Supporting Mathematics at Home

Ways parents and caregivers can get involved and support Numeracy Development through *Extending Mathematical Understanding*

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The Purpose and Benefit of this Booklet

The purpose of this booklet is to provide parents/grandparents/caregivers with activities and ways to support the numeracy development of their children/grandchildren at Our Lady Star of the Sea, Terrigal.

Parents, along with teachers, have the responsibility and opportunity to nurture children. The task of nurturing and developing a child's confidence and ability in mathematics is often a challenge parents seek help with.

This booklet contains activities and games that can be played at home to develop a child's knowledge, skills and confidence in counting, place value, addition and subtraction, multiplication and division.
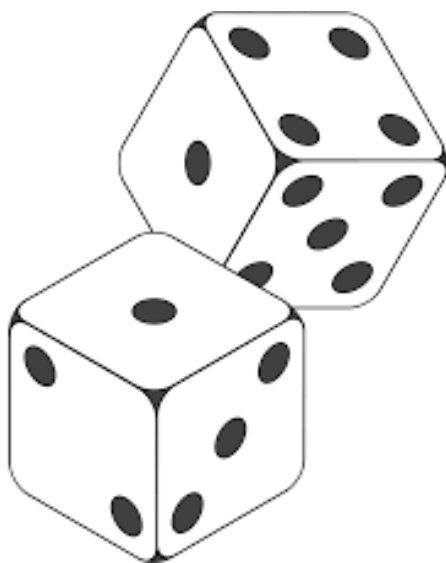
Hard Thinking Questions

By asking questions, your child starts exploring concepts, making connections and articulating what math skills they are trying. By frequently asking these questions, your child will begin a habit of reasoning and explaining their mathematical thinking.

'**Hard thinking' questions** you can ask to encourage mathematical thinking include:

➢ Can you imagine/visualize it?
➢ What helped you work that out?
➢ Can you prove it?
➢ How do you know?
➢ Why is that so?
➢ What is the pattern?
➢ Is there a more efficient way? Is there a quicker way?
➢ Is there a different strategy you can try? Another way?
➢ Did anything trick you?
➢ Was there a mistake that helped you?
➢ What if there were …..more? …..less?
➢ What if there was another group? Double as many? Half that amount?
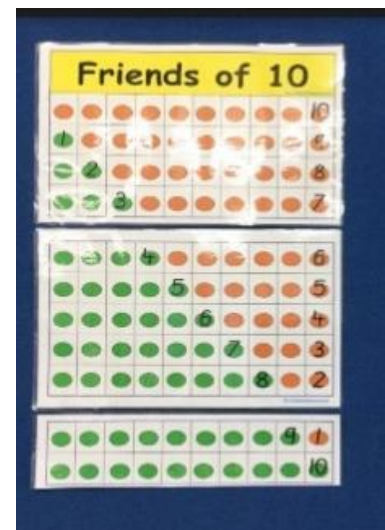
Mathematical Praise/Comments
to encourage a
Growth Mindset in Mathematics

- ➢ You can do this…you're on the right track
- ➢ I can see you're trying… what else might help you solve it?
- ➢ Explain to me what you are thinking
- ➢ Where could you start from?
- ➢ Your persistence is working
- ➢ Math is just like anything else in life - you need effort and hard work
- ➢ Mistakes show me you are trying
- ➢ That's great thinking about those numbers

Using phrases like, 'I was never good at maths,' 'we don't have maths brains in our family, we are better at …' all inhibit learning and imply that you either have a brain to learn maths or you don't.

POINT OUT that everyone has the ability to 'do and learn maths, just like we all can learn to read, write, and ride a bike…'

Counting

The building blocks to mathematics begin with children learning to count – toys, pegs.... One of the first experiences children have with numbers is counting. Counting starts as learning a pattern of words, just like a nursery rhyme/song. As children's counting develops, they begin to relate the words to a number of 'things'.

How do children learn to count and use numbers? Children learn the pattern of counting by repeating the numbers. At the beginning, this pattern may have gaps where your child may invent numbers or leave out numbers.

Remembering the words for each number in the correct order such as '1, 2, and 3' is only part of counting. To count, children need to match saying the number words with the correct number of things i.e., saying the number "three" for three cars. Children should be given lots of opportunities to practise and explore counting groups of things as well as making groups. Children need to recognise and name numbers, with symbols or words.

Counting with your child at home

- Encourage your child to count the number of blocks used to make a tower, pegs used to hang out the washing, cars used on the race track, players in their brother's team, knives and forks at the table...
- Count the number of eggs in a carton, and again after some have been removed. Ask how many are left? How many more to fill?
- Estimate numbers before counting… I think you will need 16 pegs
- Read and talk about stories and rhymes that use numbers.
- Have your child count as far as they are able to go and then encourage them to join you while you continue counting.
- Count forwards and backwards
- Ask what would be one more….one less?
- Later count in twos, fives, and tens. Ask what would be 2more/less, 5more/less, 10 more/less

Handfuls

What's the Mathematics?

• Estimation, counting accurately and efficiently

• Subitising – recognising dot/quantity without having to count 1 by 1

• Number conservation – total is the same regardless of arrangement

You will need: Counters (or another counting object),
How to play:

1. Players take (or are given) a 'handful' of counters.
2. They estimate (a good guess, not supposed to be perfect) how many they think are in their hands or on the table.
3. They arrange their counters so they can count (easily)
4. An adult might ask: "How many do you have?" "What is one more?" "What is one less?" "Who has the most?" "Who has the least?" Can they be arranged in a different way, too?
5. What can you see? (Aim for different arrangements you can see….. I have 2 tens and 4 ones, I have 4 groups of 6, I can see 10+10+4)
6. Write your number on paper/a calculator
7. Find your number on a tape measure/number line/ hundred and twenty charts

Adapting the Game:

• Give a value to a counter. For example, a counter can be worth 2, 5, 10, 25, 50, 100, 3, 0.5, 2.5 etc.

Golden Beans

What's the Mathematics?

• Counting
Number conservation – total is the same regardless of arrangement

• Knowing that the last number spoken when counting is the 'cardinal number' (quantity) of the group / total

You will need:

Golden beans (or anything about that size that have a variety of colours), plastic cups, ten frames (optional)

How to play:

1. Each student is given a small collection of beans, counters (or other small object such as marbles) in a cup. Student shakes the beans and tips some out.

2. How many golden beans can you see? How many (white) beans? How many altogether?

3. Each player answers these questions and then take it in turns to ask another player "How do you know?", "What is one (five/ten/100 etc.) more?", "What is one (five/ten/100 etc.) less?", "Who has the most beans?"
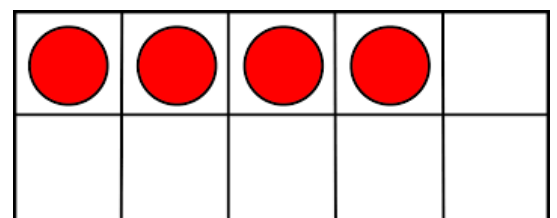
Adapting the Game:

• Players arrange the beans on to the tens frame and discuss the way they have arranged them
• Place the numbers on a number line
• Order collections in order from smallest to largest

Race to 20

What's the Mathematics?
• Counting total of 20 in different ways.
• Place value
• Building to 10 – 'Friends of 10'
• "Ten and four more is fourteen"

You will need:
2-4 players, 20 counters each,
2 ten frames each (OR CAN USE A BEAD STRING)
1 dice (1-6)

How to play:
1. The aim of the game is to 'race to 20'.
2. Each player has 2 ten frames and twenty counters.
3. Players take it in turns to roll the dice.
4. On a player's roll, take that number of counters and place them on the tens frame (OR slide that many beads on a bead string, peg on a number line)
5. An adult would ask something such as "How many do you have?" "How do you know? Can you prove it?" "How many more do you need to race to 20?"
6. The winner is the first player with 20. (You must roll the exact number to get to 20 to win – for example if you have 17 and need 3 more but you roll a 4…….too many! You need to roll a 3, 2, or 1)

Adapting the Game:
• Race to 10 • Race to 50 • Race to 100

BINGO 5

What's the Mathematics?
- Skip counting
- Recognition of 5 more/less
- Reading and writing numbers

You will need:
2-4 players, calculator, cards, 2 dice, paper and pencil, counters

How to play:
1. Players choose and write five 2 digit numbers each. (Can select a different number to write for your bingo card)
2. Caller- uses calculator or rolls 2 dice or draws 2 cards to make and announce a 2 digit number
3. Other players see if they have 5 more or 5 less than this number. If they do, they place a counter on the number (or cross it out)
4. Keep playing until someone gets 3 numbers that are 5 more or 5 less than the caller's number and they call out bingo.

Adapting the Game:
- Play 2 more /2 less or 10 more/10 less

Skip counting

- Forwards by ones, twos, threes, fives, tens
- Backwards by ones, twos, threes, fives, tens

First 0-3, then build up skills so they can skip count 0-120 or more. Ask questions like: What's 5 more than 35? What's 2 less than 98?

- Counting off the decade by a number. For example, 7,11,15,19   or…. 20,23,26,29

Counting collections of money.

- Estimating
- Working out change
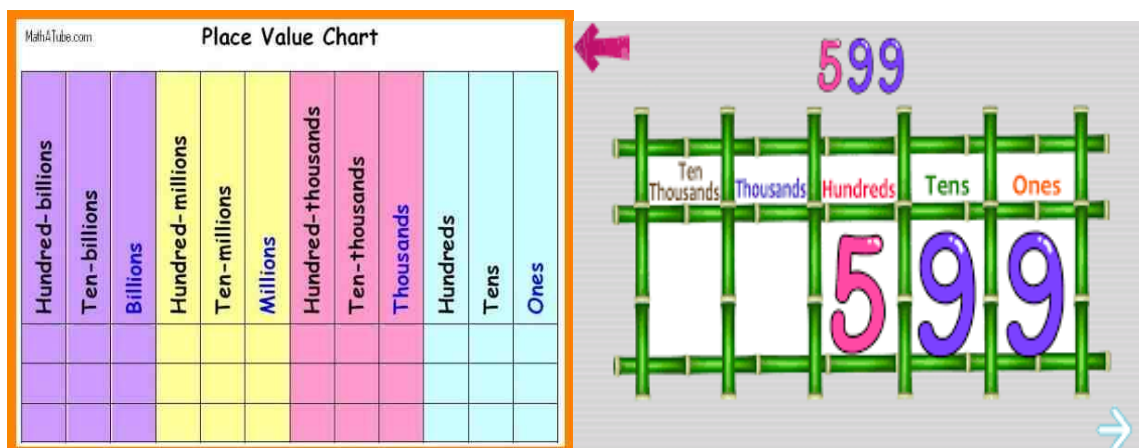- Shopping with real money and change
- Rounding

Place Value

Our decimal number system is based on multiples of 10. It is a Base 10 system. We teach children to recognise the value, or place value, of numbers using this system. We can use a simple place value chart to start this understanding.

Each column to the left is 10 times bigger (more value) than the one before. Children may use paddle pop sticks bundled, wooden blocks to see the values.

Later they are able to split the numbers into their value as:

125 = 1 hundred + 2 tens + 5 ones = 100 + 20 + 5

Hundreds	Tens	Ones

3-in-a-Row Bingo

What's the Mathematics?

• Ordering numbers

• Difference between numbers

You will need:

2 or more players, a measuring tape or empty number line, a dice or digit cards, paper clips

How to play:

1. The winner is the player who places the 3rd number in a row on a number line.
2. Player 1 rolls the dice twice and creates a number (a roll of 2 and 7 makes the number 27 or 72).
3. Once deciding on a number, the player marks the spot on a number line with a texta or if using the measuring tape, a paper clip.
4. Player 2 then has a turn.
5. As soon as a player makes 3 numbers in a row (using any marker, not just the numbers they have made themselves), that student wins.

Adapting the Game:

• Use an empty number line.

• Roll three times and the numbers can be from 0-999

• Roll twice but make the numbers all in a particular hundreds.

• Use a 1-6 dice and a 0-9 dice, and make decimal numbers from 1-6 e.g. 2.7, 6.8

Fill in the Blanks

36		45			86	

You will need: Playing cards (ace-9), a blank row of squares (at least 7, up to 30, with some of the spots filled in with numbers)

How to play:
The student to finish the number sequence correctly is the winner. Players turn over 2 cards and use those to make a number (4 and 2 makes 42 or 24). Players take turns to put a number in. If they are not able to go, the next person takes two cards

What's the Maths?
- Counting
- Ordering numbers
- Difference between numbers

Change the game slightly:
- Use a dice (0-9) instead
- Choose three cards and make the numbers in the hundreds
- Choose four cards and make the numbers in the thousands
- Choose one card and make numbers less than 10
- Biggest to smallest
- Decimals

Addition and Subtraction

SIMPLE DICE GAMES

- Roll or spin to build two 2digit numbers e.g. 34 and 67. Add together or subtract the smallest from the biggest. Ask what's the difference between the two numbers?
- Roll 3 or more die together and add the numbers. Check on a calculator

Tug-of-War

What's the Mathematics? • Visualising numbers – counting beads in groups other than one by one • Counting on – "How many more do you need?" • Partitioning numbers – looking at ways numbers can be structured and recognising 20 can be made up of many different combinations • Facts to ten
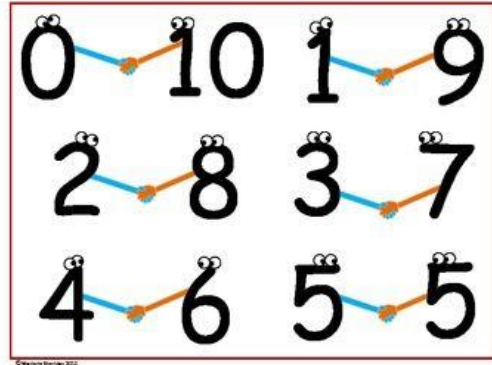
You will need:
2 players, one bead string, one dice (1-6)
How to play:
1. Split the beads in half – 10 each side.
2. The first player rolls the dice and takes that number of beads from their partner. After moving the beads, they say (without counting) how many beads they have.
3. Their partner then says how many they have left. (or player who rolled can say how many they have and how many they need)

4. Take turns rolling the dice and taking beads from each other's total.
5. The winner is the person with 20 beads.

Friends-of-Ten Snap

What's the Mathematics?

• Building to 10 – 'Friends of 10'

You will need:

Playing cards (ace-9), 2-3 players

How to play:

1. The aim of the game is to win the most/all of the cards. Shuffle the cards ace-9 and distribute them equally amongst players, leaving none left over. There are two piles created next to each other, one of the red cards and one of the black cards.
2. Players take it in turns to place a card on a pile (depending on the colour).
3. When the cards on top of each pile together make 10, player 'snaps' and takes all of the cards.
4. The game continues until there is a winner.

Adapting the Game:

• Play friends of 5 snap instead and just use cards ace-4 (possibly using 2 or 3 decks together so the game is not too short)

• Distribute 3-4 cards and closest to 20, using friends of ten.

Number Fun

What's the Mathematics? • Reading numbers • Adding (subtracting) numbers

You will need:
Playing cards (ace-9), calculator, 2 or more players.

How to play:
1. Student 1 randomly chooses 3 cards, creating the largest number possible, e.g. 862.
2. The student reads and writes the number.
3. Student 2 does the same.
4. Student 1 repeats the process, this time adding their first number (862) to their second number (e.g. 653).
5. They record their answer (1515), reading and writing it. Student 2 repeats the process.
6. Both players continue the game until each have had x number of turns (e.g. 6).
7. The student with the highest points wins.
8. How to earn points: 1 point for reading the number correctly, 1 point for writing the number correctly, 2 points for adding the number correctly, 5 points for the highest score after x number of turns.

Adapting the Game:
• You can play the game by using 1 card only, 2 cards, 3 cards (as above), 4 cards, 5 cards, 6 cards or more

• Start at a given number (e.g. 9 566) and using a similar process of selecting, reading and writing numbers but this time subtracting them

Guess how many Beads I moved?

What's the Mathematics? • Counting • Addition and subtraction, friends of ten
* Difference between numbers

You will need:
Bead string, dice, whiteboard or paper, partner/group

How to play:

1. Start at 50
2. Roll 2 dice and add that many without anyone seeing
3. Tell partner your new number
4. They must guess how many beads you've moved on. If correct they get those points
5. Repeat
6. First to 100 wins

Adapting the Game:

- Start at different numbers
- Go to a higher or lower winning number
- Play in reverse and subtract from 50 (or another number)and first to zero wins

BEAD STRING SUBTRACTION

Use a bead string and a dice.

1. Child starts at a given number e.g. 30 and slides to the left that many beads.

2. Rolls dice and must predict how many they will have left, before taking away that many. (I rolled 6, so I think I'll have 23 beads left).
3. They then check if correct. (It was 24, because 6 and 4 are friends of ten, I was 1 off)

Multiplication and Division

Race the Clock

What's the Mathematics? • Counting • Total correspondence • Number conservation – total is the same regardless of arrangement

You will need:
A timer, a dice, different counting materials
How to play:
1. Roll the dice and start the timer.
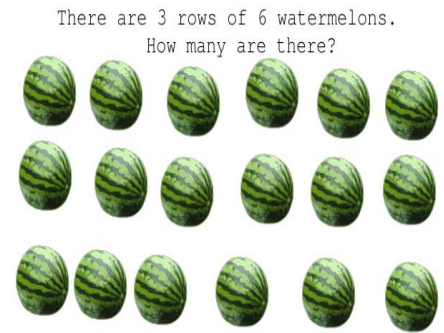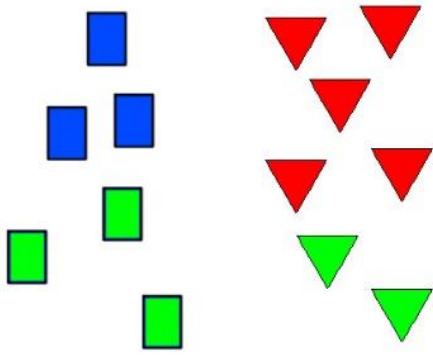2. Make as many groups of this size as possible before the timer goes!

An adult may ask: "How many collections did we make?"
"Are all the collections the same size?"
"How many 'things' do we have altogether?"

Adapting the Game:
- Use a different dice or 2 die
- Make the time shorter or longer
- Make 'things' worth more than 1

There are 3 rows of 6 watermelons.
How many are there?

Rows and Columns - Arrays

What's the Mathematics? • Visualising more and less • Groups * Multiplication and division facts * Equality

You will need:
Objects to arrange/count, dice (1-6 easier, 0-9 harder. If you roll a 0 you will have to roll again as it won't work).

How to play:
1. The aim of the game it to beat the other student by getting the most counters in an array.
2. Each student rolls the dice once and places that many counters in a row in front of them.
3. They then each roll a second time and make sure that each column has that many items in it.
4. Without counting 1, 2, 3 etc., players work out how many counters they have.

An adult may ask: Who has the most? By how many? How many more would the other person need to win? How many if there was one more/ less row? How many if there was one more/ less column? Could the items be grouped in another way with none left over? Is there a smaller array in your array? Is there anything interesting about your number? Could you write/say a problem for this array?

Adapting the Game

- Roll 2 die- one for number of rows, other for number of columns e.g. 4 x 7
- Start with the number (hint, it needs to be the answer to a multiplication) and make an array to show a possible solution.

# Headache (like Celebrity Heads)

What's the Mathematics?

- Multiplication and division facts
- Skip counting

You will need:

Cards, 3 or more players

How to play:

1. Collect all the numbered cards out the card pack.
2. 2 players stand facing the other players.
3. A numbered card is placed on their forehead eg.a 2 and the other person a 5. Players cannot look at their cards.
4. Audience looks at the cards and states the product eg 10, because 2 X 5=10
5. Players turn and look at their opponent's card.
6. The winner is the first to state what number they have on their forehead.
7. Winner stays in and new player faces them.
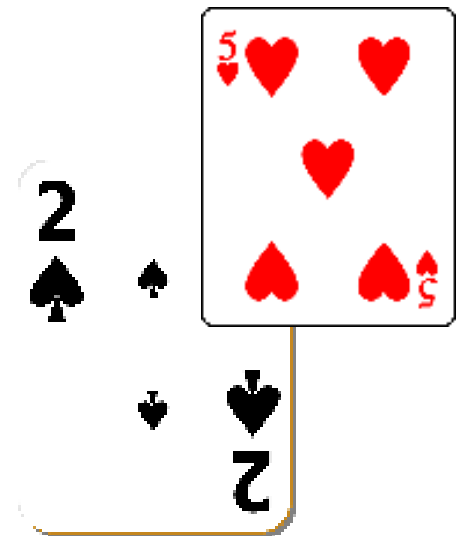
Adapting the Game

- Change to an addition game and audience players state the sum of the cards.
- Play with three cards/players guessing.

Secret Number:
 Think of a number. Players try to guess the number by asking questions such as: "Is it more than….? Is it less than…? Is it an even number? Is it an odd number? " Or give clues- it has a factor of… it is more than double 8…… it has three digits and is divisible by 2…

Snakes and Ladders: Players predict where they will land before moving their playing piece. Adaptation: double the roll before moving.

Story Telling- Roll two numbers or draw cards. Create a number story. Choose if you want addition or subtraction or multiplication or division or keep it free choice.
 For Example: Roll a 3 and a 6
 Story:

- Mum has 3 bags and there are 6 presents in each bag….how many altogether?
- Sally has 3 lilies and Harry has 6 lilies. How many altogether?
- Charlie had 6 Pokémon cards but lost 3, how many has he now?
- Mrs. G had 6 pencils and shared them between 2 kids, how many did they get each?
- Mum had 6 cakes however dad had made three times as many, how many did he have?

Puzzles- to look at spatial awareness, shape, number, counting, more/less, pattern.

Useful Websites

www.schoolatoz.com.au

www.youcubed.org

www.studyladder.com.au

www.matific.com/au/en-au

Useful Apps

Pieces Basic - Place Value and Number
Number Frames
Number Line

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