nest with 8 birds + 2 birds flying away. Discuss relationship between 8 + 2 = 10, 10 – 2 = 8 to 80 + 20 = 100, 100 – 20 = 80. Discuss similarities/strategies to assist with working out equations (tens fact).
- Point to one group of butterflies. Ask, *Can you find some other groups of butterflies?* Make up number stories/equations about the butterflies. Discuss repeated addition: 4 + 4 + 4 = 12 (3 groups of 4 makes 12). Use calculators to show repeated addition.

Place value

- Point to a bundle of reeds at the base of p. 2. Ask, *How many reeds are in this bundle?* Point to another bundle of reeds and repeat the question. Point to several bundles of reeds (eg 4 bundles along the base of p. 2) and ask, *How many reeds are here?* Encourage children to discuss strategies they used, eg There are 4 bundles of 10 reeds, so there are 40 reeds. Make up number stories/equations about the reeds. Identify the remaining reeds in and along the river. Point to isolated reeds and ask, *How many reeds are here?* Point to bundles of reeds and individual reeds and ask, *How many reeds are there altogether?* (Combinations of 5 bundles and 2 reeds, 10 bundles, 4 bundles and 2 reeds, 3 bundles and 5 reeds, 1 bundle and 2 reeds exist along the river bank [brown tops] and there are 8 bundles of reeds in the river [yellow tops].) Encourage children to discuss quantities of reeds based on the place-value units of tens and ones, eg There are 4 bundles of 10 reeds and 3 reeds. That makes 4 tens and 3 ones: 43. Discuss quantities of reeds in each group and order them from smallest to largest, eg 4 bundles and 2 reeds is larger than 3 bundles and 5 reeds, that is, 42 is larger than 35. Encourage children to make up number stories/equations about the reeds. Check equations with a calculator.
- Identify groupings of reeds and record, eg 42 reeds, 52 reeds, etc. Discuss the concept of 'rounding' Ask, *Is 42 reeds closer to 40 reeds or 50 reeds? Why?* Repeat with other reed groupings.

Counting On, pp.4–5

Teaching Focus: to explore addition equations using the 'count on' strategy

- Say, *We are going to play a counting game. We are going to count by 1s starting at 1, eg 1, 2, 3, …20.* Say, *Now I would like you to start counting by 1s, but this time start at 3 (3, 4, 5…).* Model 'counting on' to children, demonstrating that to 'count on' it is always easier to put the number in your head and/or to say the number out loud that you are counting on from. Talk to children about this strategy and practise it from random numbers between

0–20/20–100. (eg *When we count on, we just keep counting on 1 more from a number that we say out loud or say in our head.*) Use the number line at the base of the page to to reinforce the count on strategy.

- Say, *We are going to learn a trick on how to do addition/plus sums/equations. The trick will make the equations easier to do. It is a special trick because all you have to do is put a number in your head and count on. It is called 'counting on'.* Point to the top left-hand picture on p. 4. Say, *Look at the picture. The boy is adding 5 + 3. Instead of counting out 5, then counting out 3, then adding them together, he just puts the first number in his head (5) and counts on 3 (6, 7, 8) to get the answer.* Talk about how he uses his fingers to count on 3. Look at the number line to show what he does. Encourage children to practise the count on strategy by copying the boy in the picture. Ask, *When you count on do the numbers get larger or smaller? Is it better to have the larger or smaller number in your head when you are using the count on strategy? Why?*
- Say, *Look at the next picture (2 + 4 = 6).* Say, *We could do it the long way by counting out 2 and then counting out 4, then adding them together to get the answer, but there is a trick way/an easier way to do it.* Say, *Do you know how to do it an easier way?* Encourage children to discuss the count on strategy. Discuss the commutative property of addition. Say, *It is easier to put the larger number in your head and then count on from it.* Use a calculator to test the commutative property (2 + 4 = 4 + 2). Continue to check this property by adding the other number.
- Look at remaining pictures. Complete the equations using the count on strategy. Ask, *Does the count on strategy work with all numbers? Does it matter if the first number is big or small? Why not? Can you use the count on strategy to work out all addition equations?* Use the number line and calculators to check answers.
- Use the number line and count on strategy to work out random addition equations involving teen numbers.

Extension
- Practise the count on strategy with children counting mentally rather than using fingers or concrete materials.
- Use count on methods when adding a large number with a smaller number, eg 2 + 34. Say, *34 and count on 2.*

Doubling, pp. 6–7

Teaching Focus: to understand the concept of doubling numbers to 6/10

- Have children look at first group of 3 strawberries on p. 7 and then the second group of strawberries. Ask, *What can you tell me about these 2 groups of strawberries?* Encourage the use of words/phrases such as, 'same', 'they are the same', 'they look like each other'.
- Have children look the first group of 4 dogs and then the second group of dogs. Ask, *What can you tell me about these 2 groups of dogs?*
- Have children look at the picture of the '1' domino. Point to the first dot and then the second. Ask, *What can you tell me about these 2 dots?* Say, *When you add 1 dot and 1 dot you get 2 dots. This is called a 'double'. If you double 1 you get 2.*
- Have children look at the picture of the '2' domino. Point to the first 2 dots and then the second 2 dots. Say, *When you add 2 and 2 together you get 4. When 2 of the same number are added together we call this a 'double'. Ask, Double 2 is …?*
- Have children look at each remaining domino/es. Ask, *If you double 3/4/5/6 what do you have to do?* Say, *Double 3/4/5/6 is…? What happens when you double a number? Does the number get bigger or smaller?*
- Have children look at the pictures of strawberries. Say, *When 2 of the same group of pictures/items are added together we call this a 'double'.* Ask, *If you double 3 strawberries how many do you get? How did you work out that double?*
- Have children look at the remaining pictures. Ask, *What is the double of 4 dogs/2 cars/6 flowers/1 apple/5 cakes? How did you work it out? What happens to all numbers when you double them?* (eg they get bigger, they are all even) Ask, *How can we use doubling to help us do plus/addition equations? Discuss the relationship between addition and multiplication, eg 2 + 2 is the same as 2 groups of 2.*
- Extend to include doubling to 10. Use a calculator to solve 'doubling' equations (eg double 5:10). Ask, *What do you think the answer will be? Why?*

Extension
- Discuss 'odd' and 'even' numbers. Discuss that 'even' numbers are created by doubling.
- Discuss the opposite of doubling — halving. Ask, *Is there more or less? Does the number get bigger or smaller?*
- Play doubling games with number cards or a deck of playing cards. Discuss 'near doubles' (see *Nelson Maths Building Mental Strategies Year 3,* p. 10).

How Many? (concept of 100), pp. 8–9

Teaching Focus: to explore the concept of 100 (quantity, place value, making and breaking to 100 using groups of 10)

- Have children look at the picture. Ask, *What can you see in this picture? What are the frogs doing? How many frogs do you think there are?* Encourage children to discuss the reasoning behind their responses. Encourage vocabulary, such as many, lots, a large number, more than, etc.
- Ask, *How can we find out how many frogs are in the picture?* (eg count each frog) *How many frogs are leaping about on the ground?* (see top of p. 9) *How many lily pads are empty? Is there a lily pad for every frog? How many frogs are there in the whole picture?*

How many lily pads are there in the whole picture? Do you know a quick way of working out how many frogs there are? Discuss strategies, eg counting by 10s.

- Chant/count by 1s from 0 to 100.
- Point to each row of frogs and say, *We are going to count by 10s (10, 20, 30, … 100).* Chant/count by 10s from 0 to 100.
- Point to individual frogs in the first 3 rows, eg touch the 4th frog in the third row on p. 8, that is, frog number 24. Say, *If there are 100 frogs in this lily pond, what number frog is this one?* Discuss strategies, eg It must be 24 because the first row is 10, the second row is 20 and there is 4 more. That makes 24: 2 tens and 4 ones. Repeat with other frogs, encouraging children to use place-value strategies to work out the number. Select a frog and enter its number into the calculator. Reread the number. Discuss the value of the digits (tens and ones).
- Cover rows of lily pads using paper, eg cover the last 5 rows on p. 9. Ask, *How many lily pads can you see? How many lily pads are hidden?* Repeat by covering other rows.
- Have a look at the frogs in the first row on p. 8. *Are they the same/different? Look at the frogs in the second row? Do any of the frogs look the same as the first row? What do you notice?*
- Place counters/blocks on the lily pads. Ask, *How many counters/blocks are there?*

Extension
- Use materials, eg grains of rice, pasta or counters to estimate what 100 looks like. Discuss strategies to estimate the materials, eg count out one by one to ten then estimate further groups of 10 until you reach 100, group into 10s and count.

Number Combinations, pp. 10–11

Teaching Focus: to investigate number facts to 10, making and breaking numbers, and commutative law of addition

- Have children look at the first bag of marbles on p. 10. Ask, *How many marbles are there in the bag? How many red marbles are there? How many yellow marbles are there?* Discuss possible addition and subtraction equations that can be made using the marbles. Ask children to discuss strategies that they discover when 'making and breaking' the marbles, eg The same numbers are used. The numbers change position in the equation. Using a calculator make up addition and subtraction equations using a combination of 3 numbers (1, 2 and 3).
- Have children look at the remaining bags of marbles and repeat the questions.
- Discuss strategies that can be used to solve addition equations, eg the count on strategy. Ask, *Should we put the larger or smaller number in our head first? Why?*
- Look at each bag of marbles again and discuss other combinations by 'making and breaking' the marbles in a different way so that there is the same number of marbles in each bag, eg the 2 yellow and 8 red marble bag could be represented as 3 and 7. Discuss the combinations. Ask, *Is there another way that this bag of marbles can be separated?* Continue to discover other combinations.

Extension
- **Add 10/tens fact:** Have children look at the first bag of marbles on p. 10. Say, *Add 10 to each number in the bag of marbles so that there is 10 and 20 marbles respectively.* (This can be drawn or represented using concrete materials.) Ask, *How many marbles are there in the bag? How many red marbles are there? How many yellow marbles are there?* Compare the 1 and 2 bag of marbles to the bag of marbles where each marble is increased by ten: 10, 20, 30. Ask, *What pattern can you see?* Say, *Look at the tens/ones.* Ask, *Are they the same in any way?* (The numbers are the same but a zero is added.) Discuss adding zero to numbers and solving addition/ subtraction equations.
- Continue 'making and breaking' with other numbers, eg 20 and 5 is 25.
- Explore near doubles (marble bag 3/4, 1/2, 2/3, 5/4). Look at addition equations using these numbers. Discuss the 'near doubles' strategy to assist with working out the equations, eg bag 3/4 think 3 + 3 and 1 more make 7, or 4 and 4 and 1 less make 7. Use the near doubles strategy to solve other equations, eg 3 + 4, 5 + 6, 6 + 7, 7 + 8, 8 + 9, 9 + 10, 10 +11, 11 + 12, etc.
- For the following activities, focus on the number line on pp. 18 and 19 or draw a number line from 0 to 10 on the board.

'Count up to' strategy: Explore the equation: 6 – 4. Ask children to count on their fingers from 4 up to 6 or move their fingers on the number line 4, 5, 6. Ask, *What did you have to add to 4 to get to 6?* (answer 2)

'Count back to' strategy: Explore the equation: 6 – 4. Ask children to count back from 6 to 4. Point to 6 on the number line or ask children to think about 6 in their head. Ask, *How many did you count back to get to 4? … 5, 4* (answer 2)

'Count down to' strategy: Explore the equation: 6 – 4. Have children start at 6 and count down until they reach the number they are taking away: 6, 5, 4 (I went down 2). Ask, *How many jumps did you go down?* (answer 2)

Teen Numbers, pp. 12–13

Teaching Focus: to explore teen number patterns, and counting on to 20

- Have children look at the hands on p. 12. Ask, *What can you see?* Point to the picture that shows two hands only. Say, *Show me your two hands.* Ask, *How many fingers do you have on your two hands?* Point to the picture and the number 10. Say, *The two light-coloured hands make 10.* Point to the dark-coloured hand underneath and ask, *How many fingers/thumbs are here?* Ask, *How did you know?* Say, *When you see two light-coloured hands it equals 10.* Ask, *Do you have to keep counting every time you see*

two dark-coloured hands? Why not? (Suggest, *You can remember that two light-coloured hands makes 10. This can be used to assist with the count on strategy.*)
- Further discuss the count on strategy with children. Look at pictures and say, *We know that two light-coloured hands makes 10 so 4 more/5 more/6 more makes 14/15/16.* Repeat with other numbers.
- Ask, *Can you show me 11?* (Depending on whether children understand the count on strategy they will either: count out 10 fingers then put fingers down and then put up 1 more finger, or flash 10 fingers and then put 10 fingers down and put up 1 more finger.) Point to the picture of 11 fingers (finger/ thumb). Say, *There are 10 light-coloured fingers that makes 10, and 1 dark-coloured finger/thumb —10 and 1 make 11.*
- Ask, *Can you show me 12?* Repeat for 13, 14, 15, 16, 17, 18, 19, 20. Focus on the number and the fingers, eg Say, *The 10 in 14 is the 10 light-coloured fingers and the 4 in 14 is the 4 dark-coloured fingers.* Repeat for other numbers. Highlight that the number of dark fingers changes the value of the number. Discuss the words: fourteen (has the word four), sixteen (has the word six), seventeen/ eighteen/nineteen in the same way. Discuss other numbers: eleven, twelve, thirteen, fifteen. Say, *You cannot hear smaller numbers in these words.*
- Make up simple equations using light and dark fingers. Record as number stories or equations, eg 10 and 2 makes 12, 12 take away 2 makes 10.
- Point to the first ten frame on p. 13. Ask, *How many dots are in this ten frame? How did you know?* Point to the ten frame underneath it. Ask, *How many dots are there? Are there the same number of dots?* Repeat with all 10 full ten frames. Say, *Every time you see a full ten frame you will know that there are 10 dots in each.*
- Look at the first row of 2 ten frames. Point to the numeral 10. Say, *This is 10.* Point to the 2 tens frames below. Say, *If we know how many are in this full ten frame* (10) *and the ten frame next to it has 1 more, how many are there altogether?* (11). Repeat with all 10 ten frame numbers. Discuss that the teen numbers all have 10 in them, but the number of ones changes.
- Key teen numbers into a calculator. Discuss place value when reading and entering numbers.
- Record addition equations with teen numbers, eg10 + 1, 10 + 2, 10 + 3, 10 + 4, 10 + 5, 10 + 6 … Discuss the strategies of using place value or the count on strategy to solve equations. Use a calculator to check. Discuss what happens when 10 + 2 is keyed in (the 0 is replaced by the 2).

Place Value, pp 14–15

Teaching Focus: to investigate place value with numbers to 99

Page 14 (bundles of sticks)
- Chant by 10s to 100: 10, 20, 30 … 100.
- Have children look at the container of craft sticks. Say, *If you count out 10 sticks and put a band around them it will look like this.* (Point to the bundle of 10.) Say, *This is one bundle of 10.* Point to the 2 bundles of 10. Ask, *How many sticks are here? How did you know?* Point to each bundle in the 20 section and say *10, 20. There are 20 sticks. One bundle of 10 + one bundle of 10 makes 20.* Use a calculator to reinforce the concept of bundles of 10, key in 10 + 10 to reinforce that it equals 20.
- Point to the 3 bundles of 10. Ask. *How many sticks are here? How did you know?* Point to each bundle and say, *10, 20, 30. There are 30 sticks. One bundle of 10 + one bundle of 10 + one bundle of 10 makes 30.* Repeat with the remaining bundles of 10. Ask, *Would you still get the same answer if you counted each individual stick? Why? Which way is quicker, counting individual sticks or bundles of 10? Why?*
- Explain the relationship between counting forward by groups of 10 and addition:10, 20 is the same as 10 + 10; 10, 20, 30 is the same as 10 + 10 + 10. Repeat with numbers to 100.

Page 15 (place-value chart)
- Point to the place-value chart. Say, *This is a chart that shows us tens and ones.* Point to the 2 bundles of sticks and ask, *How many bundles of 10 are there?* Point to the numeral 2 and say, *There are 2 bundles of 10.* Point to the individual sticks. Ask, *How many sticks are here?* Point to the 4 and say, *4 sticks or 4 ones.* Discuss the value of each number. Ask, *How many tens? How many ones? What number is greater in value/is bigger, the 2 or the 4 in 24. Why? What number is smaller? Why?* Point to the 2 bundles and 4 individual sticks. Say, *2 tens and 4 ones makes 24.* Using bundles of sticks have children make their own numbers (up to 99) on the chart. Use adhesive paper to write the matching numbers.

Estimation skills (to practise the concept of estimating bundles of 10)
- Estimate large number of objects, eg counters, sticks, straws by bundling them into groups of 10. Encourage children to count out 10 and place as a separate group. Invite children to estimate further bundles of 10 and place as separate groups. When all objects are counted, count up the bundles of 10, eg 7 bundles of 10: 10, 20, 30, 40, 50, 60, 70 to work out the number of objects. Record the numeral in a place-value chart.

Number Mat, p. 16

Teaching Focus: to explore place value, and addition and subtraction computation

Number recognition
- Have children look at the number mat. Ask, *What numbers can you see?*
- Point to a number and ask, *What number is this? What number comes after this number? What number comes before this number?* Point to another number and ask, *Can you find a number that is smaller than/ larger than this number? What is it? How do you know*

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it is bigger/smaller? Discuss strategies used to answer the question, eg counting mentally/out loud, using the place value of the digits to work out the value, referring to number charts.

- Have children look at the number mat and find numbers that are bigger/smaller than a given number. Say, *I am thinking of a number in row 7 that is bigger than 30 but less than 64. What number could I be thinking of? I am thinking of a number in row 4 that is smaller than 70 but bigger than 50. What numbers could I be thinking of? I am thinking of a number that is 10 less than 82. What number am I thinking of? I am thinking of a number that is 10 more than 26. What number am I thinking of?* Repeat for other numbers. Continue to ask questions that involve children working out the number. Select children to have a turn. Have the remaining children work out the number by asking questions.

- Have children look at the mat and find numbers based on place value. Say, *I am thinking of a number that has a 3 in the tens column.* Ask, *What numbers could it be? I am thinking of a number that has 4 in the ones column.* Ask, *What numbers could it be?* Continue to ask questions that involve children working out what number/s you are thinking of. Select children to have a turn. Have the remaining children work out the number by asking questions.

- Have a look at the number mat. Say, *Can you find two numbers that have the same digits, but different values?* (eg 25/52, 92/29, etc). Continue to ask questions that involve children working out the number. Select children to have a turn. Have the remaining children work out the number by asking questions.

Equations

- Have children look at the number mat. Ask, *Can you find a number that is 5 more than 10/7 more than 63/1 more than 6/2 more than 3/3 more than 7/1 less than 16/2 less than 14/3 less than 10,* etc. Encourage children to discuss strategies they used, eg counting on, counting back/counting down, referring to number charts, place value, knowledge of whole-part relationship of numbers. Encourage children to select the appropriate operation to complete the number sentences. Discuss strategies used, eg 2 less than 14 means 14 − 2. Record the equations. Use a calculator to check answers.

Extension
- Point to two numbers and ask children what the difference between the two numbers is, eg Say, *What is the difference between 30 and 10?*
- Point to a number, eg 36. Say, *Count back 1. What is the number?* Repeat with other numbers.
- If children are familiar with grid co-ordinates have them identify numbers, eg ask, *What number is at the co-ordinates D5/B3/C6?* Have children ask each other similar questions.

2s and 10s Patterns, p. 17

Teaching Focus: to explore number patterns (2s to 20, 10s to 100), skip counting and the relationship between counting forward an equal number to form a number pattern

- Have children look at the 2s and 10s number mat. Say, *What numbers can you see?* Encourage children to identify as many numbers as they can. Point to a number and ask, *What number is this? What number comes after/before this number?* Point to a number and ask, *Can you find a number that is smaller than/ bigger than this number? What is it? How do you know it is smaller/bigger?* Ask children to find matching numbers on the 1 to 100 and 0 to 99 number charts (pp. 20 and 21).

- Point to number 2. Ask, *What number is 2 more than this number?* Say, *Find it on the mat.* Repeat with numbers 4, 6, 8, 10, 12, 14, 16, 18. Record the numbers 2 more on the board and/or identify them on the 'number line' at the top of p. 17. Say, *What do you notice about these numbers? Can you see a pattern.* Say, *Look at the numbers at the top of the number mat. What do you notice?* Say, *This is the 2s pattern. It is when we count by 2s/skip count by 2s.* Encourage children to chant the 2s pattern to 20.

Talk about odd/even numbers and the pattern that occurs with the 2s pattern (all numbers are even). Discuss repeated addition and the 2s number pattern. Use calculators to show repeated addition. This same procedure can be used with 2 less.

- Point to number 10. Ask, *What number is 10 more than this number?* Say, *Find it on the mat.* Repeat with the numbers 20, 30, 40, 50, 60, 70, 80, 90. Ask, *What number is 10 more/10 less than this number?* Record the numbers 10 more on the board and/or identify them on the 'number line' at the base of p. 17. Say, *What do you notice about these numbers? Can you see a pattern.* Say, *Look at the numbers at the bottom of the number mat. What do you notice?* Say, *This is the 10s pattern. It is when we count by 10s/skip count by 10s.* Encourage children to chant the 10s pattern to 100. Talk about odd/ even numbers and the pattern that occurs with the 10s pattern (all numbers are even). Discuss repeated addition and the 10s number pattern. Use calculators to show repeated addition. This same procedure can be used with 10 less.

- Order numbers on the mat from smallest to largest.

- **Game for 2 players/2 teams:** Each player/team selects a number pattern, eg Player/Team A selects the 2s pattern and Player/Team B selects the 10s pattern. Each player/team will need 10 counters of the one colour. Write the numbers from the number mat on separate cards. Place these face down in a pile. In turn, players/teams turn over a card. If the card selected is the first card in the player's/team's pattern (eg 2 or 10) they keep the card and place a counter on the corresponding number on the mat. If it is not, they return the card to the bottom of the pack. Play continues in this way until a player/team has placed all their counters (in order) on all the numbers in their pattern. Number 10 is a bonus number; it can be used by both teams/players.

Number Lines, pp. 18–19

Teaching Focus: to explore the value of numbers, simple equations and number facts to 100

Green number line 0–20
- Have children look at the green number line (0–20). Say, *This frog is going to jump along the number line.* Ask, *What numbers can you see? What number is the biggest/smallest?*

- Use the number line to count, that is, forwards by 1s starting at 0/forwards by 1s starting with a number other than 0/backwards from any number. Repeat counting orally without a number line.

- Point to a number on the green number line, eg 14. Ask, *What number comes after/before this number? How did you work it out?* Discuss strategies, eg I moved my finger. I jumped the frog to the next number.

- Play the 'Number Clues/Mystery' game. Say, *I am thinking of a number. It is after 15. What number is it? I am thinking of a number. It is before 18. What number is it? I am thinking of a number. It is bigger than 6. What number is it? I am thinking of a number. It is smaller than 4. What number could it be? I am thinking of a number. It is between 16 and 18. What number is it? I am thinking of a number. It is bigger than 15 but smaller than 19. What number could it be?* Continue with other questions. Discuss strategies used to work out the answers. Model the strategies used by writing the numbers on the board and eliminating numbers that could not be the answer, eg if the number is bigger than 6 cross out 0, 1, 2, 3, 4, 5, 6. Encourage children to think about the possible answer rather than just guessing it. Ask, *What helped you to work out the answer?* Discuss count on/count back strategy.

- Play the 'Less/More' game. Say, *I am thinking of a number that is 5 less/more than 13. What number am I thinking of?* Repeat with other numbers. Record as a number story or equation.

- Discuss skip counting with children. Model skip counting on the number line, eg: 3, 6, 9, 12, … Ask children to record the skip counting patterns. Discuss patterns that occur, eg When you skip count by 3s there is a mixture of odd and even numbers/the numbers get bigger/there is always 3 between each number. Repeat with other skip counting patterns. Skip count starting with different numbers, eg skip count by 2s from 2 and then from 3. Discuss similarities and differences.

- Use the number line to count by 3s/4s/5s from zero. Use a calculator to confirm the pattern.

- Play the 'Detective' game. Select a number or choose a child to think of a number. Write the number down on a secret piece of paper or write it on the board and hide it. Ask children to be 'detectives' and work out what the number is by asking questions that require a 'yes' or 'no' response. Encourage children to work out the answer by elimination rather than just 'guessing' the answer, eg *Is the number bigger than 16? Yes. Is the number less than 18? Yes. Is the number 17? Yes.*

- **Addition:** Use the green number line to work out addition problems. Say, *If the frog was on 14 and it jumped 2 places, what number would it be on?* Record as a number story, eg The frog was on 14 and it jumped 2 more places. It landed on 16: 14 +2 = 16. Using the number line follow the movement the frog would take. Repeat with other combinations.

- **Number patterns:** Say, *Help the frog jump by 2s.* Ask children to point with their finger the path the frog would jump: 0, 2, 4, 6, 8, 20. Using the number line follow the movement the frog would take.

- **Subtraction:** Use the number line to work out subtraction problems. Say, *If the frog was on 16 and it jumped back 12, what number would it land on?* Record as a number story, eg The frog jumped back 12 places from 16 and landed on 4: 16 − 12 = 4. Using the number line, follow the movement the frog would take. Repeat with other combinations.

Orange number line 0–100

- Have the children look at the orange number line (0–100). Say, *This kangaroo is going to jump along the number line.* Ask, *What numbers can you see?* Talk about the difference between the green and orange number lines. Ask, *Which number line is bigger? Why?*

- Point to a number on the number line, eg 25. Ask, *What number comes after/before this number?* Ask, *How did you work it out?* Discuss strategies.

- Play the 'Number Clues/Mystery' game, the 'Detective' game and the 'More/Less' game using the orange number line.

- Complete skip counting patterns (2s, 3s, 5s, 10s). Count forwards/backwards by 1s/10s. Use calculators to confirm the pattern.

Blank number line
- **Estimation:** use the blank number line to estimate where given numbers would be, eg point to the left-hand marker and right-hand marker and say, *If 30 is here and 40 is here, where would 45 be on the number line?* Repeat with different parameters, eg 1–100/20–25/20–50/20–100, etc.

- Choose numbers to place on the blank line (attach number cards). Increase the level of difficulty by selecting numbers that are greater in value (0–200) or by selecting numbers in different number sequences, eg 5, 10, 15 …; 10, 20, 30 …

Number Charts: 1 to 100 and 0 to 99, pp. 21–22

Teaching Focus: to explore place value of numbers from 0 to 100, skip count by 2s and 5s, and understand patterns in numbers (odd/even, 10 more/10 less)

Number identification and value
- Have children look at the 1 to 100 or 0 to 99 number chart. Say, *We can use the number chart to help us.* Point to individual numbers. Ask, *What number/s is this? Is this number/s bigger/smaller than xx number? What is 1 more/less than this number? What is 10 more/less than this number?* Encourage children to discuss the strategy they used to find the answer, eg I looked at the number and moved my finger/eyes back 1/10.

- Point to a number/s and say, *How many tens/ones does this number have?* (eg 36: Say, *How many tens in this number? 3 How many ones in this number? 6*)

- Point to a number and say, *Start at this number and count on/count back by 1s.*

Identify patterns in numbers
- Have children look at the 0 to 99 number chart. Point to 0. Say, *We are going to count by 2s. To do this we move up 2 numbers.* Point to the numbers and encourage children to chant: 0, 2, 4, 6, 8, 10, 12, etc. Ask, *What happens when we count forward by 2s?* (The numbers get bigger.) Ask, *Are the numbers odd or even? What patterns do you see?* (eg Point to 5. Say, *We are going to count by 5s.*) Repeat questions: *What happens when we count forward by 5s?* (The number gets bigger.) Ask, *Are the numbers odd or even? What patterns do you see?* Repeat with other patterns, eg 3s, 4s, 5s, 10s counting forwards from 0. Repeat with 1s, 10s counting back from 100.

- Repeat the above questions using the 1 to 100 number chart.

- Point to 4 on the 0 to 99 chart. Point to 14. Say, *How many do we have to count forward to get to 14? What is the difference between 4 and 14?* Point to each number and count from 4 to 14. Keep a tally of the difference (4 — 5, 6, 7, 8, 9, 10, 11, 12, 13, 14. We had to count 10 more.) Discuss the location of 4 compared to 14 (directly underneath). Point to 14, Ask, *What is 10 more than 14?* Encourage children to use the strategy: you just move 10 more. Repeat with other numbers, eg Start at 17/36 and count forward by 10s. Discuss and identify 10 more/10 less than a given number.

- Repeat the above questions using the 1 to 100 number chart.

Compare differences between 1 to 100 and 0 to 99 charts
- Look at both number charts. Ask, *How many numbers are in each row? What do you notice about the numbers in each column? Are the numbers same/different? Are the numbers the same in the tens column? Are the numbers the same in the ones column?* Look at numbers and identify numbers in each column, eg look at the 2 column, ask, *What do you notice about the numbers in the column?*

Extension
- Compare counting by 2s starting with an odd or even number, eg 1 or 2. Discuss the pattern.
- Count back by 10s starting at a given number.
- Use the chart/s to assist with addition/subtraction equations, eg 7 + 10 = 17, 17 − 10 = 7.

Adding 10, p.22

Teaching Focus: to explore the commutative property of addition, and the adding tens fact

- Have children look at the first group of cakes on the tray. Ask, *How many cakes are here?* Encourage children to count the cakes to confirm that there are 10. Look at the remaining trays that are the same (all contain 10). Talk about what 10 cakes on a tray looks like, eg The tray is full. There are two rows of 5, etc. Locate 10 on the number line.

- Look at the first group of cakes and the equation (10 + 2). Ask, *When you add 10 and 2 together what do you make?* Discuss the strategy/ies for quickly adding these numbers, using the count on strategy, using the number line. Discuss place value, that is, the tens stay the same, just add the ones. Record the answers on a place-value chart. Ask, *Does the number in the tens column change? Does the number in the ones column change? Why?*

- Ask again, *How many cakes do you have when you add 10 cakes and 2 cakes?* Ask, *How many cakes do you get when you add 2 cakes and 10 cakes? Does it matter what tray we add first?* (10 + 2 or 2 + 10). Encourage children to discuss/experiment with commutative property of addition (a + b = b + a).

- Look at the remaining trays. Discuss the 'adding 10' strategy and commutative property of addition.

- Complete with other equations (10 + 5, 10 + 8, 10 + 9, 10 + 1). Check answers with a calculator.

Extension
- Extend to equations containing 20, eg 20 + 1, 20 + 2, 20 + 3, etc. Record answers in a place-value chart. Ask, *Does the number in the tens column change? Does the number in the ones column change? Why?* Discuss strategies to work out the equations.

- Extend to equations that involve addition of 2-digit numbers (with a zero in the ones column: 30, 40,… 90) to 1-digit numbers. Discuss and develop generalisations about adding 1-digit numbers to 2-digit numbers with a zero in the ones column.

- Extend to involve adding two, 2-digit numbers ending in zero. Discuss 'tens fact', that is, 2 + 3= 5 so 20 + 30 = 50.

Snakes Add 10, p. 23

Teaching Focus: to investigate addition using tens fact and place value

- Have children look at the snakes and ladder chart. Point to number/s. Ask, *What number is this?* Find these numbers on the number line. Explain that when you land on a square with a snake's head on it, you must slide down the snake to its tail in order to move forward 10 places.

- Point to 3. Ask, *How many spaces would you move forward if you landed on the 3?* (10) Discuss strategies children used, eg count on from 3 until you get to 13. Point to 5. Ask, *How many would you move forward if you landed on the 5?* Repeat with remaining numbers and snakes. Ask, *How many do you move forward each time?*

- Point to 3. Ask, *If you move forward 10 spaces, what number do you land on?* Look at the digits involved: 3 and 13. Ask, *What is similar about these numbers?* (They both have a 3.) Ask, *What is the value of the 3 in both numbers? If you added 10 to 13 what number would you get?* (23) Discuss strategies children used, eg count on from 13 until you get to 23. Look at the digits involved 13 and 23. Ask, *What is similar about these numbers?* (The 3 stays the same and the number in the tens column changes.) Repeat until you have added 10 from 3 up to 93.

- Record the moving forward 10 spaces as number stories and equations, eg 3 + 10 = 13, 13 + 10 = 23, 23 + 10 = 33, 33 + 10 = 43, etc. Show this on a number line. Discuss the pattern that develops. Use a calculator to confirm the 'add 10' pattern.

- Chant by 10s starting at different 1-digit numbers. Use the chart to point to numbers as you add on 10. Discuss the pattern that develops, eg The numbers are directly under each other. The tens column changes value, that is, it goes up 10 each time.

Game (2 players or a teams)
- Explain to children that when you land on a square with a snake on it, you need to move forward (slide down the snake) to the square with the snake's tail. (You move forward 10.) In turn, roll a die and move forward that number of spaces. The first player/team to reach the 'Finish' square with an exact roll wins.

Before and After, p. 24

Teaching Focus: to explore numbers to 100

- Discuss the concept of 'before' and 'after'. Relate the terms to everyday experiences, eg I go to school after I brush my teeth. We have maths after play. I get into my pyjamas before I go to bed.

- Using the number lines on pp. 18 and 19 identify numbers that come before/after a given number. Ask, *What did you do to get the answer?* (eg I moved forward/back.)

- Discuss the concepts of 'less' and 'more'. Relate the terms to everyday experiences, eg I have more ribbons than you. You have less apples than me.

- Have children look at the shapes on the page. Say, *The number in the triangle will be the number that comes **before** the number in the square. The number in the circle will be the number that comes **after** the number in the square. Look at number 15.* Ask, *What number comes after/before 15? How did you work it out?* Discuss strategies used.

- Have children look at number 20/11/39/51. Ask, *What number comes before/after 20/11/39/51? How did you work it out?* Discuss strategies used.

- Have children look at the page. Say, *We are going to find out what number is 2 more than (a given number). To do this we think of the number in our head and count on 2.* Ask, *What number comes 2 after 15? How did you work it out?* Discuss strategies used. Repeat the questions using different numbers, eg 3 more, 4 more, 10 more, etc. Use the number lines on pp. 18 and 19 as support.

- Have children look at the page. Say, *We are going to find out what number is 2 less than (a given number). To do this we think of the number in our head and count back 2.* Ask, *What number is 2 less than 15?* Ask, *How did you work it out?* Discuss strategies used. Repeat the questions using different numbers, eg 3 less, 4 less, 10 less, etc. Use the number lines on pp. 18 and 19 as support.

- Increase difficulty by attaching different number cards to the blank boxes. (See *Nelson Maths AC TRB Foundation*, BLMs 46 and 47 for number cards.)

- Record the discussion as equations, eg 15 − 2 = 13, 15 + 2 = 17.

- Confirm before/after numbers by using a calculator.