3 SUMMARY

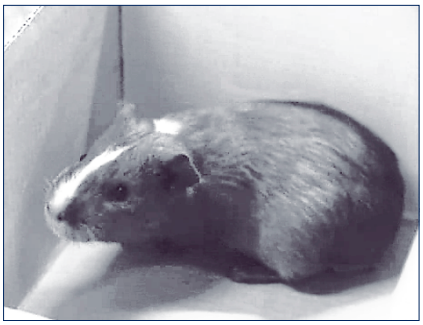
New Zealand's National Education Monitoring Project commenced in 1993, with the task of assessing and reporting on the achievement of New Zealand primary school children in all areas of the school curriculum. Children are assessed at two class levels: Year 4 (halfway through primary education) and Year 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 other physical products. Many of the responses are recorded on videotape for subsequent analysis.

The use of many tasks with both year 4 and year 8 students allows comparisons of the performance of year 4 and 8 students in 2000. Because some tasks have been used twice, in 1996 and again in 2000, trends in performance across the four year period can also be analysed.

In 2000, the second year of the second cycle of national monitoring, three areas were assessed: music, aspects of technology, and reading and speaking. This report presents details and results of the assessments of aspects of technology. Technology is a creative, purposeful activity aimed at meeting needs and opportunities through the development of products, systems or environments. Knowledge, skills and resources are combined to help solve practical problems in particular social contexts.

A framework for technology education and its assessment is presented in Chapter 2.



The framework highlights the three strands of the New Zealand technology curriculum:

- technological knowledge and understanding;
- technological capability;
- understanding and awareness of the relationship between technology and society.

Technology is a multi-disciplinary activity. To attempt to represent all or even most of the areas, meanings and applications of technology within the national monitoring assessment programme would be unrealistic. After careful examination of the scope of the technology curriculum, it was decided to assess some key aspects, with a particular focus on the knowledge, understandings and skills listed above. Selected areas of content and broadly overlapping contexts (e.g. personal, home, school, community) have been used to investigate the ideas student have and the processes they can use.

Chapter 3 examines achievement relating to technological knowledge and understanding, assessed through eight tasks. Averaged across 58 task components completed by both years, 14 percent more year 8 than year 4 students or teams produced correct or strong responses. This indicates that, on average, students have made useful progress between year 4 and year 8 in the skills and understandings assessed by the tasks.

One trend task involving a total of seven components was administered to students in both the 1996 and 2000 assessments. For year 4 students, results were very similar in 2000 to 1996, with the change from 1996 to 2000 averaging 0 percent across the seven components. For year 8 students, however, there was a marked improvement from 1996 to 2000. On average across the seven components, 12 percent more year 8 students succeeded in 2000 than in 1996. Small declines on two components involving conceptual design were more than compensated for by large gains on components involving analysis and description of materials and processes. Because only one trend task was available, this gain for year 8 students should be interpreted cautiously.

Chapter 4 examines achievement relating to technological capability, assessed through eighteen tasks. Averaged across 87 task components, 14 percent more year 8 than year 4 students or teams produced correct or strong responses. This indicates that, on average, students have made useful progress between year 4 and year 8 in the skills and understandings assessed by the tasks. Gains were generally greatest on task components requiring explanation or justification.

Seven trend tasks were administered to students in both the 1996 and 2000 assessments.

Four tasks involving a total of 42 components were administered to year 4 students. Results in 2000 were similar to those in 1996, with the 2000 students averaging 2 percent higher than the 1996 students across the 42 components. Five tasks involving a total of 50 components were administered to year 8 students. Results in 2000 were similar to those in 1996, with the 2000 students averaging 1 percent higher than the 1996 students across the 50 components.

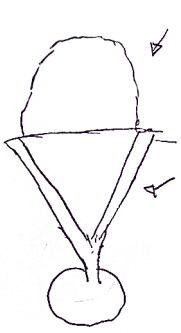
Chapter 5 examines achievement relating to technology and society, assessed through two tasks. Averaged across 12 components of the task administered to both year 4 and year 8 students, 15 percent more year 8 than year 4 students produced correct or strong responses. This indicates that students have made useful progress between year 4 and year 8 on the skills and understandings assessed by this task.

Because neither task was a trend task, results for 2000 cannot be compared to those for 1996.

Chapter 6 presents the results of the technology surveys, which sought information from students about their perceptions of their achievement and potential in technology, and about their involvement in technology related activities within school and beyond.

Year 4 students have stayed generally positive about doing technology at school, although there is a slight increase in low ratings since 1996. Eighty-five percent chose the two highest ratings for the first question (how much they liked to do technology at school), compared to ninety-three percent in 1996. Students' perceptions of their expertise in technology compared to other subjects (question 2) have also stayed quite positive, with a slight increase since 1996 in the highest rating, but also a slight increase in the lowest rating. Year 4 students reported greater use of a computer when not at school than when at school. Forty-three percent of year 4 students reported that they used a computer "most days" or "more than once a week" at school, compared to fifty-sixty percent at home.

Year 8 students have also stayed positive about doing technology at school, with 93 percent choosing a positive rating in both 1996 and 2000. More chose the very highest rating in 2000. Students' perceptions of their expertise in technology compared to other subjects were slightly more positive in 2000 than in 1996, with a 7 percent increase in the two most positive ratings. Year 8 students reported far greater use of a computer when not at school (70 percent in the top two categories), compared to when at school (47 percent).



In an open-ended question, students were asked what they thought technology was. The most popular response category, for both year 4 and year 8 students, was *Making and designing*, with very substantial increases since 1996. Year 4 student responses suggested increased overlap, from 1996 to 2000, between technology and science. The converse was true for year 8 students, who also now distinguished more clearly between technology as a subject and information technology (computers).

In another open-ended question, students were asked what sort of technology things they did in their own time. *Construction* was clearly the most popular category, with 40 percent of year 4 students and 54 percent of year 8 students making a comment in this category. The next most popular category for year 4 students was *computers* (17 percent), while for year 8 students *computers* (40 percent) and *cooking or sewing* (38 percent) came second and third.

Chapter 7 reports the results of analyses that compared the task performance and survey responses of different demographic subgroups.

School type (full primary or intermediate), school size, community size and geographic zone did not seem to be important factors predicting achievement on the technology tasks.

The other three factors revealed more substantial differences. Boys performed better than girls on two tasks (11 percent of tasks) at year 4 level. At year 8 level boys performed better on four tasks (17 percent of tasks), while girls performed better on three tasks (13 percent of tasks). Non-Maori students performed better than Maori students on ten tasks (53 percent of tasks) at year 4 level and fifteen tasks (65 percent of tasks) at year 8 level. There were statistically significant differences in the performance of students from low, medium and high SES (decile) schools on 86 percent of the year 4 tasks and 48 percent of the year 8 tasks, with students from low SES schools having the least sucess.

Chapter 8 reports the results of analyses of the achievement of Pacific students. Additional sampling of schools with high proportions of Pacific Island students permitted comparison of the achievement of Pacific Island, Maori and other children attending schools that have more than 15 percent Pacific Island students enrolled. The results apply only to such schools.

For year 4 students, there were statistically significant differences in performance among the three groups on 6 of the 19 tasks. Pacific students scored significantly lower than Maori students on one task and than "other" students on two tasks. Maori students scored significantly lower than Pacific students on one task and than "other" students on five tasks.

For year 8 students, there were statistically significant differences in performance among the three groups on 5 of the 23 tasks. Pacific students scored significantly lower than "other" students on two tasks, and Maori students scored significantly lower than "other" students on four tasks. No tasks had statistically significant differences between Maori and Pacific students.

Overall, these results suggest similar levels of performance for Pacific students, Maori students and "other" students in schools with at least 15 percent Pacific students, but with a slight tendency for the "other students" to do better.