

# Researching Numeracy Teaching Approaches in Primary Schools

## ACTION PLANS

### Description

An action research approach based on the design elements for effective school improvement (Hill and Crévola, 1997) was determined to be the most appropriate means of identifying, describing and indirectly evaluating the notion of numeracy teaching approaches in a range of Victorian primary schools. An action research approach was used as it values teachers' existing knowledge base and engages teachers as co-learners in reflecting upon and refining their practice in a structured and purposeful way. Moreover, action research is judged to be instrumental in bringing about change if there are observable changes in teachers' professional language and practice, a desired outcome of the project.

As part of their commitment to the project, research schools appointed a school-based numeracy coordinator and prepared an action plan aimed at implementing a range of approaches in a structured way. Schools were supported in the action research cycle by a member of the research team and a series of State-wide Action Research Meetings aimed at reviewing progress and informing school-based planning.

### *School Action Plan*

The school-based numeracy coordinators worked with their staff to prepare a *School Action Plan* incorporating the nine design elements of the school improvement model. The primary purpose of the Action Plans was to ensure everyone involved with the project was aware of what was expected of them and what actions and strategies needed to be in place for the implementation and evaluation of numeracy teaching approaches in their school. Schools could decide what actions and/or strategies would help them identify, trial, review and describe numeracy teaching approaches for eight of the design elements. However for the element, 'School and Class Organisation', schools were all expected to implement a numeracy block for at least one hour per day, use a 'whole class – small group – whole class' structure where appropriate, engage with at least one group of students each day to extend/scaffold their mathematics learning, and reflect on their practice. To support coordinators and teachers in this work, a member of the research team was assigned to each research school and visited on a regular basis.

### *School Action Plan Pro forma and Action Plan Model*

To assist with the process of writing their Action Plan, schools were provided with an action plan pro forma and a model of a completed action plan.

### Analysis

The Action Plans were evaluated through the *School Impact Reports* (refer Appendix 14). Some schools also completed a separate evaluation of the strategies and actions outlined in their Action Plan (refer this appendix).

## **Contents**

- Action Plan Pro forma
- Action Plan Model
- Action Plan Example
- Action Plan Evaluation Example

## Researching Numeracy Teaching Approaches in Primary Schools

### ACTION PLAN FOR [insert school name]

Design Elements <small>(from Hill &amp; Grevola, 1997)<sup>1</sup></small>	Strategies/Actions What we agree we will DO to explore numeracy teaching approaches	Evaluation How we will KNOW that we have been successful
<b>1. Beliefs and Understandings</b>		
<b>2. Leadership and Coordination</b>		
<b>3. School and Class Organisation</b>	<p>All teachers of mathematics will plan to</p> <ul style="list-style-type: none"> <li>• implement a Numeracy Block for at least 1 hour per day</li> <li>• use a 'whole class-small group-whole class review' structure wherever possible/appropriate; and</li> <li>• engage with at least one small group per day to extend/scaffold their mathematics learning.</li> </ul> <p>Groups to be selected on the basis of specific learning needs<sup>2</sup>.</p>	<p>Measurable improvements in students' mathematical knowledge and confidence.</p> <p>An expanded and agreed way to talk about numeracy teaching approaches.</p>
<b>4. Class Teaching Program</b>		

5. Standards and Targets		
6. Monitoring and Assessment		
7. Intervention and Special Assistance		
8. Home, School and Community Partnerships		
9. Professional Learning Teams		

**Action Plan Endorsed by:**

School Principal: ..... / ..... /01  
(print name) ..... (signature) (date)

Of: .....[insert school name].....

**And the School-based Numeracy Coordinator(s):**

..... / ..... /01  
(print name) ..... (signature) (date)

..... / ..... /01  
(print name) ..... (signature) (date)

## Researching Numeracy Teaching Approaches in Primary Schools

### ACTION PLAN MODEL

All Research Schools are expected to prepare an Action Plan by the end of October, 2001.

The Action Plan will be used to support the implementation and evaluation of Numeracy Teaching Approaches in the context of the particular school setting. It is not meant to be a lengthy or overly formal document. The primary purpose is to ensure that everyone is aware of what they are expected to do and what actions/strategies need to be in place to support this.

Action Plans should be prepared using the format below and endorsed by the Principal and School-based Numeracy Coordinator(s) in the space provided. An example is provided below to assist in this process.

<b>Design Elements</b> <small>(from Hill &amp; Grevola, 1997)<sup>1</sup></small>	<b>Strategies/Actions</b>	<b>Evaluation</b>
<b>What we agree we will DO to explore numeracy teaching approaches</b>	<b>How we will KNOW that we have been successful</b>	
<b>1. Beliefs and Understandings</b>	Numeracy teaching approaches to be an agenda item at Staff meetings. Teams to take it in turns to share what they are doing/noticing with other staff (approx. 10 minutes). Coordinator to note aspects that need further elaboration/follow-up.	All teachers feel comfortable about exploring and sharing numeracy teaching approaches.
<b>2. Leadership and Coordination</b>	School-based Numeracy coordinator given 1 hour per week to visit classrooms, support teachers. Principal and Deputy to relieve where possible to support team meetings. Relevant resources will be organised and expanded.	Time utilised to satisfaction of staff. Resources better organised and more widely used

<p><b>3. School and Class Organisation</b></p>	<p>All teachers of mathematics will plan to</p> <ul style="list-style-type: none"> <li>• implement a Numeracy Block for at least 1 hour per day</li> <li>• use a 'whole class-small group-whole class review' structure where possible/appropriate; and</li> <li>• engage with at least one small group per day to extend/scaffold their mathematics learning.</li> </ul> <p>Groups to be selected on the basis of specific learning needs<sup>2</sup> and the particular task.</p>	<p>Measurable improvements in students' mathematical knowledge and confidence.</p> <p>An expanded and agreed way to talk about numeracy teaching approaches</p>
<p><b>4. Class Teaching Program</b></p>	<p>Teachers and teams will select mathematics content appropriate to the learning needs of students. They will choose and use a variety of resources including concrete materials, games, problem solving, open-ended tasks and extended discussion. There will be a consistent and uncompromising focus on student learning.</p>	<p>Work plans will include a range of teaching and learning strategies</p> <p>Resources will be better managed and utilised</p>
<p><b>5. Standards and Targets</b></p>	<p>Teachers will ensure that students know what it is they are aiming to achieve in mathematics. There will be an emphasis on recording and discussing 'what we have learnt'.</p>	<p>Students are able to report what they are trying to learn and what they have achieved</p>
<p><b>6. Monitoring and Assessment</b></p>	<p>Teachers will use a variety of assessment and monitoring strategies aimed at identifying exactly what students know and can do in relation to key aspects of mathematics.</p> <p>Teachers will keep accurate records of student learning and note important, significant shifts in individual student's understanding.</p>	<p>Planning based on knowledge of student learning needs. Reports reflect a sound knowledge of individual student learning.</p> <p>Reflections contributed to team meetings.</p>
<p><b>7. Intervention and Special Assistance</b></p>	<p>The specific needs of students requiring special assistance and/or intervention will be closely monitored and used as a basis for planning what teachers DO and SAY in teaching focus groups involving these students</p>	<p>Significant improvement in student knowledge and confidence as a result of targeted teaching</p>

<p><b>8. Home, School and Community Partnerships</b></p>	<p>Parents will be informed of the school's involvement with the project via the newsletter and School Council. Each grade will contribute at least one item for the newsletter that demonstrates the value of numeracy teaching approaches.</p>	<p>On average, there is something related to the project in every second school newsletter. School Council is informed about progress at least twice per year.</p>
<p><b>9. Professional Learning Teams</b></p>	<p>Teachers will discuss the numeracy teaching approaches they intend using in their weekly Year/Curriculum and Standards Framework Level planning meetings. All teachers will meet at least four times per Term (apart from regular Staff meetings) to reflect on their experience of working with numeracy teaching approaches.</p>	<p>Teachers record their experience and are developing and using consistent language to describe numeracy teaching approaches</p>

**Action Plan Endorsed by:**

School Principal: ..... / ..... /01  
(print name) ..... (signature) (date)

Of: ..... (insert school name)

**And the School-based Numeracy Coordinator(s):**

..... / ..... /01  
(print name) ..... (signature) (date)

..... / ..... /01  
(print name) ..... (signature) (date)

**Notes:**

1. Hill, P. & Crevola, C. (1997) *Key features of the whole school design approach to literacy teaching in schools*. The University of Melbourne: Melbourne (summary page included in project folder, 8/10/01).
2. Learning needs could be *common* (that is, students share similar, specific learning needs) or *complementary* (that is, students have different but compatible needs in relation to the particular content being studied). An example of complementary learning needs is where a student, who knows the content but needs to learn how to explain it, might be grouped with other students who are prepared to share their thinking and/or ask questions but need to learn the particular content.

# Researching Numeracy Teaching Approaches in Primary Schools

## ACTION PLAN FOR Example Primary School

<b>Design Elements</b> <small>(from Hill &amp; Crevola, 1997)<sup>1</sup></small>	<b>Strategies/Actions</b> <b>What we agree we will DO to explore numeracy teaching approaches</b>	<b>Evaluation</b> <b>How we will KNOW that we have been successful</b>
<b>1. Beliefs and Understandings</b>	<ul style="list-style-type: none"> <li>▪ To extend and explore the notion that children learn mathematics best when involved in real hands on situations as a professional team of teachers.</li> <li>▪ To develop a common mathematical language for our school.</li> </ul>	<p>Whole school P.D. plan would reflect the emphasis on numeracy. Planning documents, P.D., Budgets, classroom resourcing, etc</p> <p>The common mathematical language will be used throughout the school.</p>
<b>2. Leadership and Coordination</b>	<ul style="list-style-type: none"> <li>▪ In collaboration, the maths committee, curriculum leaders, level co-ordinators and school based numeracy co ordinators to have two meetings each term to review and reflect on the progress of our classroom programs.</li> <li>▪ Provide opportunities for staff to attend Early Numeracy P.D ( school based) &amp; further mathematics P.D as needed.</li> </ul>	<p>Regular timetabled meetings. Keeping of minutes, part of the staff meetings rotations. Curriculum Day allocation over the next three years, Agenda at meetings to include discussions about teaching approaches</p>

<b>3. School and Class Organization</b>	<p>All teachers of mathematics will plan to</p> <ul style="list-style-type: none"> <li>• implement a Numeracy Block for at least 1 hour per day</li> <li>• use a 'whole class-small group-whole class review' structure wherever possible/appropriate; and</li> <li>• engage with at least one small group per day to extend/scaffold their mathematics learning.</li> <li>• Groups to be selected on the basis of specific learning needs<sup>2</sup>.</li> </ul>	<p>Measurable improvements in knowledge and confidence. An expanded and agreed way to talk about numeracy teaching approaches</p>
<b>4. Class Teaching Program</b>	<ul style="list-style-type: none"> <li>• Teachers P-6 to trial the early years numeracy interview with a group of children</li> <li>• Parent helper training to be made available.</li> <li>• Staff in-service on the numeracy interview.</li> <li>• Early Years Numeracy Coordinator to work closely with classroom teachers.</li> <li>• Early years program will be implemented in classroom. ( professional development).</li> <li>• Extend hands on resource tubs to support program.</li> <li>• Use of teacher reflections e.g. ' moments to remember'</li> </ul>	<p>Respond to PNRP staff surveys. Program auditing. Survey on how effective the resources have been. Sharing and reflecting on teaching strategies at level meetings.</p>
<b>5. Standards and Targets</b>	<ul style="list-style-type: none"> <li>• Teachers will ensure that students know what it is they are aiming to achieve in mathematics. There will be an emphasis on recording and discussing what we have learned.</li> </ul>	<p>Students are able to report what they are trying to learn and what they have achieved.</p>
<b>6. Monitoring and Assessment</b>	<ul style="list-style-type: none"> <li>• Children write a goal for mathematics.</li> <li>• Trialling of mathematical journals for students, to record progress.</li> <li>• Developing common assessment tasks.</li> <li>• Moderation of samples of children's work.</li> <li>• A variety of formal and informal assessment tasks.</li> </ul>	<p>Moderation and development of common assessment tasks to be discussed at level meetings. School learning diaries to reflect children's mathematical progress and reporting to parents.</p>

<b>7. Intervention and</b>	<ul style="list-style-type: none"> <li>• Support class teachers during the numeracy program.</li> </ul>	<p>Tracking children at risk in</p>
----------------------------	---	-------------------------------------

<b>Special Assistance</b>	<ul style="list-style-type: none"> <li>• Investigate ways of developing an enrichment program in mathematics.</li> <li>• Maintain the numeracy learning improvement plan throughout the school.</li> </ul>	numeracy over time.
<b>8. Home, School and Community Partnerships</b>	<ul style="list-style-type: none"> <li>• Keeping parents informed about numeracy issues; <ul style="list-style-type: none"> <li>-Information nights</li> <li>-Newsletter items</li> <li>-Parent trainers</li> <li>-Family maths night</li> <li>-Parents invited to assist/ observe</li> <li>-Parents reference library.</li> <li>-Maths Week.</li> </ul> </li> </ul>	<p>Keep a record of trained parents</p> <p>Record of attendance at family maths night.</p> <p>Survey parents</p> <p>Participation in classrooms/ school maths events.</p>
<b>9. Professional Learning Teams</b>	<ul style="list-style-type: none"> <li>• Teachers meeting with the leadership team i.e. maths committee</li> <li>• Annual review will reflect maths strategies</li> <li>• Planning teams.</li> <li>• Interaction with State-wide Action Research Meetings (SWARM) .</li> <li>• colleagues.</li> <li>• Leadership Key Learning Areas (KLA) meetings.</li> </ul>	<p>Minutes,</p> <p>Timelines,</p> <p>Development of units of work.</p>

**Action Plan Endorsed by:**

**School Principal:** ..... / ..... /01  
(print name) (signature) (date)

**Of:** .....[insert school name].....

**And the School-based Numeracy Coordinator(s):**

..... / ..... /01  
(print name) (signature) (date)

..... / ..... /01  
(print name) (signature) (date)

## Researching Numeracy Teaching Approaches in Primary Schools

### ACTION PLAN EVALUATION FOR Name Withheld

Design Elements <small>(from Hill &amp; Crevola, 1997)<sup>1</sup></small>	Strategies/Actions <b>What we agree we will DO to explore numeracy teaching approaches</b>	Evaluation <b>How we will KNOW that we have been successful</b>	Final Evaluation <b>April 2003</b>
<b>1. Beliefs and Understandings</b>	Numeracy teaching approaches to be an agenda item at Level meetings and teams to report back at Staff Meetings. Each team will report at least once a term. Monday night Professional Development once a term. Coordinator to note aspects that need further elaboration/follow up.	All teachers feel comfortable about exploring and sharing numeracy teaching approaches.	Numeracy teaching approaches have been a regular item at both Level meetings and staff meetings since the beginning of the project. Staff talk about maths teaching confidently. Numeracy planning reflects this.
<b>2. Leadership and Coordination</b>	School based Numeracy coordinator given 1 hour per week to visit classrooms, support teachers. Curriculum coordinator to relieve where possible to support team meetings. Focus ideas for discussion at Level Meetings will be formulated by the Numeracy Coordinator. Numeracy Coordinator will be supported by Early Numeracy Coordinator and Maths Task Centre Manager.	Coordinator is able to communicate with all staff and ensure that the implementation and evaluation of the project is ongoing.	Both the Numeracy Coordinator and the Early Numeracy Coordinator have been active in promoting numeracy throughout the school in many ways, from delivering staff meeting agenda items to running PD sessions. They will play a key role in developing a Numeracy Handbook.

<p><b>3. School and Class Organisation</b></p>	<p>All teachers of mathematics will plan to</p> <ul style="list-style-type: none"> <li>implement a Numeracy Block for at least 1 hour per day</li> <li>use a 'whole class-small group-whole class review' structure wherever possible/appropriate; and</li> <li>engage with at least one small group per day to extend/scaffold their mathematics learning.</li> </ul> <p>Groups to be selected on the basis of specific learning needs<sup>2</sup>.</p>	<p>Measurable improvements in students' mathematical knowledge and confidence. An expanded and agreed way to talk about numeracy teaching approaches</p>	<p>This is happening at all levels. The numeracy block is an important feature of the timetable. Teachers plan for this in teams and implement the whole-small-whole approach. Teachers work with either one or two small teaching groups per day, using scaffolding approaches that have been the focus of PNRP.</p>
<p><b>4. Class Teaching Program</b></p>	<p>Teachers and teams will select mathematics content appropriate to the learning needs of students using the Maths Course Advice and CSF 11. They will choose and use a variety of resources including concrete materials, games, problem solving, open-ended tasks, computer applications and extended discussion.</p>	<p>Planning will include a range of teaching and learning strategies. Resources will be better managed and utilized.</p>	<p>Planning has strengthened as a result of the implementation of the current numeracy block format. Maths tubs and Course Advice documents in each classroom have provided a rich bank of resources to support the teaching and learning.</p>
<p><b>5. Standards and Targets</b></p>	<p>Teachers will ensure that students know what it is they are aiming to achieve in mathematics. There will be an emphasis on recording and discussing 'what we have learnt.'</p>	<p>Students are able to report what they are trying to learn and what they have achieved.</p>	<p>This is improving, but can be developed further. In many classrooms, students are now regularly recording how they approached and solved problems.</p>

<p><b>6. Monitoring and Assessment</b></p>	<p>Teachers will use a variety of assessment and monitoring strategies aimed at identifying exactly what students know and can do in relation to key aspects of mathematics. Teachers will keep accurate records of student learning and note important, significant shifts in individual student's understandings.</p>	<p>Planning based on knowledge of student learning needs, reports reflect a sound knowledge of individual student learning. Reflections contributed to team meetings.</p>	<p>Contact with Cath Pearn resulted in the acquisition of a range of P-6 assessment tools, including observations, interviews and screening tests. We have implemented a testing schedule at all levels and will now be able to track student progress through the years.</p>
<p><b>7. Intervention and Special Assistance</b></p>	<p>The specific needs of students requiring special assistance and /or intervention will be closely monitored and used as a basis for planning what teachers DO and SAY in teaching focus groups involving these students. Students may be placed in Maths Support or Enrichment programs according to need and closely monitored by the ISP committee.</p>	<p>Significant improvement in student knowledge and confidence as a result of targeted teaching.</p>	<p>The appointment of a maths support teacher has strengthened the assistance given to children needing support. Students are identified for this program via the P-6 testing schedule and the ISP committee.</p>
<p><b>8. Home, School and Community Partnerships</b></p>	<p>Parents will be informed of the school's involvement with the project via the newsletter.</p>	<p>Regular reports in the newsletter. Presentations at School Assembly and Maths display in the school foyer and an annual Maths Evening.</p>	<p>This can be improved. Some communication has occurred through the newsletter. Information evenings at the beginning of the year detail the approaches to teaching numeracy. The annual maths evening is a display of Talent Quest entries.</p>
<p><b>9. Professional Learning Teams</b></p>	<p>Teachers will discuss the numeracy teaching approaches they intend using in their Year/CSF Level planning meetings. All teachers will meet on a regular basis to reflect on their experience of working with numeracy teaching approaches.</p>	<p>Teachers record their experience and are developing and using consistent language to describe numeracy teaching approaches.</p>	<p>Teachers initially kept journals to record their experiences. They no longer do this, but do plan together and also regularly discuss maths teaching approaches in level meetings.</p>

