

2 ACKNOWLEDGEMENTS

The Project directors acknowledge the vital support and contributions of many people to this report, including:

- the very dedicated staff of the Educational Assessment Research Unit
- Dr David Philips and other staff members of the Ministry of Education
- members of the Project's National Advisory Committee
- members of the Project's Mathematics Advisory Panel
- principals and children of the schools where tasks were trialled
- principals, staff, and Board of Trustee members of the 286 schools included in the 2001 sample
- the 3153 children who participated in the assessments and their parents
- the 108 teachers who administered the assessments to the children
- the 44 senior tertiary students who assisted with the marking process
- the 166 teachers who assisted with the marking of tasks early in 2002

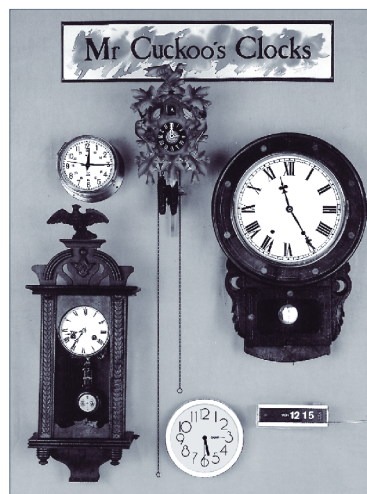
New Zealand's National Education Monitoring Project commenced in 1993, with the task of assessing and reporting on the achievement of New Zealand primary school children in all areas of the school curriculum. Children are assessed at two class levels: Year 4 (halfway through primary education) and Year 8 (at the end of primary education). Different curriculum areas and skills are assessed each year, over a four year cycle. The main goal of national monitoring is to provide detailed information about what children can do so that patterns of performance can be recognised, successes celebrated, and desirable changes to educational practices and resources identified and implemented.

Each year, small random samples of children are selected nationally, then assessed in their own schools by teachers specially seconded and trained for this work. Task instructions are given orally by teachers, through video presentations, on laptop computers, or in writing. Many of the assessment tasks involve the children in the use of equipment and supplies. Their responses are presented orally, by demonstration, in writing, in computer files, or through submission of



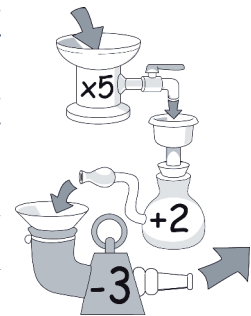
CHAPTER 2

Chapter 2 explains the place of mathematics in the New Zealand curriculum and presents the mathematics framework. It identifies five areas of knowledge or curriculum strands (number, measurement, geometry, algebra, and statistics), linked to five major processes and skills. The importance of attitudes and motivation is also highlighted. The assessment results are arranged in chapters according to the strands in the curriculum, but with algebra and statistics in one chapter because of small numbers and also space constraints in this report.



CHAPTER 3

Chapter 3 presents the students' results on 35 number tasks. Averaged across 229 task components administered to both year 4 and year 8 students, 25 percent more year 8 than year 4 students succeeded with these components. Year 8 students performed better on every component. As expected,



the differences were generally larger on more difficult tasks. These often were tasks that many year 4 students would not yet have had much opportunity to learn in school.

There was evidence of modest improvement between 1997 and 2001, especially for year 4 students. Averaged across 59 trend task components attempted by year 4 students in both years, 5 percent more students succeeded in 2001 than in 1997. Gains occurred on 51 of the 59 components. At year 8 level, with 106 trend task components included, 3 percent more students succeeded in 2001 than in 1997. Gains occurred on 85 of the 106 components.

Students at both levels scored poorly in tasks involving estimation and tasks involving fractions (especially fractions other than halves and quarters). Asked to work on computations such as $36 + 29$ or 9×98 , few students at both levels chose the simplification of adjusting one of the numbers to a more easily handled adjacent number (making the 29 into 30, or the 98 into 100). Most relied instead on the standard algorithms for these tasks, indicating a lack of deep understanding of number operations.

CHAPTER 4

Chapter 4 presents results for 33 measurement tasks. Averaged across 101 task components administered to both year 4 and year 8 students, 25 percent more year 8 than year 4 students succeeded with these components. Year 8 students performed better on 95 of the 101 components.

There was little evidence of change between 1997 and 2001. Averaged across 41 trend task components attempted by year 4 students in both years, 2 percent more students succeeded in 2001 than in 1997. Gains occurred on 25 of the 41 components. At year 8 level, with 45 trend task components included, 2 percent fewer students succeeded in 2001 than in 1997. Gains occurred on 15 of the 45 components.

At both levels, students were much more successful at making or reading measurements than at making good estimates of measurements. Also, many who could measure satisfactorily were not able to explain clearly their processes and strategies for making and checking their measurements.

CHAPTER 5

Chapter 5 presents results for sixteen geometry tasks. Averaged across 41 task components administered to both year 4 and year 8 students, 23 percent more year 8 than year 4 students succeeded with these components. Year 8 students performed better on all components.

There was little evidence of change between 1997 and 2001 for year 4 students, but a small decline for year 8 students. Averaged across 13 trend task components attempted by year 4 students in both years, 2 percent more students succeeded in 2001 than in 1997. Gains occurred on 10 of the 13 components. At year 8 level, with 22 trend task components included, 5 percent fewer students succeeded in 2001 than in 1997. Gains occurred on 3 of the 22 components.

Many students were able to identify the nets of three-dimensional objects and to mirror a shape in a line of symmetry. Students had less success with visualising the internal structure and cross sections of three-dimensional objects, and with other spatial relationships tasks in three dimensions.



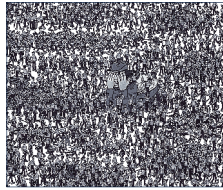
CHAPTER 6

Chapter 6 presents results for ten algebra tasks and seven statistics tasks. Averaged across 36 task components administered to both year 4 and year 8 students, 28 percent more year 8 than year 4 students succeeded with these components. Year 8 students performed better on 35 of the 36 components.

There was evidence of substantial improvement between 1997 and 2001 for year 4 students, but little change over the same period for year 8 students. Averaged across 15 trend task components attempted by year 4 students in both years, 9 percent more students succeeded in 2001 than in 1997. Gains occurred on 14 of the 15 components. At year 8 level, with 28 trend task components included, 1 percent more students succeeded in 2001 than in 1997. Gains occurred on 16 of the 28 components.

CHAPTER 7

Chapter 7 focuses on the results of a survey that sought information from



students about their strategies for, involvement in, and enjoyment of mathematics. Mathematics was the third most popular option for year 4 students and the fourth most popular option for year 8 students. At year 4 level its popularity remained constant between 1997 and 2001, but at year 8 level it was chosen by 9 percent fewer students in 2001, while technology and art gained substantially from the 1997 results.

The students' responses to eleven rating items showed the pattern found to date in all subjects except technology; year 8 students are less likely to use the most positive rating than year 4 students. In other words, students become more cautious about expressing high enthusiasm and self-confidence over the four additional years of schooling.

Between 1997 and 2001, fewer students at both year levels said that they didn't know how good their teacher thought they were at maths. This is a worthwhile improvement. A higher proportion of students at both levels believed that their teachers and parents thought that they were good at mathematics. The results for several of the rating items suggested that student enthusiasm for mathematics was static or declined slightly over the four year period.

CHAPTER 9

Chapter 9 reports the results of analyses of the achievement of Pacific Island students. Additional sampling of schools with high proportions of Pacific Island students permitted comparison of the achievement of Pacific Island, Māori and other children attending schools that have more than 15 percent Pacific Island students enrolled. The results apply only to such schools, but it should be noted that about 75 percent of all Pacific students attend schools in this category.

Year 4 Pacific students performed similarly to their Māori peers, but less well than "other" students on 45 percent of the tasks. Year 8 Pacific students performed similarly to their Māori peers, but less well than "other" students on 27 percent of the tasks.

CHAPTER 8

Chapter 8 details the results of analyses comparing the performance of different demographic subgroups. Statistically significant differences of task performance among the subgroups based on school size, school type or community size occurred for very few tasks. There were differences among the three geographic zone subgroups on 15 percent of the tasks for year 4 students, but only 2 percent of the tasks for year 8 students. Boys performed better than girls on 12 percent of the year 4 tasks and 5 percent of the year 8 tasks, but girls performed better than boys on 2 percent of the year 8 tasks. Non-Māori students performed better than Māori students on 75 percent of the year 4 tasks and 66 percent of the year 8 tasks. The SES index based on school deciles showed the strongest pattern of differences, with differences on 87 percent of the year 4 tasks and 76 percent of the year 8 tasks.

The 2001 results for the Māori/Non-Māori and SES (school decile) comparisons are very similar to the corresponding 1997 results. In 1997 there were Māori/Non-Māori differences on 80 percent of year 4 tasks and 77 percent of year 8 tasks, and school decile differences on 85 percent of year 4 tasks and 77 percent of year 8 tasks. The most noticeable, although still relatively small, changes from the 1997 results involve the gains of boys relative to girls. In 2001, year 4 boys performed better than girls on 12 percent of tasks (2 percent in 1997) and worse on none (4 percent in 1997). Year 8 boys performed better than girls on 5 percent of tasks (2 percent in 1997) and worse on 2 percent (14 percent in 1997).

