

A GUIDE FOR PARENTS

HELPING YOUR CHILDREN WITH MATHEMATICS



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The suggestions below have been prepared by staff at the Australian Catholic University as a guide for parents in helping their children in mathematics.

- **Building on success is important.** Create the impression that being successful in mathematics is desirable. Reward effort and try not to criticise errors.
- **People learn, not so much by being told things, as by working things out for themselves** and linking new ideas to ideas that they already have. You can help by asking children questions, letting them work out answers for themselves, and then discussing their answers with them.
- **Children need time to think and time to answer.** When asking your children questions or talking to them about mathematics give them time. Be patient. Wait for them to answer. Also, explain to older children that they need to give younger children time to answer questions, rather than always answering for them.
- **Encourage children to talk.** Talking about mathematics is an effective way of learning and the family is one of the best places to talk, especially when the mathematical situation arises naturally.
- **Use mathematical words when you describe things.** For example, instead of saying “the big red bucket,” you might say “the 10 litre bucket”. Instead of saying “the large packet of rice,” you might say “the 2 kg packet of rice”. In this way, children get to hear quantities being stated as an everyday way of describing things.
- **Buy children's books with mathematical themes.** Some examples are:
Allen, P. *A Lion in the Night* Nelson publishers
Allen, P. *Mr Archimedes' Bath* Collins publishers
Anno, M. *Anno's Counting Book* The Bodley Head
Anno, M. *Anno's Maths Games* Fukuinkan Shoten Publishers Inc
Anno, M. *Anno's Mysterious Multiplying Jar* The Bodley Head
Carle, E. *The Very Hungry Caterpillar* Collins Publishers
Clement, R. *Counting on Frank* Harper Collins Publishers
Hutchins, P. *Clocks and More Clocks* Puffin Books
Hutchins, P. *The Doorbell Rang* Puffin Books
Nesbit, E. & Lynch, P.J. *Melisande* Walker Books
Read these with your children and ask them questions about the stories.
- **There is no hurry.** Children develop their mathematical skills gradually and there is no urgency about developing any particular skill. On the other hand, neither can all of the skills wait until the end of

their schooling. It is necessary to work progressively on helping them to learn mathematics. In other words, start now, but there is no particular need to accelerate your child's development.

- **Help your child's teacher.** Your child's teacher is vitally interested in your child's mathematical development. Talk to the teacher about how your child is going in mathematics and find out whether there are any ways you can help your child. Supporting teachers if they recommend any homework or home-based activities is highly desirable.

Some suggested activities

The following are some activities that you can do with your children. Some are general and some relate to specific aspects of the mathematics curriculum.

Estimating

Estimating is an important activity and applies to all aspects of mathematics. Whenever possible, ask your children to guess quantities. Some examples of estimating tasks that you might ask the children to do are:

- estimate number of jellybeans in a jar
- estimate how many people are in a room
- estimate how many pieces of bread are in a loaf
- estimate the biggest house number in the street that you have just turned into
- estimate how long it will take you to walk to a particular point
- estimate how many steps there are from the bottom to the top when you're walking up some stairs

On some occasions, work together to find the actual amount, distance etc.

Remembering

It is helpful for children to practise remembering numbers and other information. Examples of the type of information which we commonly try to remember are:

- telephone numbers: when children are young you might ask them to repeat back to you two or three numbers in a row; as they get older they should be able to repeat that the longer strings, and even to remember some numbers such as their own phone number and those of their grandparents
- addresses: help the children to learn their own addresses and others such as their grandparents'
- car registration numbers

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- birthdays: children can learn the birth dates of relatives and friends
- time to special events (e.g. How long till Christmas?)

Length

We often compare objects and distances by length and height. Children first do this without using units, then using informal units (like paces). Then they learn about metres, centimetres and kilometres.

- Also: when you are measuring with sewing or building materials, ask the children to estimate where a particular mark would be
- Put up a height measure of the children marked in centimetres on which children can record their height at progressive intervals. Children like to see how much they have grown.

Weight

Children learn first to compare things by hand, and by using balances. Later they learn about kilograms, and grams. You can:

- talk to children about different ways of weighing things
- talk about containers in terms of how much they weigh
- compare the size and weight of items in the supermarket
- weigh ingredients when you are cooking (learning to cook is helpful in many ways).

Capacity

Children learn to compare containers by their capacities. Sometimes children think that a tall skinny glass holds more than a short fat one. Playing with containers and water helps. Children can use water or rice to compare the capacity of containers. They also learn about litres, then about millilitres. You can:

- talk about the size of the containers of items such as washing detergent bottles and medicine glasses
- describe objects in terms of their capacity such as the 375 mL bottle of Coke, or the 5 mL spoon

Time

It is important that children can read both analogue (clock face) and digital time. It is useful to get them to learn to do particular tasks, such as:

- asking the children, "What is today's date?"
- keeping track of family birthdays and knowing which ones are coming up soon
- examining use-by-dates on items and comparing the dates with today's date
- reading timetables: for example, ask, "Which train would we need to catch to get to the football by one o'clock?"
- asking time calculations like, "How long is it from now until... bedtime?" "How long till your next birthday?"

Money

For obvious reasons, children can learn about money at home. This can include:

- calculating money amounts in different ways with coins and notes to present particular amounts – e.g. "Show me \$2.50", "How much do I have in my hand?"
- keeping track of money – e.g. using a calculator and going around the supermarket to keep track of the cost of purchases
- calculating which of two different sized items is the better buy
- giving change, particularly change from \$1 or \$10, and asking how much change they would expect to get

Directions

Parents have a variety of opportunities to help children learn about directions. You might like to:

- describe how to do various household tasks – e.g. setting the table: give instructions like, "Put the fork on the left-hand side, the knife and soup spoon on the right-hand side and the soup spoon on the right-hand side of the knife."
- use north, south, east and west to give directions rather than simply pointing
- let them use a street directory when travelling in the car to locate your destination and then direct you
- let the children take some responsibility for interpreting maps, such as maps of the school, maps of the suburb or maps of the city

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Shape

Children can learn about shape names by hearing them used in everyday speech. You can also:

- use shape names to describe objects, such as the square table, or the rectangular vegetable garden
- get them to sort the cutlery drawer
- have them to help tidy items in the tool shed

Learning to count

Learning to count is important. Counting 1,2,3,4, ... is the main way. We can also count using patterns:

2, 4, 6, 8.... 5, 10, 15, 20...

100, 99, 98, 97... 100, 90, 80, 70....

0.5, 1, 1.5, 2... a, b, c, d...

Monday, Tuesday, Wednesday,...

January, February, March,...

Nursery rhymes help. 'Five Little Ducks', '1, 2, 3, 4, 5, once I caught a fish alive', and '10 Green Bottles' are just a few examples of the nursery rhymes you can say together.

Number facts

Knowing number facts is very useful for the future mathematical studies of your children. You can help by taking an interest and by giving them practice. There are a number of important elements about learning tables and number facts.

First, is that all number facts come in families. If the children know, for example, that $5+2 = 7$ is the same as $2+5 = 7$, and relates to $7-2 = 5$ and $7-5 = 2$, they know a family of facts. The same is true for multiplication. If they know that $5 \times 4 = 20$, they also know $4 \times 5 = 20$, $20 \div 5 = 4$ and $20 \div 4 = 5$.

Next, they need to learn general principles such as adding 1, adding 2, doubles, near doubles ($5+6$ is the same as $5+5+1$), adding 10, adding 9 (by adding 10 and taking away 1). For multiplication, they can learn about doubling ($\times 2$), followed by multiplication by 10, 5, 11, 3, 4 then the rest.

Number games

There are many games that incorporate mathematical skills that families can play. One card game commonly available now is called *Numero* which can be purchased

in games shops and newsagents. These provide practice of mental arithmetic. There are also more traditional

games such as *Cribbage* and *Pontoon* which provide practice in addition.

When playing games that involve logical thinking, talk with the children about better moves, or plays which lead to winning. Think together about ways to avoid losing as well as ways to win. Verbalising strategies is important for logical thinking.

Other games include:

Car number plates

When your car pulls up behind the car in front of you, you might have a competition to see how many different answers children can make using the numbers from the car number plate. For example, if the numberplate is 152 the children might say $1 \times 5 + 2$ is 7, or $1 + 5 + 2$ is 8, or $(1+5) \times 2$ is 12 and so on.

Another idea is to add the digits like this: 157 becomes $1+5+7$ which is 13, then $1+3 = 4$ and to see which number plate will give a particular target number.

Guess the pattern

One player thinks of a rule (such as double and add 1). Other players can suggest a number (such as 5) and the first player tells them the number which results from the pattern (11). The players can keep testing numbers until they work out the rule.

Guess my number

One player thinks of a number, say between 1 and 100. The other player asks questions using only the words 'more' or 'less'. For example, a player might ask, 'Is the number more than 52?' The first player must answer either yes or no.

Race to 10

This game has two players. Starting at 0 they take turns and can add either 1 or 2 to the last number said. The player who says 10 is the winner. For example, suppose:

A says B says

1 3

4 6

7 8

10 so A wins.

Note that the game has a winning strategy. This game is flexible. You can play race to 21, counting by numbers from 1 to 3, or race to 50 using 1 to 6.