Mathematics

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Mathematics is a body of knowledge that has been created by humans and which is constantly being refined and increased by ongoing enquiry. It is also a basis for scientific study and an essential tool for everyday life. It has contributed to and is reflected in all cultures of the world. The Cook Island Mathematics Curriculum document divides Mathematics knowledge and learning into five strands but there are areas where these overlap and this should be reflected in the teaching programme. Download: Curriculum MathsStrickland Upu Maths Advisor/Numeracy Facilitator

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Numeracy is the foundation skill of Mathematics and all students need to be numerate in order to function effectively at school, at home and in the community. The document provides a strong link to the strategy and knowledge frameworks of the Numeracy Project which is being introduced into the Cook Islands.

The ability to compute accurately is no longer sufficient in education or the workplace, therefore problem-solving skills must be developed in order for students to become successful. Educators have a responsibility to prepare students to meet the challenges of the future which cannot always be anticipated or specifically prepared for. Developing a wide range of problem-solving skills and the ability to determine which to use prepares students for complex situations.

Students should be competent and comfortable with the language of Mathematics. Literacy is the other major focus of education and one aspect of this is Mathematical literacy. They should also learn to use the symbols of Mathematics as these will clarify their thinking and ability to communicate Mathematical ideas.”

(from the ‘Cook Islands Mathematics Curriculum – Kura Apii Matematika o te Kuki Airani’)Maths Quiz

Were you at the Maths Quiz 2006 ? If not here is your chance to see how you would have gone with the questions. Good luck !

{mospagebreak title=The Numeracy Project} Introduction The Numeracy Project being implemented in our schools is the New Zealand Numeracy Professional Development Project focused on improving student performance in mathematics through improving the professional capability of teachers. The numeracy project aims to help children improve their thinking skills from the start of school at the primary school level until the end at secondary level.The project encourages teachers to identify children’s strategies or processing abilities and it also encourages teachers to find where blocks to thinking are caused by lack of instant recall of basic knowledge. They then seek to improve students’ thinking skills and to automatise the knowledge on which thinking rests.For further information regarding the numeracy project please contact Strickland Upu at: supu@education.gov.ckwww.nzmaths.co.nz/numeracy/index.aspx or go online to What is the Numeracy Project?

The Numeracy Project is a New Zealand wide professional development initiative which introduces teachers to a new approach to the teaching of mathematics. The Ministry of Education after some consultation and advice is implementing this numeracy project here in the Cook Islands. The Numeracy Project is focused on developing children's understanding of numbers, and their ability to use numbers to solve problems. Children may solve number problems by counting, adding, subtracting, multiplying, dividing, or combinations of these. As part of the Numeracy Project children should be learning to:

- enjoy working with numbers
- make sense of numbers - how big they are, how they relate to other numbers, and how they behave
- solve mathematical problems - whether real life or imaginary
- calculate in their heads whenever possible, rather than using a calculator or pen and paper o show that they understand maths, using equipment, diagrams and pictures
- explain and record the methods they use to work out problems
- accept challenges and work at levels that stretch them
- work with others and by themselves
- discuss how they tackle mathematical problems - with other students, their teacher and you!

The biggest difference in schools involved in the Numeracy Project is that children are encouraged to learn a range of different ways to solve problems and to choose the most appropriate one for each problem. You may be familiar with certain 'rules' for doing maths. While these will still work, your child may learn different ways to solve problems. Often these methods involve mental strategies, or working things out in your head, rather than written methods.

This change in approach to maths education reflects changes in the world that impact on the maths that people need to

know. Employers are increasingly looking for staff that have problem solving skills and an understanding of concepts, rather than just the ability to follow rules for calculating. The increasing use of technology has also meant that a calculator or computer is almost always available in the workplace for larger calculations.

The Numeracy Project uses a framework, called the Number Framework, to describe children's level of ability and to ensure that the activities they are doing are suitable. For more information about the Number Framework read Book 1 of the numeracy booklets or read on.NUMERACY RESOURCES

- The Data Summary Sheet
- The Grouping Sheets are in Book 3 of the Numeracy Booklets
- The Unit Plans are on the internet.

Go to www.nzmaths.co.nz/numeracy/index.aspx and click on Project Materials. There you are able to get almost everything; The Numeracy Booklets, Material Masters, Planning Sheets, and many more resources.

{mospagebreak title=The Number Framework} What is the Number Framework?

The Number Framework is intended to help teachers, parents and students understand the stages of learning of number knowledge and understanding.

There are two sections to the Number Framework. The Strategy section describes the processes students use to solve problems involving numbers - how they work things out. The Knowledge section describes the key items about number that children know and can recall quickly.

The two sections are linked, with children requiring knowledge to improve their strategies, and using strategies to develop new knowledge.The Strategy Section

The Strategy section of the Number Framework describes a series of stages that children progress through as they develop their understanding of a range of strategies for solving number problems. There are eight stages altogether, with the first three often grouped together:

- Stage 0-3: Counting from One - children can solve problems by counting from one, either using materials or in their head.
- Stage 4: Advanced Counting - children can solve problems by counting in ones, or by skip counting, starting from numbers other than one.
- Stage 5: Early Additive - children can solve simple problems by splitting up and adding together the numbers in their head.
- Stage 6: Advanced Additive - children use a range of different methods to solve more challenging problems in their head.
- Stage 7: Advanced Multiplicative - children use a range of different methods to solve multiplication and division problems in their head.
- Stage 8: Advanced Proportional - children can solve complicated problems involving fractions, decimals and percentages using a combination of methods.

There are three areas, or 'domains' within the Strategy section, which describe a child's ability to solve different types of problems (additive, multiplicative and proportional). Your child is likely to be learning a broad range of strategies in their classroom mathematics programme. One of the ways that you can most easily support them is to help them develop the knowledge that they will need to be able to use these strategies.The Knowledge Section

The Knowledge section is broken down into five areas, referred to as 'domains': Numeral Identification, Number Sequence and Order, Grouping/Place Value, Basic Facts, and Written Recording. This section describes the key items of knowledge that students need to learn. This knowledge plays a critical role in students applying their available strategies with proficiency and fluency across all the numbers and problem types that they may encounter. Refer to Book 1 of the numeracy booklets for more information.

{mospagebreak title=What can parents do?}

What can I do to help my child? Be Supportive

Not everyone loves maths. But everyone uses maths in their everyday life, so it is important for your child's future that they are successful in mathematics. One of the easiest ways to help ensure that this happens is to be supportive of their experiences in maths. Do you spend as long helping your child learn about maths as you do reading? Do you show a positive attitude towards your child's maths homework? You are your child's most important role model and their attitude towards maths is likely to reflect your own.

It is easy to be interested in the books your child is reading, the writing they are doing, and the sports they are playing at school. Try to be equally interested in the maths they are learning.Listen to them

The Numeracy Project aims to encourage children to think about different ways of solving problems, and to be able to explain them to others. If your child is explaining how they answered a question - LISTEN. They may not answer it the same way that you would, but that does not mean they are wrong. Expect your child to use different strategies to solve problems. Encourage them to explain their thinking. Sometimes you might need to use materials, such as counters, or pen and paper for them to demonstrate what they mean. Be prepared to try different strategies yourself!
Give them opportunities to do maths

Maths is everywhere! Regardless of the age or ability of your child there are opportunities for them to practice their maths.
If your child is learning to count - count things. You may count the number of steps in a staircase, the number of toys on the floor, the number of cars driving past, or anything else you can think of. The more your child counts, the better they will get.
If your child is learning to add - add things. This could be easy things such as the number of knives on the table plus the number of forks on the table, or more difficult things such as the cost of items at the supermarket. Don't forget to subtract as well.
Ask your child what they are doing in maths at school and try to use it in everyday life. If they are learning about fractions, ask them about fractions "What fraction of people in our family are children?" "What fraction of the milk is left?". This will not only give them practice, but also show them that maths relates to the 'real' world. Some great contexts for maths are:

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Money - counting and calculating. Pocket money, banking, shopping...

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Measuring things - lengths, areas, volumes, cooking ingredients...

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Travelling - reading numbers on signs for young children, calculating distances and speeds for older children.

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Games - Monopoly, Bingo, board games, cards...

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Time/timetables.