

THE YEAR 2 DIAGNOSTIC NET

Supporting your child's number development

A Queensland Government Initiative
Supporting Literacy and
Numeracy Development
in the Early Years
of Schooling



QUEENSLAND
SCHOOL
CURRICULUM
COUNCIL



Learning About Number — some notes for parents

Number is a fundamental area of the primary mathematics program and a major focus of the Year 2 Diagnostic Net. An understanding of the principles and relationships associated with number is essential to enable people to function effectively in society. This understanding develops from birth and forms the basis for learning 'higher' mathematics, such as algebra and calculus.

Young children are naturally curious and eager to learn about the ideas and concepts associated with number. They begin to develop number concepts as they explore the mathematical ideas in the world around them. To support and extend their learning, teachers provide experiences which capture children's interest and challenge their thinking. These early experiences involve children in a range of matching, sorting, comparing, classifying and ordering activities. They include learning about counting patterns and ways of recording numbers and number relationships. They also provide children with opportunities to manipulate a range of materials and to talk with each other and with their teacher about what they are learning.

During these daily interactions, teachers carefully observe children's learning about number. To assist with this process, a *Number Developmental Continuum* has been supplied to all early childhood teachers. Use of the *Number Developmental Continuum* is one component of the Year 2 Diagnostic Net's focus on literacy and numeracy in the early years of schooling. This continuum provides teachers with a framework for observing children's learning in number.

The *Continuum* lists the milestones, or key indicators, of children's learning in relation to number. It groups these milestones into phases of development. Your child's teacher will use the *Continuum* to monitor your child's learning about number and to report to you about your child's progress.

The first four phases of the *Number Developmental Continuum* are explained in this pamphlet. For each phase, some suggestions are given about ways in which you can support your child's learning about number.

You have an important role in your child's learning and development. At home, you can support your child's learning about number by being interested in, and talking with your child about, his or her play experiences. Play provides children with opportunities to explore patterns and relationships, to investigate quantity and size, to think about similarities and differences and to talk about their thinking with their peers and with adults. During play, children learn about many of the basic ideas associated with number in an enjoyable and meaningful way.

Play may involve children in playing with sand and water, building with blocks, or solving puzzles. It may also involve children in everyday situations which use mathematics, such as cooking and shopping. Children's books, songs, games and rhymes also provide opportunities to learn more about number. You can extend your child's learning in these situations by talking with your child about what he or she is seeing, hearing and doing. By putting their thoughts into words, children are clarifying and refining their ideas about number.

If you have any questions or would like more information about learning about number, please contact your child's teacher.

Number

Phase A Exploring the Environment

From birth, young children are learning about the properties of, and relationships between, things and people in their environment. While exploring their surroundings, children are learning basic concepts and processes of mathematics.

Children are learning about quantity and the shape and size of objects from different perspectives and using different senses. They are investigating the consequences of their actions and performing repeated patterns of actions — for example, they enjoy the rhythms and patterns in rhymes, songs and finger plays. They are beginning to use language and drawings in their attempts to communicate their thoughts. Children are also acting out their experiences and expressing their feelings through imaginative play.

Key indicators

Children:

- display repeated patterns of actions
- investigate the consequences of actions
- explore the shape and size of objects from different perspectives
- explore the quantity of items in their environment
- use language to explain a pattern of actions, a collection of things or the connection between two things
- engage in imaginative play
- seek to represent their observations in drawings



Ways to help your child in this phase:

Provide your child with opportunities to explore different colours, shapes, sizes, tastes and textures.

Talk with your child about the properties of different objects and about their similarities and differences.

Provide your child with opportunities to sort objects with you — for example, *Let's put all the blue socks away.*

Provide your child with a variety of materials to play with, such as sand, water, containers for filling and pouring, playdough, plasticine, blocks, figures of different types, large sheets of paper and large-barrelled crayons, and clothes of different types and sizes.

Extend your child's learning during and after play by asking *tell me about ...*, *why ...*, *how ...*, *what might happen if ...*

Sing number rhymes with your child — for example, 'Three Blind Mice' and 'Six Little Ducks'.

To develop number sequences, recite number rhymes with your child — for example, 'One, two, buckle my shoe' and 'Ten Little Indians'.

Talk about numbers in nature — for example, *How many eyes do we have?* or *Do we have the same number of legs as a dog?* or *Let's count this spider's legs.*

Phase B Early Discoveries in Number

Children's learning continues to be closely linked with their immediate surroundings. During everyday situations, opportunities arise for children to learn about size, position, shape and number, while at the same time, they may be learning about colour, texture and taste.

Children are solving practical problems that are relevant to them. They are exploring materials and situations in a variety of play experiences. These materials include objects from around the home and community and in nature.

Children are counting and comparing small groups of objects. They are identifying numbers of particular relevance to them in their surroundings. When describing numbers, children use the everyday language that is modelled by others in their environment.

Key indicators

Children:

- demonstrate the ability to rote count
- demonstrate an awareness of one-to-one correspondence
- demonstrate an awareness of auditory, movement and/or visual patterns in their environment
- classify objects according to colour, texture, taste and/or number
- identify and name numbers from 1 to 3
- compare and classify numbers from 1 to 3
- identify familiar numbers in their environment
- demonstrate an understanding of making a group of objects 'more' or 'less'
- solve problems of personal interest
- demonstrate an awareness of the value of money



Ways to help your child in this phase:

Point out and talk about patterns in the environment, such as tiles, bricks, fabric and wallpaper.

Provide your child with a variety of materials for making patterns — for example, pasta of different shapes and sizes, a cut potato and paint, and 'junk' materials like bottle-tops and iceblock sticks.

Talk with your child about the patterns he/she has created — for example, *Tell me about your pattern. What comes next in your pattern?*

Provide opportunities for your child to perform household sorting tasks, such as putting the cutlery away, setting the table, putting the socks into pairs and putting clothes away.

Discuss sorting activities with your child — for example, *Why have you put those two socks together? Is there another sock which is a better match for that one?*

Point out numbers around the house and the neighbourhood — for example, house numbers, the telephone number and television channels.

Involve your child in meaningful counting activities — for example, *How many ice-creams do we need to buy if each person in the car wants one?*

Talk about the mathematical concepts, like size, shape, position and number, which are included in children's storybooks, such as *The Three Bears*, *Rosie's Walk* and *The Very Hungry Caterpillar*.

Talk with your child about paying for items and the coins needed when you go shopping together.

Allow your child to collect items for the shopping trolley — for example, two loaves of bread or a packet of six buns.

Phase C

Beginning Number Study

Children are developing an understanding of number concepts based on numbers to 10, while their counting range extends to larger numbers.

Children compare the size of groups by matching items or by sight if the number is three or less. When counting and matching objects, they demonstrate an understanding of one-to-one correspondence — that is, they are able to physically match and compare objects from two groups (for example, handing one book to each child in a group).

Children are becoming familiar with the standard ways of recording numbers in digits and words. Children demonstrate an understanding of the concept of addition with materials and record their calculations using digits and the addition sign (+) — for example, $6 + 2 = 8$. They are able to recall particular addition facts to 10.

$$\begin{array}{r} +2 \\ 6 \\ \hline 8 \end{array}$$

Key indicators

Children:

- count forwards and backwards
- demonstrate an understanding of one-to-one correspondence
- count rationally
- describe and create auditory, movement and/or visual patterns involving two elements
- compare and classify numbers from zero to 10
- represent numbers from zero to 10
- identify and use ordinal numbers to 'tenth'
- demonstrate an understanding of the concept of addition
- calculate, explain and record addition situations to 10
- recall and explain particular addition facts to 10
- can use a calculator appropriately in these addition situations
- solve problems using a variety of strategies
- demonstrate an understanding of concepts associated with money



Ways to help your child in this phase:

Encourage your child to count items in the environment during outings — for example, *How many cows are in that paddock?* or *Let's count the number of blue cars we pass.*

Provide your child with opportunities to match items in household activities — for example, *Put a cup on each saucer* or *Give each person a spoon.*

Point out and talk about numbers in magazines and books — for example, *Can you read that page number?* *What's the number that comes after that? Let's see if you're right.*

Play board/dice games in which your child is involved in recognising numbers or counting forwards or backwards — for example, Snakes and Ladders, Snap and Concentration.

Talk with your child about taking turns in games or coming places in a race — for example, *You throw the dice first, then I'll go second and John can go third.*

Ask your child to estimate numbers of objects within your child's counting range — for example, *About how many ... do you think there are?*

After estimating, ask your child to count the number of objects — for example, *How many ... were there? Was your guess close to that?*

While shopping, talk with your child about the cost of various items — for example, *Look how much that costs. Is that more or less than the cost of the sugar? Let's see if I have enough money to pay for both things.*

Phase D Early Place Value

Children are developing an understanding of the concept of place value when applied to two-digit numbers — that is, they can explain the relative value of digits in the 'tens' and 'ones' places. They can read, write, compare and classify numbers to 99. Children can also represent these numbers using a variety of materials and count to 100.

Children demonstrate an understanding of the concepts of addition and subtraction when solving problems and working with numbers to 99. They are able to explain addition and subtraction problems using mathematical language. Children can recall the basic addition facts to 18 and apply these facts when adding numbers to 99. Children can also recall particular subtraction facts to 10.

Key indicators

Children:

- count forwards and backwards
- sequence numbers to 100
- describe and create counting patterns to 100
- demonstrate an understanding of place value in two-digit numbers
- compare and classify two-digit numbers
- represent two-digit numbers
- identify and use ordinal numbers
- recall basic addition facts
- calculate, explain and record addition of numbers to 99
- demonstrate an understanding of the subtraction concept of 'take away'
- calculate, explain and record subtraction situations
- recall and explain particular subtraction facts to 10
- can use a calculator appropriately in these addition and subtraction calculations
- solve problems using a variety of strategies
- apply number concepts to situations involving money



Ways to help your child in this phase:

During games like Hide and Seek, ask your child to count to 50 or 100 while the other players hide.

Compare the scores from a variety of sporting events, such as football games and cricket matches — for example, *East's scored 28 and West's scored 24. Which team won? How many points did they win by?*

Invite your child to show and tell you about counting patterns on a calculator.

When you go out, play I Spy, focusing on two-digit numbers on speed signs and road signs displaying distances — for example, *I spy, with my little eye, a number with six tens and zero ones or the number which comes after 79.*

When walking in the neighbourhood, look at the sequences of house numbers on each side of the road and identify the odd and even numbers.

Involve your child in solving practical problems — for example, *There are a dozen eggs in the box and each person in the family wants two for dinner. Do we have enough eggs? or According to my recipe, I need three eggs for my cake. How many eggs will I have left?*

Ask your child to estimate the outcome of calculations — for example, *How many eggs do you think we'll have left?*

After estimating, ask your child to count the number of objects — for example, *How many eggs are left? Was your estimate close to that?*

While shopping, talk to your child about the cost of different purchases, compare these costs, and allow your child to tender money for purchases and to check the change received.

Use two dice when playing board games and ask your child to calculate the total for each throw.